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The Latvian NDC Scheme: Success Under a Decreasing Labor Force

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Abstract: Latvia introduced a nonfinancial defined contribution (NDC) scheme in 1996 as it transitioned to a market economy. Despite a 20 percent decline in the working-age population from 1994–2016, the ratio of contributors to old-age pensioners rose from 1.6 to 2.1 given a steady increase in formal labor force participation and 5–6 percent real per capita wage growth. Projections show that long-term financial balance will be maintained through 2070, despite the threat of a projected 50 percent decline in the working-age population. Budgeted reserves will cushion the continued transition into a two-pillar public pension scheme. Latvia’s most important long-term policy challenge is to create the domestic investments and economic growth to reward younger workers for remaining in the country.

Key words: Pensions, NDC, Pension Policy, Pension Reform, Formal Labor Force

JEL codes: H55, D78, J26

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Abbreviations and Acronyms

ARR	Average Replacement Rate
EU	European Union
FDC	Financial Defined Contribution
NDC	Nonfinancial Defined Contribution
TRR	Theoretical Replacement Rate
SPA	Standard Pension Age

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1. Introduction

Prior to gaining its independence in 1990, Latvia was a state within the Soviet Union; as such its economy was integrated into the Soviet economy. The Soviet pension system Latvia inherited in 1990 was financially unsustainable and inappropriate for a market economy. The pension age was 55 for women and 60 for men, but the many exceptions based on special rights effectively reduced these to significantly lower ages. The issue of special rights for selected groups presented a challenge to fairness and the low exit ages worked against affordability and long-term sustainability.

The number of persons for whom contributions were being paid fell by almost 50 percent between 1990 and 1994, while the ratio of pensioners to contributors increased by 67 percent (Fox and Palmer 1999). A new government took office in 1993; in early 1995 it decided to introduce a nonfinancial defined contribution (NDC) scheme – to be supplemented later with a financial defined contribution (FDC) scheme, and with a minimum income guarantee for old-age pensioners. The Latvian NDC scheme was implemented, with a minimum guarantee at the floor of the system, on January 1, 1996, accompanied by a process to phase out the various special rights regimes. With the equalization of rights earned by contribution of a given amount, the Latvian pension system began to progress toward a universal public pension scheme, with the same rules applying to all. This process included the equalization of pension ages to age 65 for both men and women, to be fully achieved by 2025.

Personal accounts constitute the basic building block of NDC pension schemes. The use of individual accounts means that pensions are an individual responsibility: defined contribution pension schemes directly relate individuals' contributions and account values to their own pensions. With the implementation of NDC in 1996, Soviet workbook logs

constituted the basis for creating initial capital based on acquired rights prior to 1996.¹ Employees and the self-employed paid earnings-based contributions into the NDC scheme. The initial NDC contribution rate was 20 percent in 1996.

When Latvia introduced its FDC scheme in 2001, the overall contribution rate of 20 percent was shared between the NDC and FDC components. Since 2017 the division has been 14 percent for the NDC and 6 percent for the FDC scheme. Together with a minimum pension, the mandatory NDC and FDC schemes constitute the overall universal public system, with the same rules for all. In addition to the public schemes, it is possible to contract private individual and occupational pensions, although these are yet to become prominent components of the overall pension landscape.

Social policy is pursued in the context of NDC through “add-ons” to individual accounts. Since these are not supported by contributions from individuals themselves, they are financed with tax revenues from the state budget or other special social insurance budgets designated for this purpose. The Latvian NDC contains a number of public policy add-ons. Examples are contributions granted and paid through tax revenues for insurance compensation for periods away from work owing to unemployment, sickness, and disability, and family benefits in conjunction with childbirth. In this way, distributional policy is added into the Latvian NDC schemes.²

This paper presents an assessment and discussion of the development of Latvian NDC over its first 20 years. It also provides a picture of what projected demographic and economic developments say about its financial sustainability and affordability in the half decade beginning in 2020. The story begins with a country in steady demographic decline due to low fertility rates and a high emigration rate. Despite this, labor force growth was positive

¹ The model employed is presented in Palmer et al. (2006).

² See the overview of Latvia, Italy, Poland, and Sweden in Chłoń-Domińczak, Franco, and Palmer (2012) for a more detailed discussion of Latvia in this context and a comparison with other NDC countries.

due to the remarkable increase in the formal labor supply and the density of contributions in the NDC's first 20 years.

The 2008–2009 recession and its aftermath forced Latvia to revisit its 1995 decision to split the 20 percent contribution rate equally between the NDC and FDC schemes. This was an unaffordable decision from the very beginning given the commitments made to current pensioners and the financial reality. This unrealistically high division of the overall contribution rate was the result of a political decision that was never supported by calculations – a lesson learned the hard way.

The analysis begins with a presentation of the underlying demographics and the projected development of the labor force. It then turns from an analysis of the first 20 years with NDC to an analysis of the financial sustainability and affordability of the NDC scheme going forward to 2070. The backdrop is an assumed continued decline of about 1 percent per year in the working-age population, leading to a similar decline in the labor force. At the same time the large pre-independence birth cohorts of pensioners begin to retire in the 2030s, accompanied by the continued financing of the growth of the FDC scheme.

Despite these financial challenges, the analysis shows that the NDC scheme is moving forward on a long-term equilibrium path, through continuous adjustments through the automatic stabilizers built into the valorization of accounts and indexation benefits, and the life expectancy component of the life annuity. This said, the analysis also shows that extra revenues beyond those generated in accordance with the modelling assumptions of the *Ageing Report, 2018* of the European Commission (EC 2018) will be needed during an interim period of 20–30 years from 2030. The study identifies and assesses the possibilities of a more optimistic development of the labor market – bolstered with policy designed to support increased labor force participation and continued high growth – and closes with a discussion of the financial options available to Latvia going forward. The final section analyzes the adequacy of benefits based on both empirical and theoretical replacement rates.

2. Latvian demographics and labor force participation

2.1. The fertility rate rebounded in the 2000s from record lows in the 1990s

Fertility rates within the present European Union (EU) were relatively high in the 1960s given economic stability, growth, and post-war optimism. The average fertility rate was 2.67 children per woman in 1960, following the baby-boom of the 1950s, but by 1970 the rate had dropped to 2.31.³ This decline continued, reaching 1.97 in 1980 and 1.79 in 1990. By the turn of the century, the average for all present EU countries together was under 1.5 children per woman.

Latvia's total fertility rate hovered around 1.9–2.1 during the period 1950–1984, staying close to but below the rate of 2.1 needed to reproduce the population. With the disruption of the economy and ensuing economic uncertainty, Latvia's fertility rate fell to about 1.2 in 1999 from around 2.0 at the time of independence from the Soviet Union. From 2000 it increased gradually to about 1.7 in 2016 (1.74) and 2017 (1.70). According to the 2018 projections of the EC's Economic Policy Committee Working Group on Ageing Populations and Sustainability (EC-EPC (AWG)), Latvia will achieve a total fertility rate of close to 1.85 during the period 2020–2070,⁴ still below the 2.1 rate needed to maintain a steady population size – and labor force.

2.2. The working-age population shrank from 1996–2016 but the labor force grew due to increased participation

A second significant demographic event during the 20-year period from 1995 was the decline in Latvia's working-age population (i.e., those aged 20–64) by about 20 percent (Figure 2.1), the result of net emigration.⁵ The decline was largely within the age group 20–

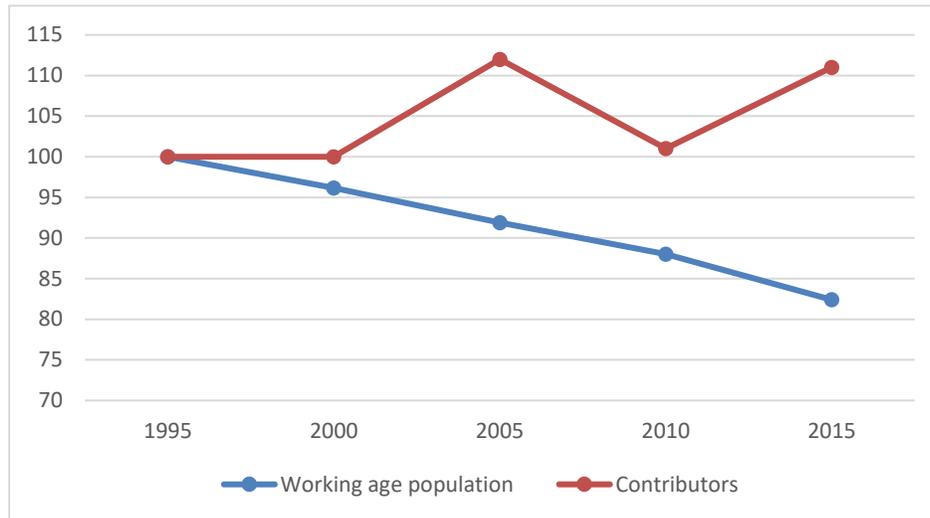
³ The country data referred to in this discussion are European Union (EU) data from the *Ageing Report, 2015* (EC 2015a, Table I.1.1, page 9).

⁴ According to the EC's projections performed in conjunction with the *Ageing Report, 2018* (EC 2018).

⁵ Ibid.

39. Despite this, the share of the working-age population participating in the labor force was about 11 percent higher in 2016 than in 1995 (Figure 2.1).

Figure 2.1: Development of Latvia’s working-age population (20–64) and contributors, 1995–2015



Source: Department of Social Insurance, Latvian Ministry of Welfare.
Note: Index = 100 in 1995.

Table 2.1 shows that the current projections for the growth of the Latvia working-age population embody a close to 45 percent decline from 2016 to 2070.

Table 2.1: Working-age population (age 20–64), 2016–2070 (000’s of persons)

2016	2020	2030	2040	2050	2060	2070
1,186	1,108	922	817	726	645	660

Source: EC-EPC (AWG) 2018 projections for the *Ageing Report, 2018* (EC 2018).

The extremely low fertility rate throughout the period 1995–2015 has a substantial negative impact on growth of the labor force through the 2030s, together with continued net emigration of younger workers. As a result of these two demographic forces, the working-age population is projected to fall from about 1.2 million persons in 2017 to 650,000

persons by 2060–2070, despite an assumption of fertility rates of around 1.85 from 2020 onward.⁶

The obvious challenge for Latvia is to counter the continued outflow of working-age persons, while at least maintaining and preferably increasing the present fertility rate. The latter could be promoted through family policies of better daycare and afterschool public care, and earnings replacement for time away from work after childbirth.

2.3. An increasing rate of participation in the formal labor force was accompanied by increasingly more contributors paying contributions on a regular monthly basis

For the purposes of this study, the Latvian State Social Insurance Agency (SSIA) performed a study of the monthly development of contributions from 1996–2016. The database was drawn from the entire working-age population – defined in this context as persons aged 15–63 from 1996 to 2016. Age 15 is the first possible age to become a contributor, and in 2016 age 62 and 9 months was the average age of exit.

All monthly contribution payments for all individuals born in the years 1953, 1961, 1971, and 1981 were examined to follow the dynamics of contribution payments of: the cohorts born in 1953 and 1961, who were already working-age cohorts in 1996; the cohorts born in 1971, who were 25 years old when the NDC was introduced in 1996; and the 1981 birth cohort, which turned 15 in 1996. The 1981 cohort was the first to be completely covered by the Latvian NDC. The cohort born in 1953 retired in 2016, with an average exit age of 62.7.

The results (see Appendix 1) show that contribution density increased dramatically in the period 1996–2016:⁷

⁶ According to the 2018 round of EC-EPC (AWG) projections.

⁷ Note that the working-age population is defined as persons aged 15–64. Persons aged 15–19 are to a considerable extent still in education, although they may work part-time. Also, the minimum pension age for men was 60 at the outset and 55 for women, and these increased successively during 1996–2016.

- Contributions were paid at age 43 for 12 months per year by 72 percent of those born in 1953, by 78 percent of those born in 1961, and by 83 percent of those born in 1971. A similar pattern can be observed for persons aged 35. About 69 percent of those born in 1961 paid a full 12 months of contributions at age 35, compared with 78 percent of those aged 35 born in 1971 and 82 percent of those aged 35 born in 1981.
- The assessment shows no strong gender differences, although about 2 to 4 percentage points more women than men pay all 12 months per year.
- By definition, these data say nothing about the level of contributions, and no systematic data exist to examine contribution amounts. However, for about 30 percent of all contributors, contributions are paid on an amount no greater than the minimum wage, according to information from the Ministry of Welfare, compiled by the SSIA.
- The overall conclusions regarding the development of the labor force in 1996–2016 are that: (i) both the number of contributors and the number of months they paid contributions increased during Latvia’s first 20 years with NDC; and (ii) the increase in contributors and contribution density – months with paid contributions per contributor – more than outweighed the negative effect in the decline in the working-age population during the same period.

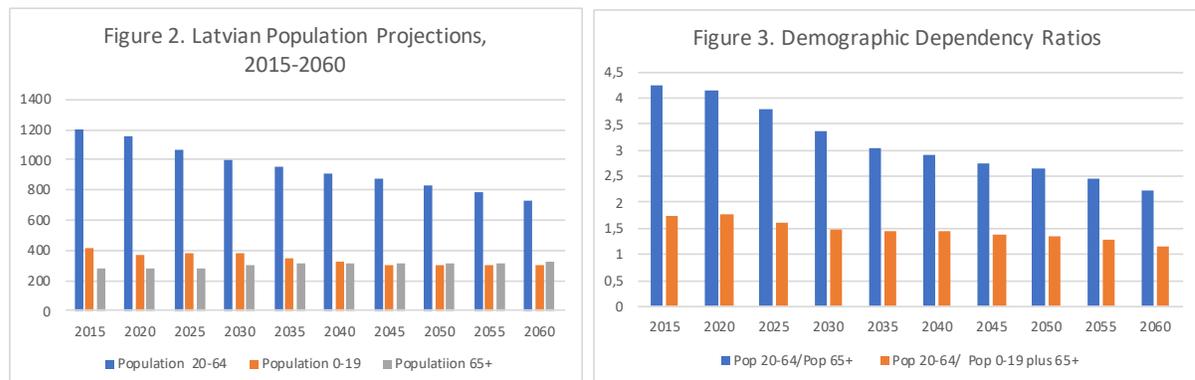
2.4. Demographic dependency ratios

A fertility rate of 1.85 and the continued net emigration of the younger population is reflected in the fall in the ratio of working-age persons to persons 65+ (i.e., the demographic support ratio) from 4.2 in 2015 to 3.1 in 2060. More importantly for the system’s finances, the population of Latvia (Figure 2.2) and the number of persons available for employment (age 20–64) relative to the number of persons 65+ (pensioners) (i.e., the

demographic dependency ratio) will decline from about 4.2 to about 2.2 in coming decades (Figure 2.3).

Figure 2.2: Latvian population projections, 2015–2060

Figure 2.3: Latvian demographic dependency ratios, 2015–2060



Source: United Nations 2017.

If child dependents are also included, the decline in the ratio of the working-age population to persons 65+ and children together is equally dramatic – from about 1.75 to about 1.2 (Figure 2.3). The projected decline in the labor force mirrors the demographic decline, as the next section shows. The economic dependency ratios are even higher.

3. Financial sustainability of Latvia’s NDC scheme⁸

By design an NDC scheme embodies dynamic adjustment of the pension system’s liabilities. This occurs through two mechanisms. One is the valorization of account values and indexation of pensions; the other is through application of the life expectancy factor in determining the amount of benefit to be paid out yearly over a retiree’s lifetime. Using the AWG 2018 assumptions for Latvia, this section examines the long-term financial prospects for the Latvian NDC pension scheme for 2020–2070.

⁸The calculations presented in this section are those used for the Latvian Ministry of Welfare’s calculations for the *Ageing Report, 2018* (EC 2018) based on the EC-EPC (AWG) assumptions.

3.1. Growth of the contribution wage base and indexation through 2016 in Latvia's NDC and projections for the future

The analysis begins with a dissection of the growth rate of the nominal-valued contribution wage base. This is described by three parameters, $g + \lambda + p$, where g is the rate of growth of the real per capita contribution wage, λ is the rate of growth of the number of contributors, and p is the rate of growth of prices, measured by the Consumer Price Index (CPI). These three factors are also the components of the valorization of Latvian NDC participants' accounts.⁹

According to new legislation, beginning in 2017 NDC benefits were to be indexed by $p + 0.50 \times (g + \lambda)$, which only partially covers the entire theoretically correct index $p + g + \lambda$, i.e., the growth of the nominal wage-sum. This is still the case for persons with contribution years up to 30 years. But from 2018 the value of indexation for 30+ years is 0.60 for contribution years in the interval 30–39, and 0.70 for 40+ contribution years. In the initial years, benefits were indexed solely with the change in CPI, but this was slowly changed to include a fraction of $g + \lambda$. However, from the outset the original goal was to increase the indexation of benefits to the full potential level, $p + g + \lambda$.

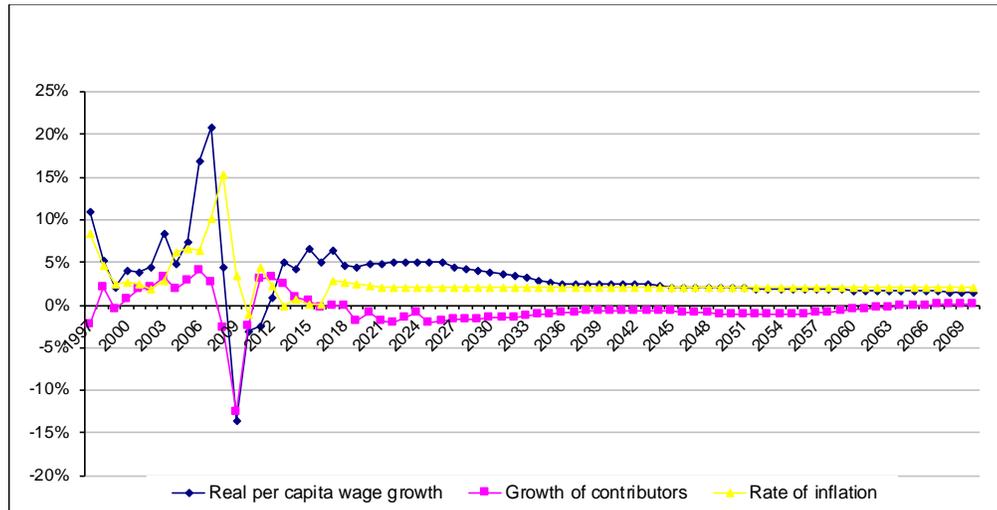
λ and g are the two dynamic adjustment factors that work together to keep the NDC pension scheme on a long-term equilibrium gyrating around the fixed NDC contribution rate. The inflation rate has the well-known effect of maintaining the real purchasing value of accounts and pensions. Figure 3.1 plots the actual values of p , g , and λ through 2016 and projected values from 2017 through 2070. The projections shown in Figure 3.1 are derived from the Latvian model, based on demographic and labor force participation assumptions provided by the EC AWG. Several observations of importance emerge in connection with the dynamics shown in Figure 3.1.

⁹ See Palmer (2013) for a presentation of the underlying model.

First, the growth in employment (contributors) in the first 20 years of NDC is clear. Figure 3.1 illustrates the dynamics of the NDC story; the results for the stability of the contribution rate are discussed below. Emphasized here is that the dynamics of the development of contributors are in line with economic efficiency: the combination of individual accounts and the 1:1 link between contributions provides a positive incentive for formal labor force participation. It is unknown to what degree the NDC design was responsible for the strong increase in the number of contributors and to what extent this was just a natural result of the development of a formal market economy in the years following independence. Nevertheless, the role of the NDC account is assumed to have been a part of the NDC's success. That is, it must have tipped the scales in favor of supplying formal rather than informal labor in situations where the option presented itself as an alternative.

Looking forward, as the small birth cohorts from 1995–2015 reach working age, they constitute a smaller group of potential workers in the decades from 2020. As already discussed, going forward in time, the younger cohorts are assumed to continue to opt for emigration from Latvia.

Figure 3.1: Rate of growth of real wage rate per capita and of contributors, and the rate of inflation (annual percentage change), 1997–2070



Source: Department of Social Insurance, Latvian Ministry of Welfare.

Note: Based on actual values for 1997–2016 and projected values for 2017–2070, using assumptions underlying the calculations performed for the *Ageing Report, 2018* (EC 2018). The rate of inflation is the deflator for wage growth.

Second, the average rate of growth of real per capita wages was 4.9 percent over 1997–2016. Of course, the continued strong real wage growth seen in Figure 3.1 is the result of steadily increasing productivity growth in Latvia and – with this – the development of a labor market with increasing long-term opportunities for new entrants – which means that the current projections for high emigration might be overly pessimistic.

Third, real wage rate growth of well over 2 percent is projected into the mid-2040s, and remains at about 2 percent thereafter. This gives a positive real wage-sum valorization of individual accounts and indexation of pensions around an average of 1.5 percent through the half century 2020–2070. Underlying this is the negative influence of the declining labor force – occurring because when fertility rates are not sufficient (greater than 2.1) for population replacement and because of the added effect of the migration of younger workers from the country. The net result is lower increases in the valorization of worker accounts and indexation of pension benefits, compared with what “pure” wage indexation would yield without this adjustment.

Finally, two forces are at work in determining future prospects – a demographic effect and a labor supply effect. First consider the demographic effect – the scale of the fertility rate, which determines the cohort size entering the workforce 15–25 years after birth. An increase in the fertility rate from the last observed value (2017) of 1.85 would improve prospects from 2050 onward but would not affect the size of the labor force until then. Of course, participation may continue to increase even more than projected. The policy parameter that remains is increasing the age of labor force exit by increasing the minimum pension age beyond that prescribed by current legislation.

In summary, even with a large deduction for the negative labor force growth expected for 2020–2070, full wage-sum indexation will give positive real indexation to both NDC account holders and pensioners during the entire period.

3.2. The minimum retirement age is scheduled to increase in the future

The minimum age at which a pension can be claimed has been increasing since 2014 at the rate of 3 months per year and will reach 65 in January 2025. A pension age for both genders of 65 is in line with what is now the normal pension age in the EU. In fact, some countries have already legislated increases to age 67 and many are considering or have legislated indexation of their minimum pension age to life expectancy.

Unisex life expectancy at age 60 in Latvia increased by 2.3 years from 1997 to 2017. This relatively rapid rate increase should be viewed in the overall context of accelerating increases in survival rates among 65- to 85-year-olds (Alho, Bravo, and Palmer 2013; Palmer, Alho, and Zhao de Gosson de Varennes 2018),¹⁰ which is a strong indicator that this process is probably at work in Latvia.

¹⁰ The countries researched in these studies are Denmark, Finland, France, Italy, Japan, the Netherlands, Portugal, Norway, Sweden, the United Kingdom, and the United States.

3.3. How the financial development of the NDC scheme was affected by introduction of the mandatory FDC scheme within a fixed contribution rate for both of 20 percent

Moving from a pay-as-you-go to a prefunded pension system involves a transition period during which previous rights in the old pay-as-you-go pension scheme must be honored, while at the same time savings in the form of FDC contributions are channeled into FDC financial portfolios. The mechanism that originally made this transformation financially conceivable within the framework of a 20 percent contribution rate was the knowledge that the “baby-boomers” of 1970–1975 and 1980–1985 would create a surplus in the NDC scheme for four decades after the turn of the century.

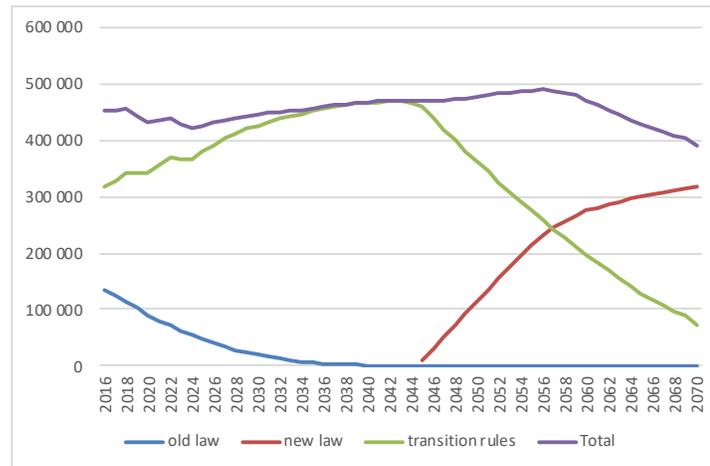
The government’s reform proposal in 1995 had three goals. The first was to share equally the 20 percent contribution rate between the NDC scheme to be introduced in 1996 and the FDC scheme to be introduced at a later date. The second was the ambition to reduce the overall contribution rate for social insurance expenditures from 38 percent in 1995 to 33 percent by 2003. The third was to begin wage indexation of pension benefits, also after 2002 (Fox and Palmer 1999). This was too ambitious, however, as shown in a paper presented at the joint Swedish-World Bank NDC conference in 2003 and published in Palmer et al. (2006) – a total contribution rate of at least 24 percent would be required to cover total costs for both. The calculations performed in that study also indicated that NDC long-term sustainability could be maintained with a carve-out of a contribution rate of 6 percent for the new second pillar, retaining the overall contribution rate of 20 percent for the NDC and FDC schemes together. This effectively reduced the NDC contribution rate to 14 percent, while the pensions granted preceding the introduction of the FDC scheme were all based on an NDC rate of 20 percent. Furthermore, at the time these calculations were performed the strong flow of working-age emigrants from the late 1990s and forward had not really begun. Although emigration could be anticipated, the strength of the outflow and its duration were not anticipated.

Latvia introduced the FDC scheme in 2001 with a schedule aspiring to carve out one-half (i.e., 10 percent) of the 20 percent NDC contribution rate for the FDC scheme. The initial contribution rate to the FDC scheme was 2 percent from 2001–2006, 4 percent in 2007, and 8 percent in 2008. The recession of 2009–2011 hit Latvia particularly hard, however, with strong repercussions in the job market (see the relevant years in Figure 3.1). The contribution base fell dramatically, with an accompanying fall of 33 percent in the wage-sum and thus contributions. To cover NDC expenditure commitments, the contribution rate to the FDC scheme was reduced to 2 percent in 2009–2012. As the economy turned up, the FDC contribution rate was increased again to 4 percent in 2013 and 2014, to 5 percent in 2015, and to 6 percent in 2016 – where it is scheduled to remain. This is thus the working premise for the financial sustainability analysis that follows.

3.4. How did Latvia financially manage the transition from pre-reform to new law pensions and what are the prospects for the coming half century?

The total number of pensioners can be divided into three categories: persons who were already (Soviet) “old-law” pensioners when the reform was introduced in 1996; pensioners whose work records in the Soviet system through 1995 were converted into initial capital in individual accounts in the NDC scheme beginning in January 1996 – i.e., “transition rule” pensioners; and persons with their benefits computed solely from the new rules, in accordance with their account values in the NDC and FDC schemes (Figure 3.2).

Figure 3.2: Distribution of pensions by pensioner type, 2016–2070



Source: Department of Social Insurance, Latvian Ministry of Welfare. Projections are based on the assumptions underlying the calculations performed for the *Ageing Report, 2018* (EC 2018).

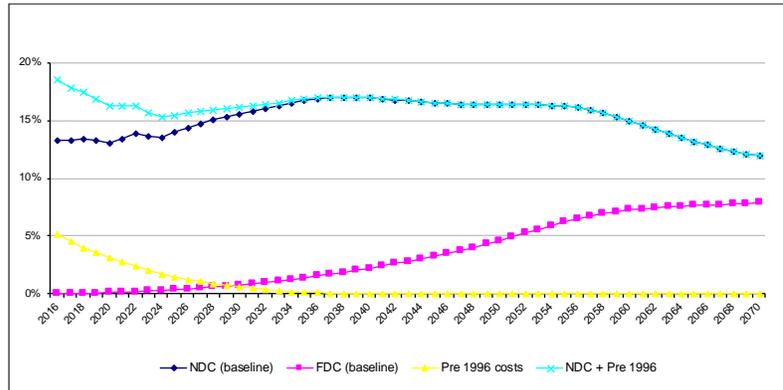
Note: Old-law pensioners, “transition-rule” pensioners, and pensioners with all rights earned in accordance with the 1996-reform (new law).

First note that old-law pensioners – persons granted benefits up through December 1995, some based on special conditions at ages as low as 40 and all women aged 55 – are mostly phased out by 2035. A second observation is that from 2045 on, pensioners with part of their total capital based on the transition rules begin to decline in number, and those whose pensions are based completely on the new law (i.e., NDC and FDC) see their benefits begin to increase at a fast rate.

3.5. What is the development of NDC pension expenditures and revenues moving toward 2070?

In 2016, the ratio of NDC expenditures to the contribution wage base was 13.3 percent, still under the 14 percent contribution rate on individual income that gives rise to individual accounts. Figure 3.3 shows the projected development of pension expenditures expressed as a percentage of the contribution wage base. Note that FDC pension payments increase in strength from around 2030 at about the same time as the expenditures on pre-1996 benefits rapidly approach null. Also noteworthy is the effect on expenditures of the large birth cohorts born prior to 1990 becoming pensioners from around 2035.

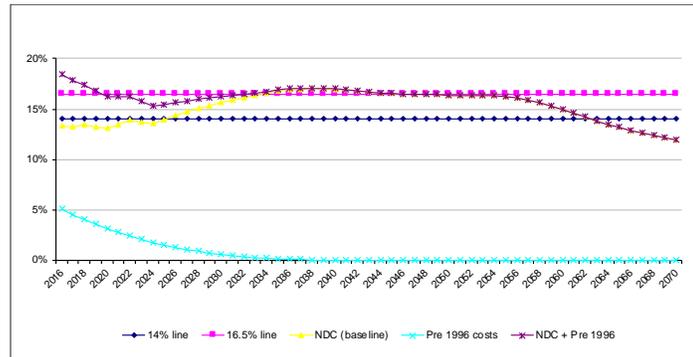
Figure 3.3: Expenditures on pensions (% of the contribution wage base), 2016–2070



Source: Department of Social Insurance, Latvian Ministry of Welfare. Projections are based on the assumptions underlying the calculations performed for the *Ageing Report, 2018* (EC 2018).

The NDC scheme pension expenditures expressed as a percentage of the contribution wage base remain largely within a corridor corresponding to a contribution rate of 14–16 percent, moving into equilibrium at 14 percent in the 2050s (Figure 3.4). The predominant drivers are (i) the large pre-reform birth cohorts who become pensioners, (ii) the period thereafter with continued very low fertility rates, accompanied throughout 1995–2070 first by (iii) large-scale actual emigration of the younger working-age population, and then (iv) their assumed continued large-scale emigration.

Figure 3.4: Expenditures on pensions – NDC and pre-1996 (% of the contribution wage base), 2016–2070



Source: Department of Social Insurance, Latvian Ministry of Welfare. Projections are based on the assumptions underlying the calculations performed for the *Ageing Report, 2018* (EC 2018).

The numbers behind the curves tell a clear story. In 2016, the ratio of NDC expenditures to the contribution base is 13.3 percent, i.e., still well below the contribution rate of 14.0 percent. Finances still require a contribution rate of only 14.0 percent in 2025, but from here the ratio of expenditures to the contribution base climbs steadily to 16.7 percent in 2035. It begins to fall gradually from around 2040, reaching 15.0 percent in the early 2050s. The ratio gradually declines again to 14.0 percent in the late 2050s. In the end, and despite the (assumed) continuous fall in the working-age population costs from 2015 through 2070, the NDC pension scheme returns fully to equilibrium around 2060, with a ratio of NDC expenditures to the contribution base of only 12.0 percent as the last of the large pre-reform birth cohorts die out.

In summary, by the mid-2030s a contribution rate of around 16–17 percent will be required to finance NDC commitments if the “main” EC AWG 2018 assumption of an average 1 percent per year decline in the labor force beginning slightly before 2020 becomes reality. Needless to say, the occurrence of a more immediate and less acute decline in the working-age population – especially during the period 2020–2040 – would keep the NDC scheme much closer to a 14 percent contribution through 2070. Generally speaking, the key issue for Latvia’s pension policy going forward is to create a labor market that supports such a development. This is the topic of the next section.

3.6. How does Latvia plan to deal with the projected deficit in revenues 2030–2050?

Although Latvia has no explicit fund, the government – in this case the Ministry of Welfare – has an explicit framework of budgets for the various expenditures within the overall pension system and other areas of social insurance. At the time of this writing, in 2017, an overall amount of money equal to a contribution rate of 24.5 percent is budgeted for overall expenditures on pensions, including minimum pensions.

It is possible that the funds already available and those that will become available given present contribution rates will be sufficient to cover the 20-year deficit in revenues in 2030–2050, which gradually declines with the present assumptions in the 2050s. The reason for optimism is that the assumptions underlying the projections for the emigration of the working-age population may be much too pessimistic. Why is this?

A significant percent of the projected deficit may be financed by an increase in the rate of participation – through a normal progressive increase in the average number of lifetime contribution years per person, *ceteris paribus*, from the present assumption of 35 to 40–42 years by the beginning of the 2030s. Specifically, an increase to 42 years of work and contributions by around 2030 would increase the contribution base by 20 percent, thereby equalizing expenditures and revenues. Notably, the best performer in the EU (Sweden) was already at about 42 years for both men and women in 2016, with an average exit age of just under 65. In addition, increases in the normal pension age beyond the presently legislated minimum pension age of 65 – progressively to 68 by 2060 – are in line with the projected increase in life expectancy at age 65. This creates more revenues from the contributions of those who continue to work and increases the liquidity of the NDC pension scheme. A third development that would generate more revenues is a more positive scenario for emigration over the coming half century –starting in the 2020s. This could be supported by a conscious policy to channel increasingly more resources from the second-pillar funds into both market-motivated and infrastructural investments, creating job opportunities and growth.

4. Adequacy of benefits

The overall goal of the public pension system is to generate what is regarded to be a sufficient replacement rate deriving from the mandatory universal public pension commitment. Here adequacy is defined in terms of the average (actual) replacement rate (ARR) and the theoretical replacement rate (TRR) under various assumptions, including pre- and after-tax. In the Latvian NDC framework, participants have to fulfill a qualifying condition of 15 years (to be increased to 20 in 2025) of contributions to qualify for an NDC benefit. Those who do not fulfill this criterion receive a minimum pension.

Several ways exist to define the replacement rate. Two definitions published in the EC's *Pension Adequacy Report* (EC 2015b) are the basis of Table 4.1 and Table 4.2, and are as follows:

Definition 1. The average replacement rate (ARR)

The ARR is calculated from all pensions (including survivors' pensions, and occupational and individual private plans). It is calculated as the median (pre-tax) sum of individuals' benefits for persons aged 65–74 in relation to the median (pre-tax) gross earnings per wage earner aged 50–59.¹¹ The ARR is shown in Table 4.1. All other replacement rates in Table 4.1 and Table 4.2 are TRRs.

Definition 2. The theoretical replacement rate (TRR)

The TRR is based on assumptions about the full-career worker and is calculated pre- (gross) and after-tax (net). The hypothetical worker earns the average wage for 40 consecutive years from age 25 and retires at age 65 or at the country's standard pension age (denoted SPA in the tables). The assumed SPA for Latvia is age 62.

¹¹The underlying data are from the European Union's SILC database.

The hypothetical person is born in 1948 (a man) or 1951 (a woman) and retires in 2013 or 2021, alternatively. For the TRR calculations for retirement in 2013, historical data are used. For calculations beyond 2013, the TRR calculations are based on the historical data through 2013. For going forward from 2013, the EC AWG assumptions for real per capita wage, labor force growth, and inflation (2 percent) are used. The contribution rates employed in the calculations are 14 percent (NDC) and 6 percent (FDC) from 2016, together with the legislated rates going back in time. TRR calculations are performed separately for men and women due to their separate pension ages to 2025.

4.1. How Latvia's replacement rates compare with those of other EU countries

The ARR, which are based on actual empirical outcomes, are shown for Latvia and seven other EU countries in column 1 of Table 4.1. Latvia's ARR is 48 percent, closely in line with that of all countries in the table except Sweden (60 percent) and France (63 percent).

Table 4.1: ARRs and TRRs for Latvia and selected EU countries

	(1) ARR 2013: Retirement country's SPA*	(2) Pre-tax TRR 2013: Pre-tax LF=40 years to SPA**	(3) TRR 2013: LF=40 uninterrupted years to SPA***	(4) After-tax TRR 2013: LF=40 uninterrupted years from age 25 up to age 65***	(5) SPA in 2013***
Latvia	48	47	65	72	62
Lithuania	49	41	53	66	M=62.7 W=60.6
Estonia	50	43	57	69	63
Sweden	60	69	69	69	65
Finland	50	62	70	70	65
Denmark	48	48	68	68	65
Germany	48	40	57	57	65.2
France	63	68	80	80	65

Source: The 2015 Pension Adequacy Report (EC 2015b, Section 3.1.2. * Figure 3.1, page 125. ** Table 3.4, page 135.***Table 3.2, page 118.)

Note: *Average of men and women. SPA = standard pension age; LF = labor force; M = men; W = women.

Columns 2–4 of Table 4.1 show the TRRs. Comparison of columns 2 and 3 shows that after-tax replacement rates are higher in Latvia than pre-tax replacement rates in all other countries except Sweden. The difference is 8 to 20 percentage points, with an 18 percentage point higher after-tax rate for Latvia.

A separate tax regime for pensioners proves to be important for Latvian pensioners: the after-tax effect on replacement rates in Latvia is second only to that in Denmark. Sweden is the only country in the table where the pre- and after-tax replacement rates are the same, reflecting the fact that earnings and pension income had largely the same tax rates in 2013. (Taxes on both wages and pensions have decreased since then.)

Together columns 3 and 4 in Table 4.1 show that room remains to increase replacement rates by increasing the SPA from the present age to 65. The higher pension age boosts

replacement rates in all three Baltic countries. The effect is due to two factors –higher contributions and actuarial adjustments in benefits deriving from the shorter length of longevity from an older age of retirement.

4.2. Assumptions underlying the calculation of the AWG TRRS calculations

Table 4.2 presents additional estimates based on historical data prior to 2013, with more precise assumptions constructed on a country basis for the ages of entrance and exit and thus the length of average working careers. This is the group of assumptions also used for the macroeconomic calculations to 2060 in the *Ageing Report, 2018* (EC 2018). The assumptions regarding the ages of labor force entry and exit are from the cohort simulation model (CSM) developed by DG ECFIN.¹² These estimates are used to calculate the after-tax TRRs shown in Table 4.2. Table 4.2 also provides information about the assumed career length, age of exit, and working life in years used in the calculations.

¹² Box 3.3, page 20 of the *2015 Pension Adequacy Report* (EC 2015b) presents assumptions in greater detail.

Table 4.2: TRRs based on the AWG model of age of entry and exit into the labor force

EU member state	(1) AWG TRRS based on career lengths and the exit age in col. (2)		(2) AWG assumptions, years Exit age Career length				(3) Actual working life in years (2013)	
	M	W	M	W	M	W	M	W
	Latvia	73.8	70.9	64.6	64.0	43.0	40.8	35.0
Lithuania	53.3	54.7	62.8	61.9	40.6	38.1	34.1	34.2
Estonia	50.9	64.8	64.4	64.2	43.0	41.4	36.6	35.7
Sweden	75.1	70.5	65.8	64.5	44.8	42.7	42.1	39.6
Finland	65.5	63.8	63.6	63.1	41.6	40.3	37.7	36.6
Denmark	68.4	75.7	65.6	63.4	43.0	40.3	40.2	37.6
Germany	62.8	55.4	65.1	64.2	44.1	42.0	40.1	35.1
France	74.1	63.6	60.8	60.9	39.3	37.5	36.5	32.8

Source: *The 2015 Pension Adequacy Report* (EC 2015b, Section 3.1.2. Table 3.3, page 121).

Note: TRRs are based on after-tax pension income and earnings. M = men; W = women.

The last two columns in Table 4.2 show that recently retired men and women in the Baltic states work and contribute considerably fewer years “today” compared with the 40 years assumed in the theoretical calculations in Table 4.1. This said, career lengths with exit at age 65 are expected to become considerably longer compared with career lengths for persons turning 65 in 2013, reflecting an increase in the minimum pension age and associated

postponement in labor force exit with retirement for both genders to about 65 for both, combined with earlier entrance into the labor force. Given this increase in career length, compared with the actual career length in 2013 (column 3 in Table 4.2), the TRRs for Latvian men and women are essentially the same as the results in column 4 in Table 4.1. In other words, the AWG modelling motivates these outcomes based on increased working-career “profiles.”

What can be concluded about adequacy from Table 4.1 and Table 4.2? First, the pre-tax ARR based on empirical data is 48 percent –on par with the other two Baltic states, Finland, Denmark, and Germany, but lower than that of Sweden and France. An explanation is that the replacement rates for the latter two countries are based on a higher overall contribution rate, which in the case of Sweden also consists of a larger component of mandatory and occupational FDC pensions. Second, for Latvia, the pre-tax TRR is about the same as the ARR. However, the tax rate is important for the end result in Latvia. The after-tax TRR is 65 percent, with a pension age of 62, and 72 percent if the pension age is set at 65, everything else equal.

Finally, note that the exit-age assumption used for the AWG’s simulated ages of entrance and exit (close to age 65) also gives an after-tax replacement rate of 72 percent. The bottom line is, however, that to achieve these replacement rates requires a working-career length of about 42 years (43 for men and 41 for women) – instead of the approximately 35 career years of new pensioners in 2013 for retirement at age 65. This will require both an early entrance into the labor force and working longer.

5. Conclusions, discussion, and open issues

Three important conclusions emerge in summing up the first 20 years of Latvia’s NDC scheme, and two important outstanding issues need to be addressed.

The first conclusion is that the NDC scheme was successfully implemented and is both financially stable and sustainable. The transition to the NDC structure itself provided the

framework for a paradigm shift in thinking. Pensions became a transfer of one's own resources from working years to financing consumption in retirement. The implementation process required managing the difficult transitional issues associated with rights acquired from the Soviet system, including phasing out a plethora of separate rights for "special" groups.

A second accomplishment was raising the pension age – officially from 55 for women and 60 for men, but in reality much lower given the extensive scheme of special privileges in place in 1996. The NDC narrative contributed gradually to adjusting people's expectations about their working lives upward with increasing life expectancy. In 2017, the minimum pension age was 63 for both genders, with a scheduled increase to age 65 in 2025. This has two important effects. First, it provides an increase in the labor supply. Second, in comparison with a lower pension age, the process serves to increase the yearly amount of benefits as life expectancy increases, compared with what they would have been otherwise. Both of these result from the basic properties of NDC schemes, although indexation and the use of life expectancy in creating life annuities also interact to keep the system financially stable and affordable.

Third, the increase in participation in the formal economy and the strong increase in coverage from 1995–2017 was remarkable. The increase in coverage was instrumental in offsetting the strong decline in the working-age population during this period. Latvian pension reform has come a long way in fulfilling its potential, but importantly, more remains to be accomplished. The next challenge is to increase the number of years worked of persons claiming a pension – from 35 in 2017 to over 40 in the coming four decades.

The present assumptions underlying projections for the future embody an extremely pessimistic picture of the Latvian working-age population, despite a relatively high fertility rate of around 1.85 children per woman. This is due to strong net emigration of the working-age population at a rate of about 1 percent per year during 2020–2070. A partial

solution is for Latvia to use its financial pension funds to develop its infrastructure and support market investments.

A final note is that if Latvia achieves and maintains balance in its demography and if this balance is also reflected in the demand for labor and accompanying labor force participation, then this goal will be achieved. Under the current circumstances, however, the continuous downward pull of demography requires a continuous negative adjustment in the otherwise positive overall rate of return, and with present projections the process will continue through the period 2030–2060. Nevertheless, despite the demographic projections, the NDC pension scheme's built-in dynamic adjustment process is leading to stable growth of pensions and can be considered a success.

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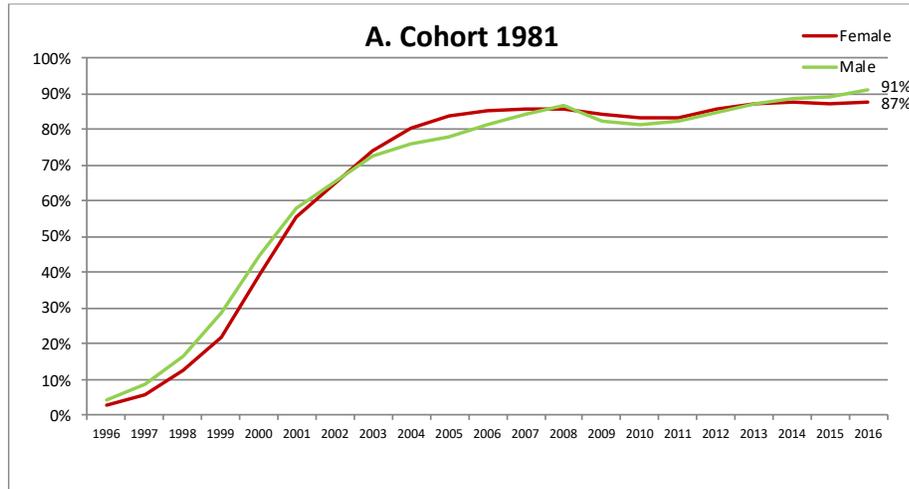
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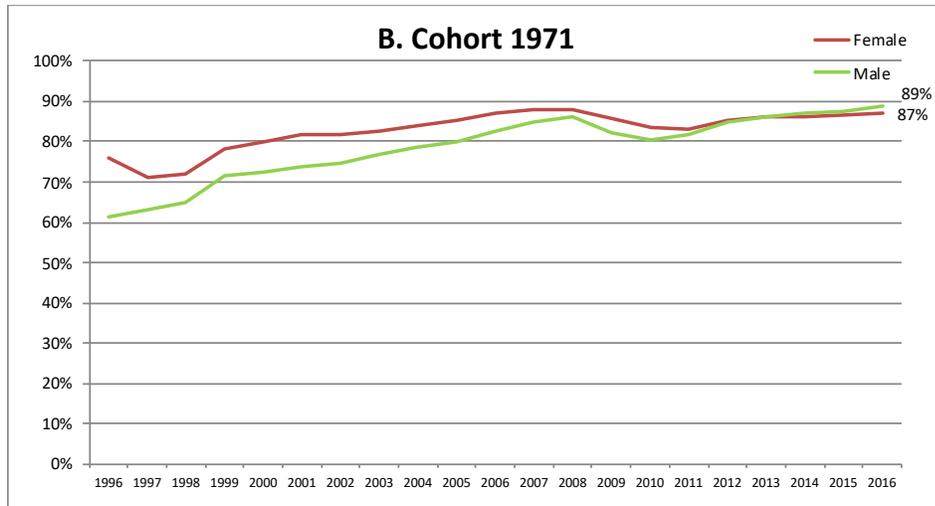
Appendix 1. Increasing coverage of the Latvian working-age population developed hand-in-hand with an increase in the density of contribution payments, 1996–2016

**Figure A1. Persons paying contributions 1 or more months per year
(% of the total population of the cohort on a yearly basis)**



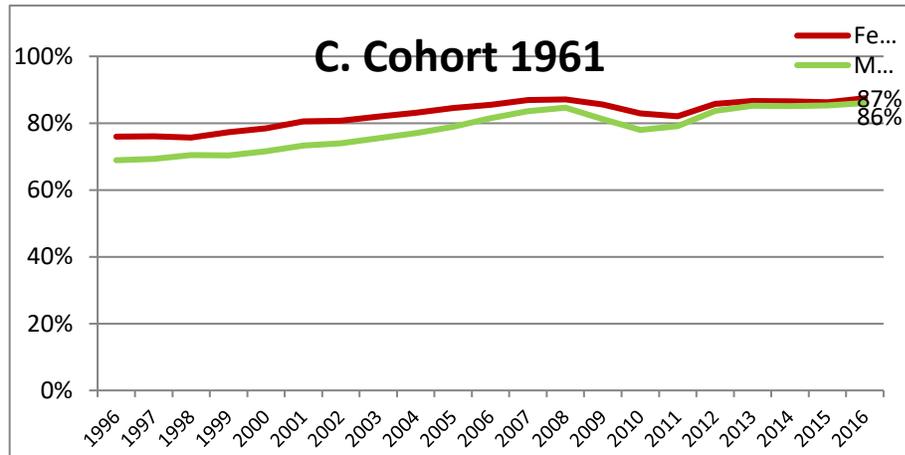
Source: Latvian State Social Insurance Agency and Ministry of Welfare.

Figure A2. Persons paying contributions 1 or more months per year



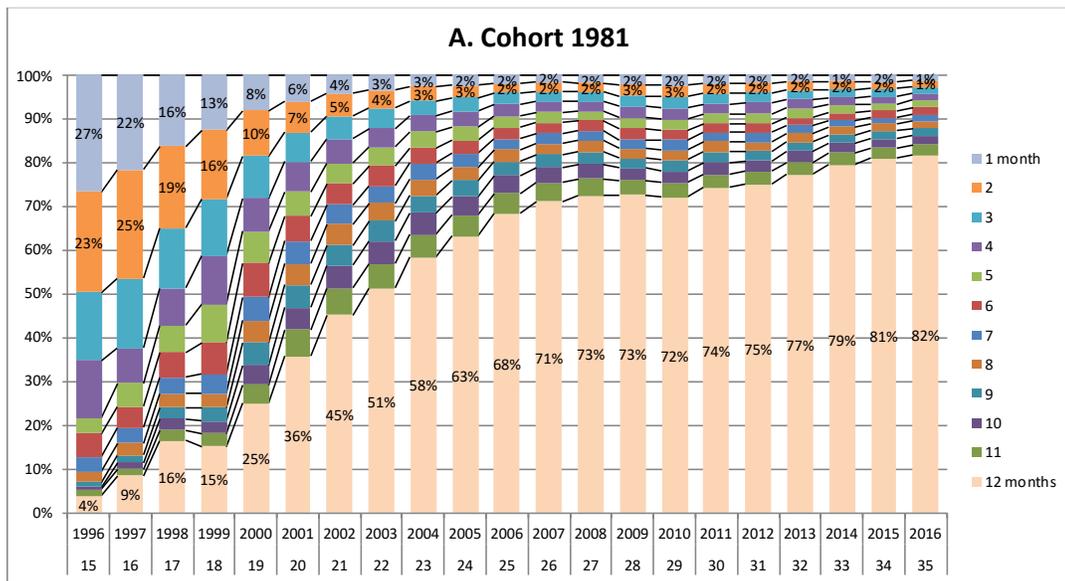
Source: Latvian State Social Insurance Agency and Ministry of Welfare.

Figure A3. Persons paying contributions 1 or more months per year



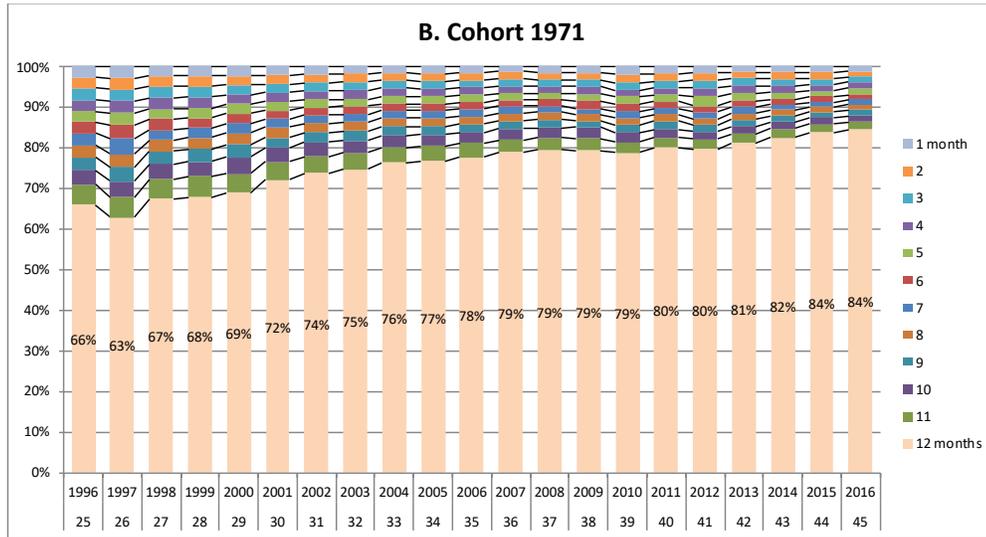
Source: Latvian State Social Insurance Agency and Ministry of Welfare.

Figure A4. Density of contributions paid 1 to 12 months in the years 1996–2016



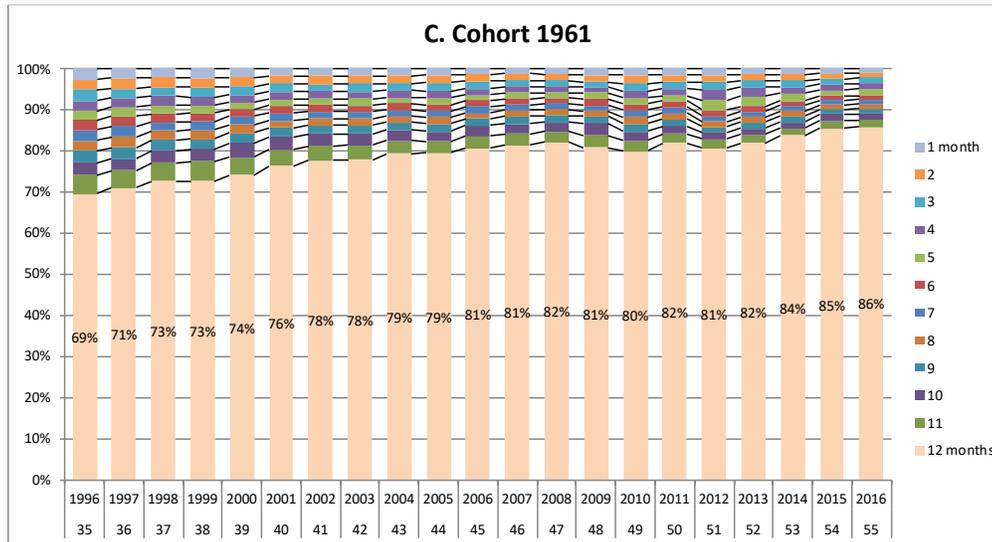
Source: Latvian State Social Insurance Agency and Ministry of Welfare.

Figure A5. Density of contributions paid 1 to 12 months in the years 1996–2016



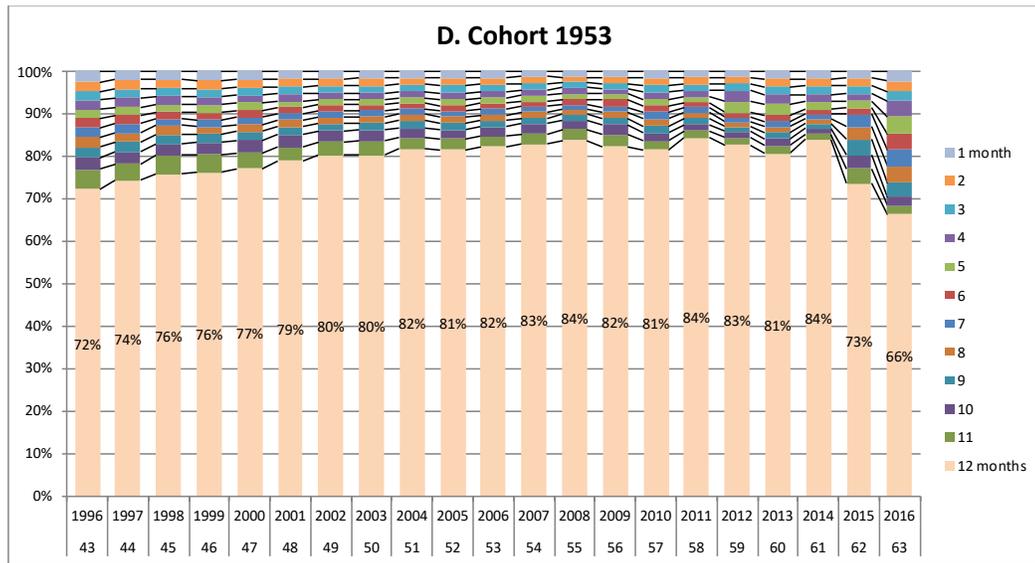
Source: Latvian State Social Insurance Agency and Ministry of Welfare.

Figure A6. Density of contributions paid 1 to 12 months in the years 1996–2016



Source: Latvian State Social Insurance Agency and Ministry of Welfare.

Figure A7. Density of contributions paid 1 to 12 months in the years 1996–2016



Source: Latvian State Social Insurance Agency and Ministry of Welfare.

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ABSTRACT

Latvia introduced a nonfinancial defined contribution (NDC) scheme in 1996 as it transitioned to a market economy. Despite a 20 percent decline in the working-age population from 1994–2016, the ratio of contributors to old-age pensioners rose from 1.6 to 2.1 given a steady increase in formal labor force participation and 5–6 percent real per capita wage growth. Projections show that long-term financial balance will be maintained through 2070, despite the threat of a projected 50 percent decline in the working-age population. Budgeted reserves will cushion the continued transition into a two-pillar public pension scheme. Latvia's most important long-term policy challenge is to create the domestic investments and economic growth to reward younger workers for remaining in the country.

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