
Chapter 16

The NDC System in Poland: Assessment after Five Years

*Agnieszka Chłoń-Domińczak and Marek Góra**

THE NEW POLISH PENSION SYSTEM, WHICH WAS INTRODUCED under the banner of “Security through Diversity,” started on January 1, 1999. It replaced all previous legislation on old-age pensions for the majority of the working population.¹ The implementation of any pension reform is a long process, and this is true of the new Polish pension system. In 2004, it was still difficult to draw lessons from the system implementation, as no pensions will be paid until 2009. However, although the general design of the system has remained unchanged, some elements remain debated in Poland. There are also some lessons from the implementation that can be drawn from the administrative perspective.

In this chapter we present the design of the NDC system in Poland in the context of the framework of the entire pension system implemented in 1999. We also present an assessment of the early Polish experiences with implementation as well as the current debate on the future of the NDC pension system in Poland.

The chapter is structured as follows. In the first section we present an overview of the new pension system in Poland. In the second section we present transition aspects, which are related to the specific design of the Polish pension system. In the third section we examine the system design from both a microeconomic and a macroeconomic perspective. The fourth section focuses on the implementation experiences. The final section summarizes the discussion and draws conclusions.

Key Features of the New Polish Pension System

Designing the new system from scratch provided the unique opportunity to create a system that can be neutral or at least close to neutral vis-à-vis economic growth and irrespective of population aging.² It also allowed for the design of a simple and transparent system

* Agnieszka Chłoń-Domińczak is deputy minister in the Ministry of Social Policy in Poland. In 1997–99 she was a core member of the team preparing and implementing the pension reform in Poland. Marek Góra is a professor at the Warsaw School of Economics. He and Michał Rutkowski were authors of the pension reform concept in Poland.

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that avoids the complications inherent in a system that has been reformed through ad hoc changes.

On January 1, 1999, the previous Bismarckian pension system based on a social tax was terminated and a new system, entirely based on individual accounts of two types, was introduced. The account types are:

- Non-financial defined contribution (NDC): individual accounts based on government quasi-bonds (an idea similar to Buchanan bonds) not traded in financial markets, and yielding a rate of return that equals the wage sum growth (GDP growth in the long run).³
- Financial defined contribution (FDC): individual accounts based on instruments traded in financial markets.⁴

It should be strongly stressed that both accounts are annuitized at the same moment and play exactly the same role within social security. The sole role of the pension system is to provide the working generations with an efficient method of income allocation over their life cycles. In particular, there is no such element in the system as a “basic state pension.” Social redistribution exists, but it has been moved out of the pension system. The minimum pension guarantee (the topping-up difference between an individual’s pension and the minimum pension level defined in the legislation) is financed from the general taxes.

The social security contribution that existed prior to reform has been split so that the portion that goes to old-age pension is a separate contribution. The contribution rate on wages is divided into 12.22 percent that goes to the NDC scheme and 7.3 percent that goes to the FDC scheme. The tax regime has been exempt-exempt-tax (EET), which means that old-age pension contributions are tax exempt, similarly income from pension savings investment, while future pensions will be taxed. This applies for both NDC and FDC.⁵ Contributions for old-age pensions are paid half by employee and half by employer.⁶

From the macroeconomic perspective, the retirement age does not play any active role in balancing the revenue and expenditure sides of the new system, though it can provide some liquidity gains in the short run. But retirement age is still important from the point of view of social policy and labor supply. For these reasons, there is a minimum retirement age of 60 for women and 65 for men in the new pension system.⁷

The pension system is a method of sharing GDP between generations. The key feature of the NDC system is the stabilization of the share of GDP being transferred to the entire retired generation (GDP^R). Technical (demographic) reserves are created in the system in order to smooth fluctuations that inevitably influence the system’s revenue and expenditure side.

From the perspective of an individual, the new system is a method of life-cycle income allocation.⁸ Within this system, old-age pension contributions are based on a fixed percent of individual earnings that create account values. The account balances in the NDC system earn a rate of return based on the growth of the sum of paid contributions. At the time of retirement, the accumulated account values are annuitized. Annuities are calculated on the basis of accumulated capital and life expectancy at the age of retirement.

Pillar terminology is often used in the area of pensions, but there can be with some confusion about definitions, as they depend on who is doing the classification.⁹ This terminology is sometimes used in Poland, especially for public communication. However, the metaphor of pillars fits the Polish case only partially. If we use this terminology we should say there is no “first pillar” at all in the system. The “second pillar” consists of two types of individual accounts (two accounts per participant: one NDC account and one FDC

Table 16.1. Alternative Approaches to Pension Reform

<i>Typical three-pillar reform</i>	<i>Polish "Security through Diversity"</i>
<ul style="list-style-type: none"> • Rationalized old system (redistribution; anonymous participation): the first pillar • New part of the system based on financial individual accounts run by private asset managers: the second pillar • Contribution split between the old and the new system • Promotion of various forms of additional savings: the third pillar 	<ul style="list-style-type: none"> • Splitting social security into old-age and non-old-age benefits • Termination of the old-age part of the old system • Creation of entirely new old-age part of the system (individual accounts of two types) • Contribution split between two accounts • First account: non-financial; rate of return determined by GDP growth; publicly run (possible privatization) • Second account: financial; rate of return determined in financial markets; privately run • Annuitization of account values (both accounts) • Promotion of various forms of additional savings

Source: Góra (2003).

account) that have the same objective (income allocation) but use different ways of generating the rate of return (the NDC through real economy and the FDC through financial markets). Table 16.1 presents a comparison of key features of the three-pillar approach and the Polish approach.

It should be stressed that the idea of implementing a completely new system was rather radical, in that it put a complete end to the old system for the vast majority of the population. Attempts to introduce numerous minor modifications into pension systems can erode public trust and even create social unrest about the future of the system more than a complete paradigmatic reform. This certainly proved to be the case for Poland. First, during the entire reform process, the reform concept was communicated to the social partners and the media, and their voices were carefully listened to. Second, the reform did not affect the oldest working cohorts, who would retire shortly after the reform. Third, the reform followed a ruling of the constitutional tribunal against additional unexpected changes in the pension system. Finally, the long-term projections were presented and explained, showing long-term threats faced by the old pension system (which was actually bankrupt). As a result, in Poland there was no significant public criticism of the new system.

Transition from DB to DC: Some Practical Aspects

Beginning January 1, 1999, the entirely new system replaced the old one for all people born after December 31, 1948. Participation in the new system was not subject to individual choice. The new system automatically covered the entire group of people born after that date. There was no switching.¹⁰ However, a group of participants (those who were born before January 1, 1969) chose one of two versions of the new system—either NDC plus FDC or only NDC. Their choices were taken in the period until December 31, 1999. Table 16.2 provides a summary of the procedure.¹¹

Table 16.2. Introduction of the New System (age groups)

<i>New system (people born after December 31, 1948)</i>		
<i>People born after December 31, 1968</i>	<i>People born before January 1, 1969</i>	<i>Old system (people born before January 1, 1949)</i>
<i>Automatically covered by the new system; OA contribution automatically split between two accounts (NDC+FDC)</i>	<i>Automatically covered by the new system; OA contribution either split between two accounts or paid into one account ([NDC+FDC] or NDC)</i>	<i>Stay in the old system (no possibility of participating in the new one); no accounts</i>

Source: Authors' analysis based on the law on the social security system.

The introduction of a new pension system from scratch required establishing the transition from the Bismarckian pay-as-you-go (PAYG) defined benefit to individual accounts (the combined NDC and FDC system). A special procedure was designed to transform pension rights into account values. Everybody who began participation before January 1, 1999, received on their NDC account an amount called "initial capital." This procedure can be interpreted as retiring the entire population born after December 31, 1948, according to the old rules on December 31, 1998. After sending all participants to this hypothetical "retirement," the old system was terminated. After January 1, 1999, everyone participated in their chosen option of the new system.

Rights acquired under the old system were then converted into initial capital in the new system. Initial capital is calculated to deliver the same pension benefit as the old system formula (adjusted for age and contribution years), if everyone had retired on the last day of the old system. There is no differentiation of initial capital between those who split their contributions between two accounts those who have only one account.¹²

The conversion of accrued rights under the old system into initial capital under the new system allows for gradual transition from the one system to the other without complex and time-consuming re-creation of hypothetical pension account values. The reformers decided to follow this path for several reasons. First, there were no individual data that could be used to retrieve the value of contributions paid before the reform. In the old pension system, the Social Insurance Institution (ZUS) received individual information only upon retirement. Because most of the individual records prior to 1980 were destroyed, this method of converting old-system rights into initial capital provided a way to deal with initial notional account status.

Second, recalculating the accrued rights to the initial capital allows smoothing the transition from the old to the new systems, keeping the incentives to work longer intact. Projections show that replacement rates in the pension system will gradually decrease as the initial capital portion of the notional account decreases.

Third, this procedure gave neither incentives nor disincentives to participate solely in the NDC scheme or in both the NDC and FDC schemes in the new system, as workers received exactly the same pension rights, regardless their choice.

The formula used to calculate initial capital follows the old system's formula,

$$P_0 = 24\%W\rho + (1.3\% T + 0.7\% N)B, \quad (16.1)$$

where:

P_0 = monthly accrued pension at the end of 1999,

T = total years of contributions,

N = other eligible years (unemployment, military service, parental leave etc.),

B = individual assessment base,

W = average, gross, economywide monthly wage in second quarter of 1998, and

ρ = adjustment factor (specific to the initial capital) equal to

$$\min\left(\sqrt{\frac{A_i - 18}{A_r - 18} \cdot \frac{C_i}{C_r}}, 1\right),$$

where

A_i = individual's age at the end of 1998,

A_r = retirement age (60 for women and 65 for men),

C_i = total eligible years at the end of 1998 (= $\text{Min}[(T + N); (4/3 T)]$), and

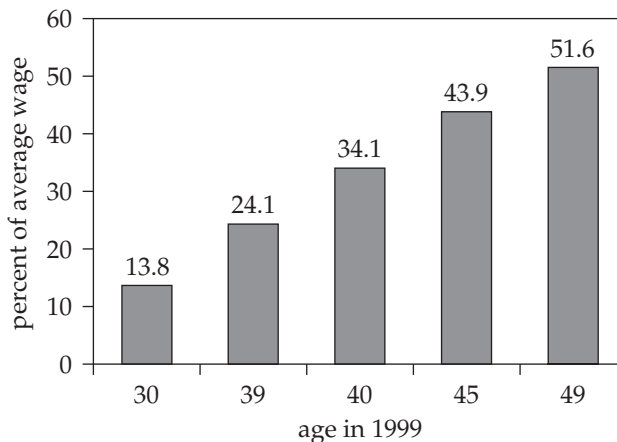
C_r = required eligible years (20 for women and 25 for men).

The individual assessment base equalled to the average individual monthly earnings over a period of 10 consecutive years of earnings after 1980 indexed for wage inflation, as follows:

- The pay in a chosen year is compared to the average, economywide wage for that year, and
- The resulting ratio, capped at 250 percent, is multiplied by the indexed figure for economywide earnings, to derive the assessment base for the averaging process.

Figure 16.1 shows an estimated value of the hypothetical pension taken for the initial capital calculation. For older workers, the value of hypothetical pension increases.

Figure 16.1. Value of Hypothetical Pension for the Initial Capital Calculation



Source: Authors' calculations.

Note: Calculated for average male wage earner who started working at age 25.

The formula for the initial capital (K_0) calculation can be defined as:

$$K_0 = P_0 \cdot G_{62}^{1998}.$$

The life expectancy (G -value) used for the calculation of initial capital was based on uni-sex life tables and used age of 62 for both men and women. In 1998, the life expectancy for a 62-year-old was 209 months; this value was used for the calculation. If G -values for 60 and 65 were used to calculate the initial capital, women with identical work history would receive 30 percent higher initial capital.

This choice of the G -value has implications for the future pension size. The contribution of the initial capital to the NDC pension (P_0^r) will be:

$$P_0^r = \frac{K_0^r}{G_{age}^r} = P_0 \cdot \prod_{i=1999}^r (1+n_i) \cdot \frac{G_{62}^{1998}}{G_{age}^r}, \quad (16.2)$$

where

n_i = notional rate of return in year i ,

r = year of retirement, and

G_{age}^r = life expectancy at retirement age and retirement year.

This shows that the value of the future pension will depend on the return yielded from 1999 until the year of retirement and the relation between the life expectancy of a retiring person and the G -value used for the initial capital calculation. In the case of the latter factor, as a result of the increasing life expectancies, the value of the denominator will be increasing. In addition, if the difference in retirement age of men and women remains—that is, women would retire at age 60 and men at 65—women will have relatively lower pension resulting from the initial capital.

The legislation gave a period of five years, until the end of 2003, to calculate the initial capital for all contributors in the new pension system. This time was needed for some 10 million workers covered by the new pension system to collect necessary information for the initial capital calculation. Despite this time, the calculation of the initial capital was not completed—less than half of eligible workers filed their documents in ZUS. It is now envisaged that the entire process should take until 2006.

Implementation of the New Pension System

In this section we focus on the outcomes from the implementation of the new pension system, from both macroeconomic and microeconomic perspectives. However, the current projections differ to some extent from those in 1998, mainly because of the development of the macroeconomic situation in Poland in recent years. Thus, we also present a short summary of the developments after 1999.

Demographic, Macroeconomic, and Pension System Developments after 1999

One of the most important reasons for the introduction of the new pension system in Poland was the aging of the population. From 1999, the aging process deepened. In particular, fertility rates fell dramatically, while life expectancies increased. In addition, the 2002 census results show that the Polish population was smaller than projected (mainly because of previously underestimated emigration flows). One of the signs of the aging of the population was the increasing life expectancies of persons at retirement age. In the period

Table 16.3. Changes in Life Expectancy of Persons at Retirement Age, 1995–2002

Life expectancy	Year							
	1995	1996	1997	1998	1999	2000	2001	2002
women age 60	20.52	19.69	19.98	20.21	20.31	20.68	20.97	21.31
men age 60	15.84	15.93	16.13	16.38	16.29	16.72	17.03	17.19
women age 65	16.55	15.77	16.03	16.26	16.34	16.68	16.93	17.25
men age 65	12.88	12.93	13.13	13.37	13.28	13.63	13.92	14.05

Source: GUS lifetables (1996–2003).

between 1998 and 2002, the life expectancy for both men and women at 60 and 65 increased by almost a year. If this process continues at the same pace, in 10 years the average time that retirees receive an old-age benefit will be more than 2 years longer than currently (table 16.3).

In 1998, when the Polish pension reform was implemented, the Polish economy was growing at a very fast pace. After 1999, the Polish economy started to slow down and only in 2003 showed signs of economic recovery. In particular, the employment level decreased: in 1999 there were 14.5 million persons working in Poland, and in 2002 there were only 13.7 million. Also the real growth of wages was quite small. The economic growth and the wage increase picked up in 2003, but growth of employment did not follow.

This drop in employment affected the financing of the pension system. Contribution revenues decreased, resulting in high deficits in the pension system. At the same time, the public finances were deteriorating and the public debt reached about half of GDP. This resulted in an increasing social security subsidy, which led some politicians to question the long-term principles of the pension reform, given the short-term problems with the state budget deficit.

From 1999 to 2002, the total number of covered workers (both under new and old pension systems) fell gradually from 13.27 million to 12.76 million, an almost 4 percent decrease (shown in table 16.4). Currently it is not possible to monitor the number of active

Table 16.4. Number of Covered Workers, 1998–2002 (thousands of persons)

Year	Total	Old system	New system: NDC	New system: FDC + NDC	Registered members in the FDC scheme ^a
1998	12,737	12,737			
1999	13,271	1,993	3,684	7,594	8,694
2000	13,060	1,749	3,570	7,741	9,973
2001	12,851	1,731	3,375	7,745	10,637
2002	12,761	1,608	3,300	7,853	10,990

Source: Authors' estimates based on Social Budget Model (The Gdansk Institute for Market Economics 2004).

a. The number of persons registered in the FDC scheme is based on the supervision (KNUiFE) registry. The difference between estimated number of covered workers and persons registered in the FDC scheme results from the accumulation of fluctuations in the workforce and covered persons. The number of registered members represents all those persons who at any point of time paid contribution and even some who actually never contributed. The number of persons with NDC and FDC accounts is based on the estimates on the number of workers who contributed to the pension system in a given year.

covered workers under new and old pension systems precisely. The only figure that can be observed is the number of persons that joined open pension funds—in 2002, almost 11 million persons were open pension fund members. The number of those who are in the NDC and FDC system is based on estimates, which are confirmed also by the fact that monthly ZUS transfers some 8 million contributions to the FDC accounts.

Moreover, over past the few years, the growth of real wages was lower than real GDP growth, a factor that also contributes to the lower amount of contribution revenues. The reduction in revenues was particularly strong in 2002, when not only real but also nominal contribution revenues dropped. Table 16.5 presents the collected contribution revenue to the social security system (including NDC, FDC and non-old age contributions) and the estimated covered wage bill relative to GDP, which has been falling since 1998.

As a result, the overall financial situation of the Social Insurance Fund (FUS) worsened. The level of state budget subsidies to FUS relative to GDP increased, which is shown in figure 16.2. It should be noted that, contrary to the actual outcome, the projections made in 1998 assumed a reduction of state budget subsidies in the years following the pension reform.

These developments, though not a result of the implementation of the NDC and FDC system, had some implications for the implementation. First, the notional rate of return has been relatively low, reflecting the decrease of the covered wage bill shown above. Second, the planned size of technical reserves (the Demographic Reserve Fund, or FRD) was reduced by the government. Initially, the FRD was expected to receive a transfer representing one percentage point of the wage bill annually from 2001 to 2008. However, the government decided that this flow should be reduced to 0.1 percentage point in 2001 and 2002 and then increased by 0.05 percentage points annually until 2008. As a result, the planned transfer of 1 percent of GDP to the FRD has not materialized and the balance of the FRD at the end of 2003 was only 0.6 percent of GDP.

Also, according to the revised projections of the pension system, it is highly unlikely that the system would generate financial surpluses prior to 2010, which was expected when the pension reform was introduced.

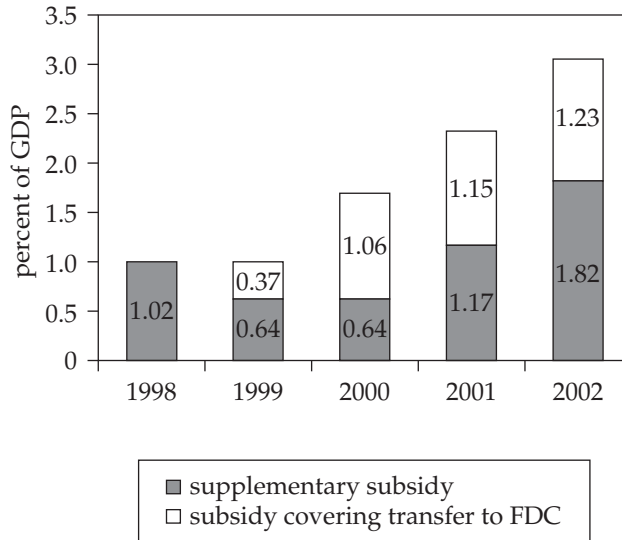
**Table 16.5. The Collected Contribution Revenue and Covered Wage Bill
As a percent of GDP**

<i>Year</i>	<i>Collected contribution revenues^a (as percent of GDP)</i>	<i>Estimated covered wage bill (wages plus contributions)^b (as percent of GDP)</i>
1998	11.35	36.56
1999	10.79	36.27
2000	10.26	34.48
2001	10.47	35.20
2002	10.07	33.85

Source: Chłoń-Domińczak (2004).

Note: The estimates include contributions paid by employees and self-employed, as the latter could not be separated from the total contribution revenue.

a. The collected contribution revenue covers all contributions paid for social security purposes (including old-age and non-old age); b. The covered wage bill includes all wages and contribution paid by employers to social security institution. This information is fully comparable in time.

Figure 16.2. State Budget Subsidies to Social Insurance Fund

Source: Authors' calculations based on ZUS and GUS data.

Microeconomic Effects of the Polish Pension Reform

Looking at the microeconomic effects of the pension reform, two issues need to be taken into account. First, the old pension system was in actuarial deficit—promised benefits were higher than revenues in the long run. Introducing the NDC system and keeping constant contribution rates means that the level of benefits relative to wages should decrease. This effect was strengthened by imposing an implicit tax of 25 percent on the NDC interest rate, reducing its size below neutrality, so that it was set at the consumer price index (CPI), increased by 75 percent of the covered real wage fund growth. This tax was levied in 2004, when the parliament increased indexation of notional accounts to full covered wage fund growth.

Second, the NDC pension formula, which is actuarially neutral, creates significant differences in the size of pension for people retiring at different ages—and, as already mentioned, retirement ages for men and women are different in the Polish pension system. If such a difference remains in the future, pensions of men and women will differ significantly.

INDIVIDUAL PENSIONS IN THE NEW SYSTEM: POLITICAL DEBATE AND POSSIBLE CHANGES

Simulations of individual pensions in the new system show that under current conditions, a woman who started to work in 1999 at age 25 and who retires at age 60 can expect a benefit (sum of NDC and FCD benefits) that represents around 40 percent of her final income, while a man who retires at age 65 can expect a pension representing almost 60 percent of his final income (table 16.6). In the case of older workers, the expected value of their benefits measured in relation to their final wage is higher. This reflects the impact of initial capital on future pensions.

Based on the projections of future pensions and replacement rates, the Polish government proposed two changes to the pension system. The first one was to increase the rate of return on NDC accounts to 100 percent of covered wage fund growth, measured by the growth of the contribution sum. As a result, future pensions should increase. However, as shown in table 16.6, the increase is higher when retirement age is 65 and relatively smaller for persons retiring at the age of 60.

Because of the discrepancy of benefit amounts due to men and women, the Polish government was reconsidering the equalization of retirement ages of men and women at 65 years. A proposal to equalize retirement ages for men and women was included in the package for public finance reform in October 2003—presented in the Green Book “Rationalisation of Social Expenditure in Poland.” All proposals presented in the Green Book were subject to discussion with experts, social partners, and NGOs. The initial proposal included a gradual increase of the retirement age of women, to begin in 2009 (that is, from the year when the first pensions from the new system are paid) and to be completed by 2018.

The discussion on equalizing the retirement age in Poland is quite difficult. The society in general is in favor of an earlier retirement age for women. The results of public opinion polls conducted at the end of 2003 show that 51 percent of the society prefers the existing solution (retirement at age 60 for women and at 65 for men). On the other hand, more than one-third favors solutions that lead to a flexible retirement age between 62 and 65. The vast majority (85 percent) of persons surveyed did not approve of the proposal for equalizing retirement ages at the age of 65, while only 5 to 10 percent supported it. However, almost 35 percent of women would agree to work longer if it would mean a higher future pension.¹³

In February 2004, the government, following the consultation process, recommended preparing for the change that would equalize retirement ages of men and women by 2023 and, at the same time, introduced the possibility of drawing a partial pension starting at the age of 62. At the end of February 2004, the proposal was presented to trade unions, employers’ organizations, and NGOs for consultations. Despite the objections of the social

Table 16.6. Simulations of Replacement Rates for Different Cohorts, both Men and Women, Depending on Retirement Age and Taxation of NDC Returns (percent of final wage)

Age in 1999	Notional rate of return 75 percent of wage bill growth		Notional rate of return 100 percent of wage bill growth	
	retirement at age 60	retirement at age 65	retirement at age 60	retirement at age 65
25	42.7%	59.5%	45.9%	64.5%
30	46.1%	62.3%	50.8%	69.2%
35	47.7%	63.3%	52.7%	70.8%
40	49.4%	64.6%	54.4%	72.1%
45	51.6%	66.4%	56.1%	73.5%
49	53.8%	68.3%	57.4%	74.6%

Source: Authors’ calculations.

Note: Simulations for average wage earner starting work at the age 25 and assuming average real wage growth of 3 percent per annum, average funded tier rate of return of 4 percent per annum and up-front fee on funded system at 5 percent, and also assuming constant employment level (that is, average wage growth = wage bill growth) and constant life expectancies. Replacement rate is calculated net of social security contributions.

partners, a draft law was submitted to the parliament in April 2004. In May 2004, the new Belka government withdrew from this proposal.

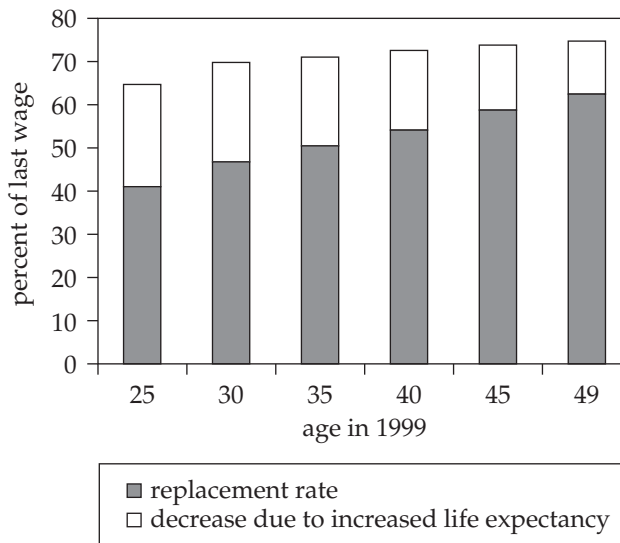
Both of the proposed changes should lead to an increase in the future replacement rates of pensioners. The idea of increasing the NDC rate of return, however, would also result in an overall increase of the level of expenditure, though the long-run macroeconomic balance of the pension system is maintained.

The discussions in Poland show that, though initially designing the pension system was based on the economic principles leading to reaching macroeconomic stability, with time some elements are being revisited—both from an economic and from a political perspective. In sum, the pension system is still a subject of political debate.

INDIVIDUAL PENSIONS IN THE NEW SYSTEM: THE IMPACT OF DEMOGRAPHIC CHANGES

The simulations presented above assume constant life expectancies at the level of 2002. Further increases in life expectancy will have an impact on future pensions. Figure 16.3 shows the results of the simulation of the replacement rates in the case of a person retiring at age 65 under the scenario when life expectancy at age 65 increases by a quarter of the year each year (that is, linearly following past years' trend). Not surprisingly, the “demographic price” is highest for youngest cohorts—in the scenario for those aged 25 in 1999, the pension size might be lower by more than one-third than it would be in the scenario with constant mortality.

Figure 16.3. Change in Pension Value Because of Increases in Life Expectancy



Source: Authors' calculations.

Note: Simulations are for an average wage earner starting work at age 25 and retiring at age 65, and assuming average real wage growth of 3 percent per annum, an NDC rate of return equal to 100 percent of wage bill growth, an FDC rate of return of 4 percent per annum, and an up-front fee on the funded system of 5 percent, and also assuming a constant employment level (that is, average wage growth = wage bill growth), assuming increases in life expectancy of one-quarter of a year each year. Replacement rate is calculated net of social security contributions.

This simulation shows how strongly changes in mortality and longer lives on retirement affect the pension system. Under traditional DB schemes, adjustment to mortality changes is subject to political decision on changing some of the parameters of the pension formula, otherwise increases in contribution rate are necessary.

Under DC schemes, this shows that in the future people's working lives need to be extended in order to offset the demographic improvements. Seen in this light, retirement ages should become a topic for discussion in Poland.

Macroeconomic Effects of the Polish Pension Reform

The implementation of the new system means an ex ante adjustment of the flow of its future expenditure. This produces very strong macroeconomic effects. Almost 500 billion euros (in 2000 prices) is the value of debt that will not be avoided until 2050 because of implementing the new old-age pension system.¹⁴ Table 16.7 provides demographic dependency ratio projections for selected OECD countries, and pension expenditures and primary surpluses needed to keep debts at their 2000 levels. In comparison with the projections made for other countries, the Polish case looks really very strong. The lack of a large part of the pension debt—and hence the absence of a need to finance its servicing—will give a great deal of freedom to both the public and private sector to achieve various goals contributing to the country's development.

Two conclusions on the Polish case can be drawn from the projections provided in table 16.7. First, the demographic situation (measured by the dependency ratio) will change from relatively good at present to one of the worst in the OECD in 2050. Second, at the same time—because of the implementation of the new system—old-age pension expenditure will substantially drop from its current rate as one of the highest to one of the lowest in the OECD area in 2050. Calculations provided in the table did not take into account the change in the NDC account indexation made in 2004. As a result of this change, the overall pension expenditure will be slightly higher than the provided projections.

Table 16.7. Projected Effects in Poland Compared with Projections in Selected OECD Countries

Country	Dependency ratio			Pension expenditure (percent GDP)			Required primary surplus (percent GDP)	
	2000	2050	Change	2000	2050	Change	Debt constant	Debt reduced
France	27.2	50.8	23.6	12.1	15.8	3.7	5.9	6.6
Germany	26.6	53.2	26.6	11.8	16.9	5.1	4.3	4.7
Italy	28.8	66.8	38.0	14.2	13.9	-0.3	4.9	5.9
Poland	20.4	55.2	34.8	10.8	8.3	-2.5	-1.0	-1.0
Spain	27.1	65.7	38.6	9.4	17.4	8.0	4.8	5.2
Sweden	29.4	46.3	16.9	9.2	10.8	1.6	1.0	1.1
United Kingdom	26.6	45.3	18.7	4.3	3.6	-0.7	0.8	1.2
United States	21.7	37.9	16.2	4.4	6.2	1.8	2.7	3.2
OECD (average)	23.8	49.9	26.1	7.4	10.6	3.2	—	—

Source: Dang, Antolin, and Oxley (2001).

Note: — = not applicable. If only pension expenditure is taken into account, then the required surplus needed in the case of Poland is even more favorable (-2.8 percent of GDP). A negative primary surplus means the debt will not explode even if a country runs a deficit.

The shift to the NDC system in Poland allows for controlling total pension liabilities. In the traditional DB system, measuring the implicit pension debt depends on the methodology that can be used. In the NDC system, the total value of pension accounts is equal to the value of pension liabilities, in a way similar to the total assets accumulated in the FDC scheme. Keeping future pension liabilities under control is important because of the accelerated aging that is expected in Poland.¹⁵

A more detailed future outlook of the macroeconomic performance of the NDC system can be drawn from long-term projections prepared by in the Social Insurance Institution (ZUS). The ZUS is obliged to prepare annual projections of the long-term revenue and expenditure for old-age pensions. The aim of the projections is to prepare the strategy for managing the Demographic Reserve Fund. The first projection was published in 2003, the second in 2004. The projection, accompanied by the opinion of the independent actuary, is submitted to the Council of Ministers. In this chapter we present the results of the 2004 projection.¹⁶

The demographic forecast used for this projection shows that the number of people of postproductive age is likely to double within the next half of the century. In addition, the number of persons of productive age is going to decrease by one-third. The demographic dependency ratio is going to increase by half (table 16.8).

To test the sensitivity to the assumptions, the results were calculated under three different macroeconomic scenarios: *baseline*, *pessimistic* (in the sense of a harder burden put on the social security system), and *optimistic*, shown in table 16.9.

Table 16.8. Demographic Assumptions (baseline scenario)

Population cohort	2002 census	Projection				
		2010	2020	2030	2040	2050
Total population (millions)	38.2	39.0	39.4	38.5	36.8	35.0
men (millions)	18.5	18.9	19.1	18.7	17.9	17.0
women (millions)	19.7	20.1	20.2	19.8	19.0	18.0
Life expectancy from birth						
men	70.3	72.0	74.2	75.6	77.0	78.5
women	78.4	79.4	80.7	81.9	83.2	84.7
Life expectancy						
65-year-old man	14.3	14.7	15.4	16.1	17.0	17.9
60-year-old woman	22.1	22.7	23.6	24.5	25.6	26.8
Preproductive age (million persons)	8.9	7.4	7.7	6.9	5.8	5.6
men (0–17) (millions)	4.5	3.8	3.9	3.6	3.0	2.9
women (0–17) (millions)	4.3	3.5	3.7	3.4	2.8	2.7
Productive age (millions)	23.6	25.2	23.3	22.1	20.8	17.8
men (18–64) (millions)	12.1	13.2	12.4	11.7	11.2	9.7
women (18–59) (millions)	11.5	12.0	10.9	10.4	9.5	8.1
Postproductive age (millions)	5.7	6.4	8.4	9.5	10.3	11.6
men (65 and more) (millions)	1.8	2.0	2.8	3.4	3.7	4.4
Women (60 and more) (millions)	3.9	4.4	5.6	6.0	6.6	7.2
Demographic dependency ratio	0.62	0.55	0.69	0.74	0.78	0.97

Source: Mazur (2004).

Table 16.9. Macroeconomic Assumptions

	2002	2010	2020	2030	2040	2050
CPI (rate)	1.9%	2.0%	2.0%	2.0%	2.0%	2.0%
Real GDP growth	1.4%	5.0%	5.0%	4.0%	3.0%	2.1%
Unemployment rate						
<i>Baseline</i>	20.1%	14.8%	10.0%	7.1%	6.4%	6.0%
<i>Pessimistic</i>	20.1%	19.2%	12.2%	10.0%	10.0%	10.0%
<i>Optimistic</i>	20.1%	12.2%	7.8%	6.0%	5.1%	4.5%
Real net wage growth						
<i>Baseline</i>	1.53%	2.0%	1.5%	1.0%	1.0%	1.0%
<i>Pessimistic</i>	1.53%	1.0%	1.0%	0.5%	0.5%	0.5%
<i>Optimistic</i>	1.53%	2.5%	2.5%	2.5%	2.0%	2.0%

Source: Mazur (2004).

The results of the projection for all scenarios are presented in table 16.10. These include revenues, expenditures, and one-year balance of the old-age scheme (including both old and the NDC systems) measured in relation to the GDP, as well as number of covered workers (again both under new and old systems), number of pensioners (old and new systems together), and resulting system dependency ratio.

More detailed results of the baseline scenario are presented below. Figure 16.4 shows projections of the reciprocal dependency rates. Because of the aging of the Polish population, between 2002 and 2050 the ratio of the number of people in the productive age (18–59/64) to the number of people in the postproductive age (60+/65+) is expected to decrease from the level above 4 to around 1.5. These developments, however, will not be initially reflected in the system dependency rates. The relation of the number of workers to the number of old-age pensioners is expected to increase until 2014. The projected increase is caused by a projected rise in the number of insured (discussed below), as well as by a reduction in the number of old-age pensioners that will occur as a result of eliminating early retirement options. In the second decade of the century, the trend will reverse, following the demographic developments.

Taking into account all pensions (disability and survivor pensions as well as old-age pensions), the system dependency rate follows a similar pattern. By the end of the projection period (2050), the system dependency rates and the demographic dependency rate are likely to converge.

The projected development of dependency rates follows the projected changes in the number of pensioners and insured. The number of pensioners is expected to increase until the end of 2006 (when the retirement under the old system expires). Between 2007 and 2012, the number of old-age pensioners will be decreasing, as there will be very little inflow of new old-age pensioners—most of those retiring under the old system are going to retire at an early age before the end of 2006, and the pensioners in the new system can retire only from 2009 (women) and 2013 (men), when they reach retirement age. After 2012, the number of old-age pensioners will increase, following the aging process. According to the projection results, the number of other pensioners (disability and survivor) is also going to increase, but not that significantly (see figure 16.5).

The stock of pensioners distinguished by their participation in the old or new pension system is presented in figure 16.6. During the next couple of decades, the majority of the old-age pensioners will be receiving pensions under the old system regulations. After

Table 16.10. Projection's Results

<i>Scenarios</i>	<i>2002</i>	<i>2010</i>	<i>2020</i>	<i>2030</i>	<i>2040</i>	<i>2050</i>
<i>Baseline</i>						
Revenues*	9.2%	8.2%	6.0%	4.1%	3.1%	2.3%
of which contributions*	8.7%	8.0%	5.9%	4.1%	3.1%	2.3%
Expenditures*	12.7%	9.9%	7.3%	5.0%	3.6%	2.7%
One-year balance*	-3.5%	-1.7%	-1.3%	-0.9%	-0.5%	-0.4%
Covered workers (million)	12.9	14.9	15.5	15.2	14.3	12.6
Pensioners (old-age and other pensions) (million)	7.5	7.1	7.9	8.5	8.9	9.5
System dependency ratio	0.58	0.48	0.51	0.56	0.62	0.75
<i>Pessimistic</i>						
Revenues*	9.2%	7.3%	5.1%	3.2%	2.3%	1.7%
of which contributions*	8.7%	7.1%	5.0%	3.2%	2.3%	1.7%
Expenditures*	12.7%	9.7%	6.9%	4.6%	3.3%	2.4%
One-year balance*	-3.5%	-2.4%	-1.8%	-1.4%	-1.0%	-0.9%
Covered workers (million)	12.9	14.2	15.2	14.8	13.9	12.2
Pensioners (old-age and other pensions) (million)	7.5	7.1	8.0	8.7	9.6	10.4
System dependency ratio	0.58	0.50	0.53	0.59	0.69	0.85
<i>Optimistic</i>						
Revenues*	9.2%	8.7%	6.8%	5.3%	4.4%	3.6%
of which contributions*	8.7%	8.4%	6.8%	5.2%	4.3%	3.6%
Expenditures*	12.7%	9.9%	7.5%	5.5%	4.3%	3.4%
One-year balance*	-3.5%	-1.3%	-0.7%	-0.2%	0.1%	0.2%
Covered workers (million)	12.9	15.2	15.9	15.4	14.5	12.7
Pensioners (old-age and other pensions) (million)	7.5	7.1	7.8	8.4	8.8	9.3
System dependency ratio	0.58	0.47	0.49	0.54	0.61	0.73

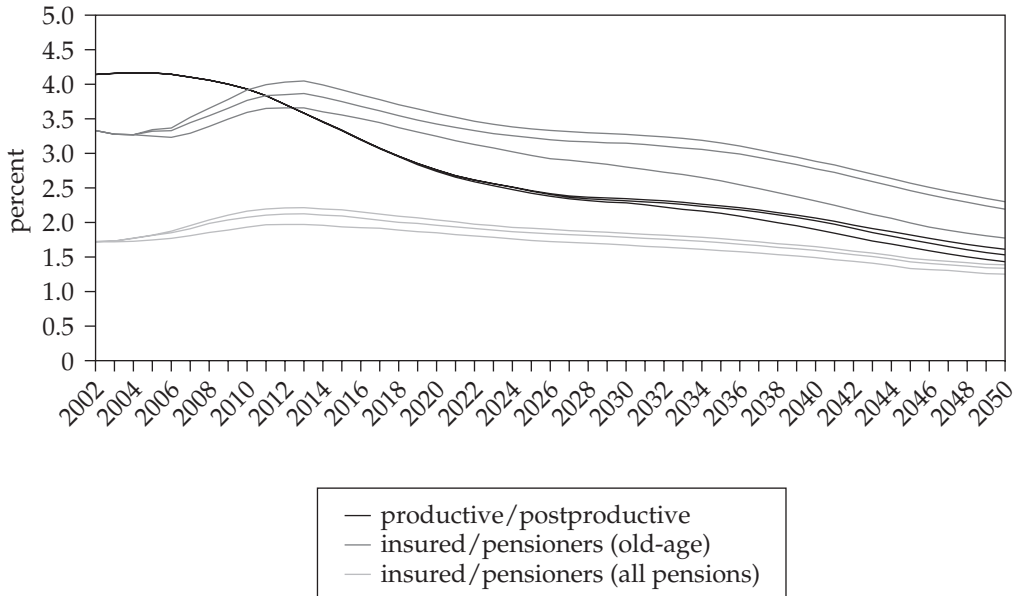
Source: Mazur (2004).

Note: An asterisk denotes percent of GDP.

2020, the share of new system pensioners will be increasing; by 2050, almost all pensioners will be drawing pensions under the new pension system (though some of them will be drawing only from an NDC account).

The development in the number of covered workers is presented in figure 16.7. Following the demographic trends and projected changes on the labor market as well as increases in retirement age, the number of covered workers is expected to increase over the course of the next decade. Afterward, because of the aging process, the number of covered workers will decrease. In time, the difference between the number of people who have two accounts (NDC and FDC) and total number of covered workers will diminish. According to the projection, by 2025 the vast majority of covered workers will participate fully in the new combined system.

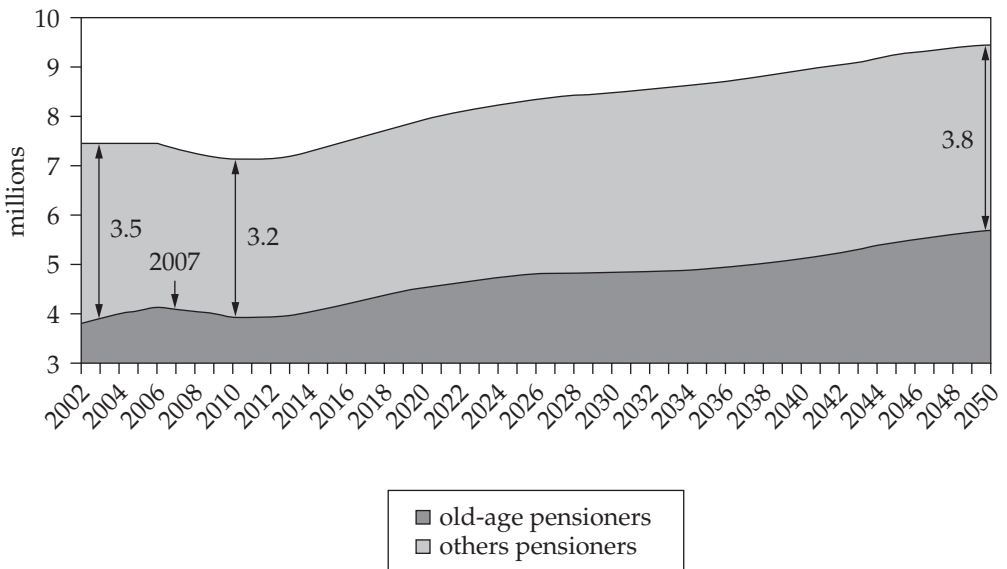
Figure 16.4. Demographic and System Dependency Rates, 2002–50



Source: Mazur (2004).

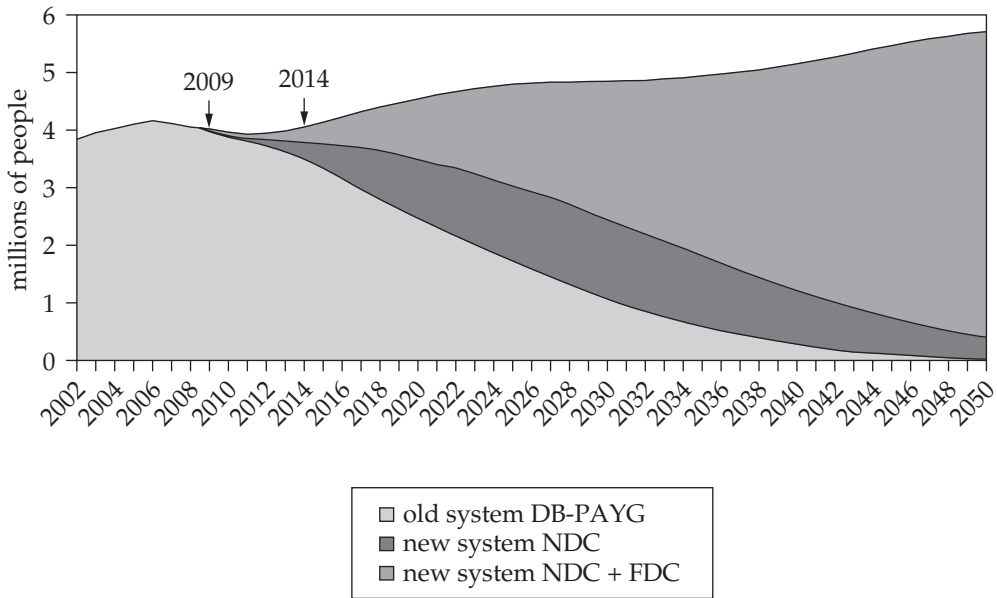
Note: These projections are for three various demographic scenarios: baseline, higher fertility, and lower mortality.

Figure 16.5. Number of Pensioners, 2002–50



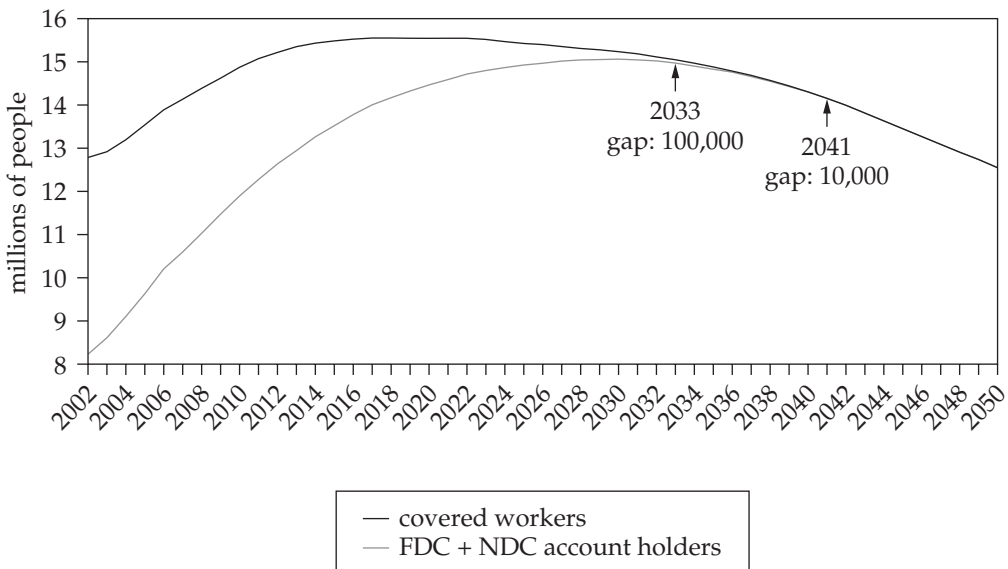
Source: Mazur (2004).

Figure 16.6. Pensioners Distinguished by Participation in the Old or New System, 2002–50



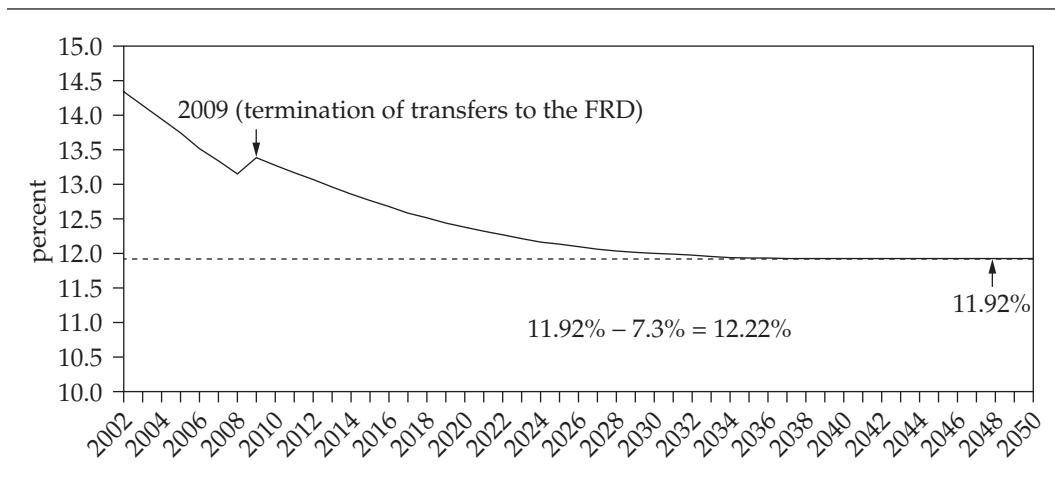
Source: Mazur (2004).

Figure 16.7. Covered Workers: Total and Those with NDC and FDC Accounts, 2002–50



Source: Mazur (2004).

Figure 16.8. Non-Financial Scheme Contribution Revenues (Old System and NDC), 2002–50 (% of covered wage bill)



Source: Mazur (2004).

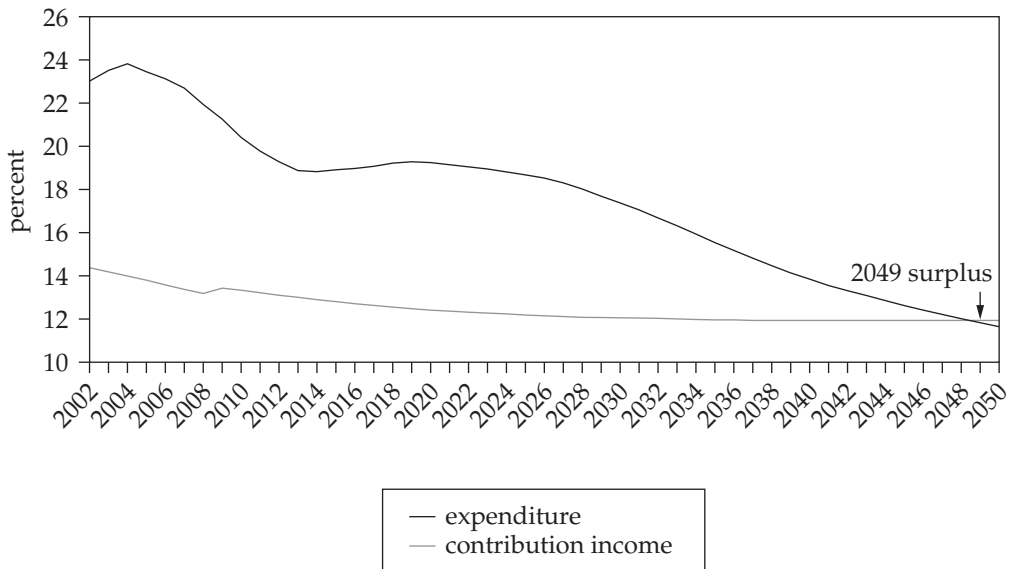
Figure 16.8 presents the projected value of contribution revenues to the non-financial part of the pension system expressed in relation to the covered wage bill. The projection also takes into account the collection rate. At the beginning of the projection, as not all covered workers have FDC accounts, the contribution revenues to the non-financial scheme are higher. In time, when the share of covered workers with FDC accounts increases, the contribution revenues will reach 11.92 percent (reflecting the contribution rate for NDC account adjusted for projected collection level).

According to the projection, the expenditures of the pension system will be decreasing sharply after 2006, reflecting the reduction in the number of pensioners (figure 16.9). After 2014, expenditures will increase slightly, following demographic developments and the increase in the number of old-age pensioners from the post-war baby boom generation. In the 2020s, the expenditures will go down again, as most of the pensioners retiring at that time will have part of their pension paid already from the FDC account. Under the baseline macroeconomic assumptions, the system's deficit should gradually reduce and it should reach a surplus at the end of the projection period (in 2049).

Early Experiences with Implementation

Management of the pension system is an issue that needs careful consideration when designing the system. However, management of the system should not be confused with the system itself. Implementing the new pension system was a complex task, and the number of institutions involved in the day-to-day operations of the pension system and their responsibilities increased. Box 16.1 summarizes the most important key Polish institutions in the reform and their tasks under the new pension system.

The introduction of individual accounts is a technological and operational challenge. In individualized pension systems there are many processes that need to be recorded. The most important is the collection and assignment of the payments. All other processes (registration, transfers, and so on) support the main process. However, these supportive

Figure 16.9. Pension System Revenue and Expenditure, 2002–50 (% of covered wage bill)

Source: Mazur (2004).

Note: Expenditure of the pension system covers both the old pension system and the NDC pensions.

processes still have to meet quality standards to ensure the proper assignment of payments. Thus sufficient time should be allowed between completing the legislation and implementing the pension system. An NDC system is very demanding for social security administrators, as individual accounts need to be kept for all insured people, not only for pensioners.

Establishing and running individual accounts requires sophisticated information systems. The quality of the systems depends on the quality of inputs provided by employers and the social security administration. Later on, particular elements of the system need to be serviced by various institutions.

The old pension scheme itself requires relatively simple information. It can be run using only four pieces of information:

- For whom the contribution has been paid (identification of employee and employer),
- How much has been paid (amount),
- When the contribution was paid (date), and
- Wage base (control variable).

The pension reform in Poland was implemented very quickly, without sufficient time to prepare for managing the new system. As a result, adapting to the new administrative requirements that were imposed by the new pension system was initially chaotic, leading to many implementation problems. Delays in implementing the IT system as well as new reporting requirements for employers created a lot of room for possible errors.

In order to establish individual accounts, all individuals and employers had to be properly identified. All documents related to social security contribution payments had to

Box 16.1. Tasks and Managing Institutions

Registration and other initial procedures	ZUS, employers
Collection of contributions	ZUS
Transfer of contributions to OA individual accounts and NOA parts of social security	ZUS
Running NDC accounts	ZUS
Running FDC accounts	PTE (private)
Providing NDC annuities	ZUS
Providing FDC annuities	Annuity companies (private) ^a

Source: Authors' analysis.

Note: ZUS = Social Insurance Institution; PTE = pension fund society (asset manager)

a. This element of the institutional structure serving the pension system still needs more legislation.

include appropriate ID numbers. As determined during the prereform preparation, the existing ID numbers in Poland fulfilled the most important requirements:

- They are unique (that is, no two individuals or employers can have the same number), and
- They are common (that is, all individuals and employers have such ID numbers).

However, upon implementation it turned out that there were many problems with identifying both individual workers and employers. First, problems resulted from wrong information provided in registration documents. Second, banks were introducing errors in the transfer documents, so many of the identification numbers were incorrect. Finally, it turned out that some of the employers with regional networks were misusing their tax identification numbers by using them also for social security purposes. Specifically, all regional branches were using the same number, though they represented different payers. As a result, contributions could not be properly assigned.

During the initial phase of implementation, the majority of the new social security documents were sent to ZUS in paper form. The software supporting electronic processing was not fully developed. However, with time the quality of the software improved. Also, the law was amended to require the majority of employers to send information electronically. As a result, the quality of the information improved significantly.

Between September 2001 and December 2003, the overall accuracy of the information increased from 71.14 percent to 98.09 percent. The largest improvement in the accuracy of the information has been observed in two fields: (1) the identification of employees and (2) formal control (including such elements as amount of contributions due for each type of risk from employees and employers, and type of employment contract). It has to be noted that much of this improvement is a result of increased control of documents, which was accommodated by a 20 percent increase in the number of employees at ZUS between 1999 and 2003 (from 40,000 to 48,000 employees).

In 2003, ZUS straightened out all individual accounts and was able to send individual reports on contributions paid in 2002. The reports were sent at the end of the year 2003 and the beginning of 2004. This is a big step toward full individualization of contribution payments. However, there is still not full information on individual accounts, which can be distributed only after reconciliation of contributions paid between 1999 and 2001. This means that insured workers still do not receive their annual account statements.

The new system financing is based on accrual accounting. The Social Security Institution, prior to the start of the new system, did not use accrual accounting and individualized contribution. Implementing these elements, combined with the delays in implementing the IT system, created the delays in the full establishment of the NDC accounts for workers. Information technology implementation has been the curse of more than one new public policy initiative.

Conclusions

The new pension system in Poland reshaped the traditional perception of how the pension system can provide people with social security. As a result, Poland belongs to a small group of countries that are prepared for one of the most difficult challenges of our time—the aging of the population.

In the future, expenditure on old-age pensions will not only stop increasing, but also the overall expenditure will fall in relation to GDP. This will leave more resources available for development, which, in turn, will contribute to stronger growth and the increase of living standards for both the working and the retired generations.

The example of the new Polish pension system in the NDC framework is interesting for yet another reason. This type of system contributes to labor mobility, which is particularly needed in Europe. Free movement of labor cannot be achieved if moving from one country to another affects expected retirement income. As such, aiming at pension system neutrality will be more and more important for European integration.

Finally, the system allows pension liabilities to be monitored. This is particularly important, as public liabilities play an important role in the perception of the shape of the public finances. Introducing pension reform in Poland helped to reduce the level of the implicit pension debt, creating additional room for economic growth.

As far as administrative implementation goes, the lessons from the Polish experience teach us that one should never underestimate the technology and complexity of transactions in the individualized system. Efforts directed toward resolving these issues can save time and money in the future. On the other hand, delaying implementation of pension reform is also a risk. First, the window of political opportunity can be closed; second, the longer the implementation of a neutral pension system is delayed, the higher the pension debt to be paid back in the future will be.

Notes

1. The new system covered workers born after 1948—that is, persons less than 50 years old when the reform was introduced.

2. For more extended descriptions of the pension system in Poland see Góra (2003c); Chłoń-Domińczak (2002); Chłoń, Góra, and Rutkowski (1999); and Góra and Rutkowski (1998).

3. Until recently there was a 25 percent tax on returns yielded on account values in NDC accounts; this tax was removed in 2004.

4. There are no tax on returns on FDC accounts at the moment.

5. In order to avoid reduction of the net wages, all wages were grossed-up from 1999, adding the amount equal to the contribution due from the employee to the wage.

6. Before, only employers paid the contribution. The non-old age part of the contribution amounts to 17.07 percent of wage.

7. The initial reform project set retirement age at 62 for both men and women. For political reasons this was not accepted in 1998. In 2004, the government presented a draft law to

the parliament that proposed to equalize the retirement age at 65 for men and women by 2023; after public discussion, the government withdrew the proposal.

8. See Góra and Palmer (2004).

9. For instance, the “second pillar” can be a part of the universal system (World Bank terminology) or it can refer to occupational (partial) schemes (terminology used in many countries).

10. Offering people the opportunity to take decisions is usually well received. However, the idea of a universal system means not only universal coverage but also universal rules. Choice is to some extent an illusion in a mandatory system. Choice is appropriate for voluntary partial programs, not for mandatory universal ones.

11. Farmers are covered by a special pension scheme, heavily subsidized by the state budget. The so-called uniform services (army and police) were covered by the new universal system, but that concerned only those who started their service after December 31, 1998, while the rest of this group stayed with their special pension scheme. The current government decided to move all military workers back to the old system. This provides a dangerous precedence that should by no means be followed in the future.

12. This was not the case, for example in Hungary, where acquired rights were reduced for those who decided to switch to a funded pillar.

13. Results of surveys conducted in October and December of 2003 on the representative sample of Poles aged 15 and over.

14. For details on projections, see Chłoń-Domińczak (2002).

15. In 1999, the estimated value of the accrued pension liabilities represented some 120 percent of GDP, of which two-thirds belonged to persons covered by the new pension system. Between 1999 and 2002, the estimated value of contributions accumulated in the NDC was equal to some 21 percent of GDP, while the value of the pension assets in the FDC at the end of 2002 was around 4 percent of GDP.

16. The methodology of the model is described in Mazur (2004).

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