
Chapter 1

The Status of the NDC Discussion: Introduction and Overview

*Robert Holzmann and Edward Palmer**

PENSION REFORM IS A WORLDWIDE ISSUE. There is hardly any country in the world where the reform of the existing pension system is not on the reform agenda. The drivers behind the need to reform differ somewhat between countries and across regions, but they share three communalities: first, short-term fiscal pressures typically dictate immediate action, while the looming, much larger problems resulting from an aging population and insufficient long-term resilience of systems remain inadequately addressed. Second, socioeconomic changes demand a rethinking of the basic ideas behind pension system design, some dating back more than 100 years. Third, the challenges and opportunities of globalization require countries to pay more attention to the economic effects of pension schemes, including creating a larger risk pool that extends over occupation, branch, and sector, and enables easy portability of rights both within and across country borders.¹

Against this background, in the 1990s a number of countries started comprehensive reforms of their pension systems, notably countries in Latin America and the transition economies of Central and Eastern Europe. These fundamental reforms were undertaken in an environment of difficulties in making parametric reform work, and they have aimed to at least put schemes on a financially sustainable basis. These systemic reforms have exhibited the potential as well as the limitations of moving toward comprehensive funded systems. Although the potential benefits of funding are high, so are the transition costs and the requirements for setting up these financial schemes. The need to address the demographic and economic reform pressures while avoiding creating additional burdens for future workers has generated international interest in a new genre of pension systems, non-financial or notional defined contribution schemes (NDCs).² NDCs address the fiscal, political, social, and economic needs of reform while keeping the fiscal burden of reform low. Yet, do NDCs offer a panacea for pension reform or are they merely the latest fad?

To address more systematically the question of what the NDCs bring to the pension reform table—their strengths and weaknesses—the World Bank and the Swedish National Social Insurance Board joined forces to organize an international conference, which was held October 2003 in Sandhamn, Sweden. The motivation for this conference was quite straightforward: The World Bank wants to know under what conditions and with what

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limitations this approach can be proposed to its international cliental. Although the experience in Latvia and Poland is encouraging, the sample is still too small to draw general conclusions about implementing NDCs in transition countries. The Swedish reformers, who spearheaded this new reform approach, wanted to share their experience; but they wanted also to bring a group of experts together to discuss possible improvements in the design and implementation of this innovation.

This conference volume presents the result of the deliberations of a number of leading economists, pension specialists, and policy makers from around the world. It contains 24 chapters plus a number of prepared comments. The chapters cover conceptual issues as well as the specific reform experiences of “pilot” countries. Most of the chapters were papers presented at the conference, but they have undergone major revisions since then. Some new chapters have been added to the proceedings after the conference to broaden further the contents of the book, making it a primer on the theoretical underpinnings of NDC and practical issues involved in its implementation.

The structure of the remainder of the introduction is as follows: the first section outlines in somewhat more detail the background of the reform pressure and the promised advantages as well as drawbacks of NDC systems. The second section provides a short review of the individual chapters and their main findings. The final section sketches the outlook: the lessons so far, the potential of the NDC approach, and the main research gaps to be filled.

Reform Pressures and the Promises of NDCs

What are the main reform pressures on pension systems? What do NDCs offer to the toolkit of pension reform when viewed within a broader economic and political perspective? What do the chapters contained in this volume say about what the NDC framework has to offer in addressing these questions? Our point of departure in answering these questions is to elaborate briefly on the pressures confronting pension reform as we enter into the twenty-first century.

Fiscal pressures continue to be the trigger for the initiation of a pension reform. Reforms are inevitably driven by short-term budgetary pressure resulting from the increasing costs of what in the long-term are fiscally unsustainable public systems. The more important longer-term problems of sustainability due to population aging typically figure less prominently in the political debate and associated reform process.

The *short-term fiscal pressure* for pension reform is always budgetary. The diagnosis is almost invariably that there are too many recipients and too few contributors. The underlying problem in developed economies is system maturation resulting in increasing benefit levels mixed with decreasing *de facto* retirement ages, accentuated by population aging and the deterioration in demographic dependency ratios (the ratio of elderly to the working-age population). Countries are frequently strapped down with high levels of expenditures on benefits, reflecting low and inflexible retirement ages set in times when life expectancy was considerably lower and in an economic environment that was characterized by high economic growth and employment. Developing countries usually have the additional problem of a highly informal labor force, which prevents the translation of a rising labor force into a low system dependency ratio (the ratio of beneficiaries to contributors). On the contrary, the system dependency ratio is high as a result of closed systems (civil service) or strong incentives to stay in the informal economy, including design and implementation features of the pension scheme, or other obstacles to join the formal economy. Stop-gap emergency action may move the system closer to short-term financial balance, but this can be counterproductive by removing focus from design issues that need to

be addressed to deal with the underlying long-term imbalances and the need to provide a country with a lasting and transparent set of rules for the public system.

The *longer-term fiscal pressure* is clearly linked to the aging of the population. All countries are more or less affected by this pressure as birth rates fall toward or below the level needed to reproduce the population and as falling mortality rates generate substantial increases in the longevity of the older population. It is not a question of whether this problem will become acute in a country, but when.

The need to act and the broader political and economic implications of different courses of action have come into sharper focus during the last decade. Three issues are of particular relevance for the design of pension systems: (1) Most of the future aging will take place in the developing countries where resources are scarcer. Careful design and cost-effective implementation are important for all countries, but the poorer countries are also less able to bear the fiscal burden of poor design. (2) Aging and population stagnation—and even decline—in the wealthier nations of the northern hemisphere will create arbitrage opportunities with the much younger and growing population in the developing nations of the southern hemisphere. This calls for a pension system that allows easy cross-border portability of acquired rights. (3) National interests are best served by managing population aging in a framework that supports efficient use of both capital and labor.

Socioeconomic changes are a second main reason for reform. The public provision of retirement income for workers in the private sector originated in the late nineteenth century in the now developed countries—as a political response to urbanization and industrialization. Schemes were based on the model of a working husband with a spouse responsible for the household and children, with a high probability of becoming a surviving widow, a probability that increased with age. The first aim of pension systems was understandably to provide some relief to surviving children and widows. It is noteworthy that the minimum retirement age in Europe was originally set high in systems originating around 1900, typically 67–70 years, an age only a small share of male contributors could expect to reach. Typically, in the 1960s and 1970s, politicians capitalized on the shared interests of unions and management and lowered the pension age in many developed economies without paying attention to the long-term costs. This vogue proved to be short-lived, as all these countries began to tighten age and other eligibility requirements in the 1990s, largely with ad hoc adjustments in the rules. To date, there seems to be no known limit on the improvement in healthy years of life. This trend alone calls for a system design that provides incentives for workers to stay longer in the labor market as improvements in health and working conditions lead to longer healthy lives—improving the individual prerequisites for working when older, but also as the decline in fertility contributes to increase the demand.

Toward the end of the twentieth century, two additional socioeconomic changes have altered the landscape: rising female labor force participation and changing family structures. High female labor force participation, high rates of divorce, and the formation of new partner alliances call for a rethinking of benefits for widows—one of the *raisons d'être* of the nascent public schemes of a century ago. Although these changes are most pronounced in the postindustrial countries, they are increasingly a part of the picture in the developing world, too.

Globalization, with the increasing integration of markets for goods and services, factors of production, and knowledge, requires changes in the way public programs operate, including pensions. Such reforms are needed not only to reap the benefits of globalization but also to deal with the challenges it creates, including profound shocks resulting from technical innovations and shifts in the demand and supply of goods and factors of pro-

duction. This calls for pension systems that distort less decisions made on the labor markets; that support labor mobility across occupations, sectors, and countries; that are conducive to financial market development; and that support lifelong learning.

Against these diverse reform pressures, what are the promises of NDCs, and how are they put in perspective? But, before we get to these promises, very quickly: What is NDC? An NDC scheme is a pay-as-you-go scheme that by design mimics a financial defined contribution (FDC) scheme,³ and in doing so has many of the features of an FDC scheme. Individual contributions based on a fixed contribution rate are noted on individual accounts. Accounts are credited with a rate of return. Account values continue to accumulate as long as the participant works and pays contributions. There is no “full-benefit” age, but instead all new contributions enhance the size of the individual’s annuity once he or she claims it, or after a *minimum* pension age. The annuity is calculated by dividing the account balance with an estimate of life expectancy at retirement. Compared with an FDC scheme, the two most important differences are, first, that the internal rate of return in an NDC scheme is a function of productivity growth, labor force growth, and factors linked with contribution and benefit payment streams as opposed to “the” financial market rate of return. Second, the only financial saving that can occur is in the form of a reserve—or buffer—fund, as opposed to the prefunded character of FDC. The NDC buffer fund is necessary to save the surplus paid by larger cohorts to be paid out when they become pensioners, but the fund also has other buffer functions depending on specific system design.

Since the financial rate of return is generally expected to be higher than the rate of economic growth, NDC requires a higher level of contributions to achieve the same payout as an FDC scheme, and for this reason an NDC scheme is second best in economic terms. On the other hand, the appeal of NDC is that it does not involve the transition cost associated with introducing an FDC scheme where some form of pay-as-you-go arrangement already exists. NDC does not aspire to create financial saving, whereas FDC schemes may do this. Nevertheless, NDC can contribute *indirectly* to creating financial saving for retirement by clearly establishing the limit of the public pension commitment. NDC moves the focus to individual responsibility for providing for her- or himself in old age through work and accumulation of “funds” in individual accounts.

NDC has two desirable design features as opposed to the counterfactual design of a defined benefit scheme. First, NDCs are fair in the sense that two persons from the same birth cohort who make the same contributions into the scheme in the same period can expect to receive the same pension rights for these. Second, a generic NDC is, in principle, financially stable. The system is geared to maintain long-run equivalence between assets and liabilities at an unchanged contribution rate. This is accomplished in part through the dependence of annuities on life expectancy, in part by the fact that the internal rate of return reflects growth of productivity—and hence real wages—but also changing demographic conditions, the most important being declining fertility as propagated through the size of the labor force, and finally by designing the system to fulfill the long-term condition that assets be at least as great as liabilities.

As a result of these characteristics, a generic NDC promises to deal with the effects of the aging population more or less automatically and in the absence of political intervention. A generic NDC scheme maintains financial stability, with a given contribution rate, completely autonomously, based on legislated rules. It is accompanied by account information to participants, and a system financial statement can (should) be produced and made public annually. NDC provides no guarantee against political intervention, however, although it makes the results of political intervention more transparent than a conventional pay-as-you-go defined benefit scheme does. In practice, however, the transition

from the previous regime to NDC may place some restrictions on the full-fledged implementation of generic NDC. For example, there may be a “tax overhang” from the old system in the form of commitments politicians choose to honor, even though they might be inconsistent with the logic of the new NDC regime.

There are features of NDC that promise to make it particularly attractive in terms of effects on the labor supply. First, NDC contributions can be perceived by the individual as premium payments into an insurance system—that is, NDC is like a career savings plan that is illiquid until retirement and then pays out in the form of an annuity. Second, NDC rules—together with tax rules that provide equal treatment of pensions and earnings—are neutral in this sense on the work–leisure decisions of older workers. Third, NDC accounts are “infinitely” devisable, which means that it is only practical considerations that determine what percent of a full annuity an individual can claim at any time—after reaching the minimum pension age. Older workers can continue to work, but less, and can change their minds about how much, since an annuity can always be recalculated—and new contributions can be included in the calculation. Fourth, accounts can be shared between spouses or cohabiting couples. Fifth, NDC (like FDC), by basing benefits on individual accounts, makes labor mobility easy. In the NDC (and FDC) world it makes no difference for a pension in which occupation, branch, region, or country one works. Portability is possible by definition, and there are no benefit conditions that lock workers into specific employment situations. Finally, in economic environments where informality is prevalent, NDC rewards those who choose to participate in the formal economy. This being said, however, it is important to recall the importance of supplementing an NDC scheme with some form of “top-up,” which in very poor countries with a high degree of informality may be a main benefit for some time. What NDC provides in this context is an explicit structure for integrating an emerging formal sector into an earnings-related mandatory pension scheme.

In sum, NDC promises to address the issues confronting pension policy in the twenty-first century. How well it does this is the subject of this book.

The Structure of the Book and an Overview of the Contributions

The book is organized into two parts with two sections each. Part I presents the NDC concept and issues. Section 1 defines NDCs and focuses on conceptual questions. A set of broader conceptual, policy, and cross-country questions are the topics of section 2. Part II presents country experiences and prospects, with the chapters in section 3 reviewing the experience of countries that have actually introduced NDC schemes, while section 4 presents chapters on selected countries where NDC is being considered as an option for reforming the current defined benefit (DB) system.

Section 1 sets the stage for the book as it approaches the concept of NDC schemes from different angles as variations of a theme. The first chapter of this section defines generic NDC. It is intended to function as a “primer,” providing a common ground and putting everybody on the same page. The second chapter addresses what NDCs can bring to pension reform strategies, and the third chapter assesses NDCs from the perspective of welfare economics. Following this, there are three pieces that are written comments emanating from an ad hoc panel discussion organized at the conference in Sandhamn. It adds further light and also conceptual shades on the discussion about the nature of NDCs and their role in pension systems and reforms.

Chapter 2, by *Edward Palmer*, sets the stage by defining a “generic NDC.” He establishes and discusses a set of conditions characterizing a generic NDC scheme. As noted above,

NDC is like an individual saving scheme in which contributions on earnings are paid into an account, but NDC follows the principle of pay-as-you-go—that current contributions of workers finance the pensions of current retirees. An essential micro condition defining NDC is that the value of an individual account at any time is the present value of the participant's pension entitlement. The macro condition of NDC is that assets must be at least as great as liabilities, a condition that can be fulfilled in practice in a number of ways, which are discussed in the chapter. The chapter also discusses NDC in an intra- and inter-generational distributional context and examines the possibility of sharing accounts between spouses.

Chapter 3, by *Axel H. Börsch-Supan*, presents first the basic ideas underlying NDC systems and discusses their main advantages and disadvantages. He argues that an NDC system is mainly a political device. It makes parametric reform, badly needed to stabilize the pay-as-you-go (PAYG) pillars all over the world, easier because it exposes the trade-offs and clarifies concepts. It may also change the microeconomics of labor supply and savings. It does not, however, change the macroeconomics of PAYG systems and thus does not substitute for the introduction of prefunded second and third pillars. NDC systems can be installed as individual account systems, as is done most prominently in Sweden. However, Börsch-Supan argues that they can also be mimicked by a set of rules in a conventional defined benefit PAYG system, showing that NDC systems are more a political than an economic device. The second part of his chapter claims that the German pension reform proposals made in late summer 2003 effectively introduced an NDC-like system without explicit NDC-type accounting.

Chapter 4, by *Nicholas Barr*, offers an assessment of NDC pensions from the perspective of welfare economics, in terms of three questions: Is the particular feature an advantage? If so, is the advantage inherent in NDCs or could it be achieved by other arrangements? And is the advantage one of policy design or of political reality? The chapter argues that NDC pensions can facilitate desirable design features such as a flexible retirement age and automatic adjustment to rising life expectancy, enhance the ability to cope with risk and uncertainty, assist sustainability, enhance transparency, and reduce incentives to fraud. It also argues, however, that these advantages are not the sole property of NDCs, but could be achieved by other designs. The chapter goes on to discuss equivocal aspects of NDC pensions and their disadvantages. The final section offers three strategic conclusions: First, NDC pensions are not a theoretically dominant policy—they are *a* policy reform, not *the* policy reform; second, NDC schemes can take many guises—the case for NDCs is strongest as part of a wider pension system, rather than as a stand-alone design; third, NDC pensions do little to address the fundamental cause of unsustainability—the fact that earliest pensionable age is not related to life expectancy.

The presence of *Peter Diamond*, *Assar Lindbeck*, and *Salvador Valdés-Prieto* at the conference suggested the creation of a panel on the conceptualization and position of NDC among alternative pension systems. Their written contributions in chapter 5 emanate from this discussion and provide highly valuable insights into the conceptualization of pensions and the position of NDCs among alternative systems. All three start with the three-dimensional classification developed in Lindbeck and Persson (2003): (1) funded versus unfunded systems, (2) actuarial versus nonactuarial systems, and (3) DB (defined benefit) versus DC (defined contribution) systems. But they differ importantly on the interpretation of these characteristics and the position of NDCs in the spectrum of pension system. Although all three give the NDC system pretty good overall grades, they see also virtues in alternative system designs and put up a warning flag about “overselling” NDC.

Section 2 covers a broad spectrum of conceptual and policy questions related to reform needs and NDCs, including the role of demographics in pension systems, the internal rate of return in NDC, conversion from a PAYG-DB scheme to NDC, cross-country considerations such as the usefulness of NDC as a coordinated European pension system or the applicability of NDCs for middle- and low-income countries, and the politics of NDC pension reforms.

Chapter 6, the opening chapter of this section, by *Juha M. Alho, Jukka Lassila, and Tarmo Valkonen* approaches NDC by examining some of the demographic and economic “shocks” with which a generic NDC design would be confronted, but without applying all the tools of a truly generic NDC scheme. Hence, the chapter serves to illustrate the problems confronting the pension system reformer. The chapter combines stochastic population simulations with economic models, providing us with a new way to think about the sustainability of public welfare systems. The chapter discusses the expected change in the age distribution of Europe and consequences for Europe’s pension systems. In addition, using four country examples, the authors demonstrate how demographic risks can be shifted in time and between groups.

Chapter 7 by *Ole Settergren and Boguslaw D. Mikula* presents a method for calculating the internal rate of return in PAYG pension systems in general. This generic method is most easily applicable in NDC schemes. They demonstrate that, in addition to the rate of growth of average covered earnings and the number of covered persons—as would be the case in a steady state—a third factor becomes important. This is the time structure of contributions and pension payments, which is labeled the *turnover duration* (TD)—the expected money-weighted average time from contributing to the system to receiving the pension. They show that at any given time assets can be valued as the product of the TD of contributions in the system and contributions actually paid in the period evaluated. Liabilities in the NDC scheme are the current value of all obligations. With the TD valuation of assets it is possible to estimate the (implicit) asset side of the balance sheet, making it possible to determine the ratio of assets in a given period over liabilities, that is, to determine whether the pension system fulfills the condition of financial balance.

Salvador Valdés-Prieto presents an alternative balancing mechanism to the Swedish automatic balancing mechanism (ABM) in chapter 8. When NDC design was adopted in the early 1990s it was known that, in addition to responding to the rates of growth of productivity and the labor force, NDC liquidity would be affected by the timing of payments—by the age-earnings distribution of contributions and age distribution of payments. Yet it was not clear initially how this knowledge could be incorporated into the formulas. Swedish policy experts responded to this challenge by formulating how the internal rate of return in a PAYG system could be represented, and using this knowledge, created the ABM, which is used to secure financial balance. This chapter proposes an alternative to the ABM that also endows NDC plans with automatic financial stability in the short run. This method is labeled integration to financial markets (IFM). In contrast to the ABM, the IFM proposal is based on financial-market-determined discount rates and trade of uninsurable risks with market investors, that is, agents who are neither participants in the scheme nor taxpayers. Relative advantages and risks of the IFM and the ABM are discussed.

Chapter 9 by *Edward Palmer* reviews the issues arising in converting a PAYG-DB scheme to an NDC scheme and presents models for conversion. The first one is based on the NDC formula and the second on the acquired DB rights. Adhering to the NDC formula requires (1) establishing how to approximate past earnings if there is not complete information; (2) what contribution rate should be set for past earnings if it is not to be the rate looking forward after the implementation of NDC; and (3) what the imputed rate of return on past

contributions should be. The chapter also discusses how countries introducing NDC have dealt with acquired rights (including special privileges where they have existed), and how other components of DB schemes for low-income recipients' noncontributory rights and disability and survivor benefits are handled in conversion to NDC. Speed of transition and the consequences of complete and immediate transition (as in Latvia) contrasting with slow transition focusing largely (Italy) or solely (the Kyrgyz Republic) on new entrants are discussed. Slow transitions protect acquired rights in the old system, but are counterproductive in terms of the policy goals of the new NDC system. The balance of pros and cons, it is argued, favors rapid transition.

Florence Legros discusses similarities and differences between NDC and the French and German point systems in chapter 10. She focuses on how these systems differ when there is an external shock (demographic, economic, and so on) and discusses the possible consequences of moving from the point system to NDC. The French point system—with no automatism in its indexing device—can be regulated each year according to the forecasts. Legros concludes that this may be the best way to react to changes in the economic and demographic environment—but to do this also requires, first, reliable and frequent forecasts, and second, a total independence of the governing board of the scheme from the retiree and worker lobbies. She notes that although the second point can be handled with rules, as opposed to the present state of affairs, it is questionable whether the first point can be fulfilled. Germany has adopted a method to correct the excessive generosity of the scheme with what she calls a “return spring”—a mechanism in which the pension yield is lowered in relation to a desired contribution rate. This mechanism is reinforced by the “Rürup sustainability factor,” which explicitly introduces the dependency ratio and accounts for life expectancy changes. She notes that with this strategy it is probable that the German scheme will move into surplus within some years, allowing for a reserve that might be needed for intergenerational transfers. She concludes by asking the question Why introduce NDC? Her answer is that FDC schemes promote individual responsibility while NDC maintains the principle of social cohesion in public pension schemes.

In chapter 11, *Robert Holzmann* (1) reviews the reform needs of pension systems in the member countries of the European Union for fiscal, economic, and social reasons; (2) makes the case for a move toward a more coordinated pension system in Europe; and (3) sketches what such a system may look like and how it may come about. The central claim and content of the chapter is that a multipillar system, with an NDC system at its core and coordinated supplementary funded pensions and social pensions at its wings, is an ideal system to deal with diverse fiscal and social reform needs. The approach would permit introducing a harmonized structure while allowing for country-specific preferences about coverage and contribution rate. Although the chapter focuses on the European Union, the arguments and proposed structure for a more harmonized system with some autonomy for subnational entities are also valid for other countries or integration areas such as China or Mercosur.

Chapter 12, by *David Lindeman*, *David Robalino*, and *Michal Rutkowski*, discusses the suitability of NDC for middle- and low-income countries. Much of the policy discussion to date so far has been focused on high-income countries such as Sweden and Italy. The authors' point of departure is the observation that middle- and low-income countries are characterized by less stable macroeconomic environments, a narrow and highly sensitive contributory base, a more uneven income distribution than in developed countries, and, in addition, they are often in the midst of a demographic transition. The chapter focuses on the general macroeconomic, demographic, and institutional variables that can affect the application and performance of the NDC concept. The chapter discusses the primary ben-

efits from adopting the NDC concept in middle- and low-income countries in terms of reducing economic distortions and improving financial sustainability of PAYG pension schemes. The chapter identifies initial conditions and design factors that are likely to influence the realization of these benefits. It also addresses implementation issues, redistribution and poverty, institutional capacity requirements, and the political economy of NDC schemes in the middle- and low-income setting.

The point of departure of chapter 13 by *Annika Sundén* is that the shift to defined contribution schemes increases the need for general financial literacy. Both NDC and FDC schemes put more of the responsibility and need to plan for retirement on the individual participant. Studies of what people know indicate that they have poor knowledge about the conditions that determine their benefits, and that learning about pensions is difficult. This chapter discusses what people need to know and what surveys show they know, using data gathered for the new Swedish NDC scheme. The chapter concludes that information and education leading to participant understanding of the scheme and, generally, improved pension literacy is important, and that pension system design that makes understanding easy is important. The latter provides an argument against complicated rules, for example the rules for conversion to NDC that affect different cohorts or persons in the same cohort differently, and a need to create an understanding of the basic logic of NDC.

Chapter 14 by *Sarah M. Brooks and R. Kent Weaver* focuses on the political aspects of NDC. It begins by listing the positive policy arguments for NDC compared with the counterfactual policies of PAYG-DB and FDC schemes. The authors argue that the impression of “property rights” that NDC conveys has the negative feature of creating a “lock-in” effect. In the words of the authors, proponents argue that the political advantage of NDC is that it “absolve[s] politicians of responsibility for potential future benefit reduction,” for example due to an aging population. Put differently, in adopting NDC, governments “lash themselves to the mast.” The chapter addresses two questions: First, is NDC reform more likely to get onto the reform agenda in countries with certain characteristics? Second, does NDC really have the potential to absolve politicians of their responsibility, or will NDC schemes eventually spark resistance that undercuts their intended effects?

Section 3 contains a set of chapters that review the experience of countries that have actually introduced NDC schemes; more specifically these are countries that have reformed traditional non-financial—that is, PAYG—defined benefit (NDB) systems into an NDC system. The country set includes all the reform countries of a fully fledged NDC system: Italy, Latvia, Poland, and Sweden. Italy is even represented with two chapters.

Edward Palmer, Sandra Stabiņa, Ingemar Svansson, and Inta Vanovska present and analyze the Latvian NDC reform, which was implemented on January 1, 1996, in chapter 15. This was the first, and to date is the only, NDC reform covering *all workers from the first year of implementation*. The most difficult design issue was the conversion of rights acquired in the old scheme into NDC rights, because there were only historic service records and because the transition occurred during a period of general economic upheaval in the early years of transition. The pros and cons of the method chosen are discussed. The chapter also presents financial calculations for the coming three-quarters of a century under a variety of extreme economic and demographic assumptions. Initially, the NDC contribution rate was 20 percent, but the overall rate of 20 percent is being successively redistributed to an FDC scheme with a rate of 10 percent by 2010. The chapter illustrates the impact of moving into the financial account scheme and reducing the NDC rate to 10 percent. The introduction of the FDC scheme requires a tax to finance previous NDC commitments made with NDC contribution rates above 10 percent. Alternative estimates are provided for a less ambitious financial account pillar with a contribution rate of 6 percent rather than the sched-

uled 10 percent (leaving 14 percent for the NDC scheme). The chapter also shows that the NDC scheme per se is financially robust under a large variety of assumptions, even with the pessimistic assumption that the working-age population will decline by 50 percent in the coming half decade. The authors stress that the system design needs to be completed by formally implementing the reserve fund and producing more comprehensive financial accounts, including the tax-financed debt to the NDC scheme accompanying the introduction of the FDC scheme.

Chapter 16 by *Marek Góra and Agnieszka Chłoń-Domińczak* presents the new Polish pension system, which was introduced under the banner of “Security through Diversity,” on January 1, 1999. It automatically replaced all previous legislation on old-age pensions for the majority of the working population as for all persons under age 50 in the year the reform the new scheme was introduced. The chapter presents the design of the Polish NDC scheme in the context of the framework of the entire pension system implemented in 1999, and it assesses the early experiences with implementation and discusses the future of the NDC pension system in Poland. The chapter also presents financial calculations over the coming 50 years, showing that the system moves into balance from a point of departure of substantial imbalance—and this is helped along by a gradual formalization of the economy that for a couple of decades counteracts a gradual fall in the working-age population. Though the general design of the Polish NDC scheme has remained unchanged, some elements of its original construction have become a subject of debate. One of the most important is the decision in the original legislation to allow women to retire at age 60, while men retire at age 65. In addition, the reform left farmers outside, which is likely to create a coverage problem for this segment of the population as they integrate into the formal economy. A major lesson to be drawn from the Polish experience is that the implementation needs good administrative support if major problems are to be avoided.

Chapter 17 by *Bo Könberg, Edward Palmer, and Annika Sundén* presents the Swedish NDC experience. The Swedish pension reform dates back to the summer of 1992 when the Parliamentary Working Group on Pensions published a “sketch” containing almost all the essential elements of the reform. In June of 1994, the Swedish parliament passed the reform legislation that was to be the Swedish NDC scheme. Implementation began in 1995 and moved forward in stages. This chapter discusses how the Swedish reform came about, what it is, its public image, and remaining issues. A driving force behind the creation of the Swedish NDC scheme was the goal of creating financial stability while using contributions per capita as the rate of return on accounts. This led to the creation of the automatic balancing mechanism (ABM). The authors discuss the fact that one of the remaining challenges is to create a popular understanding that the ABM is simply a component of the rate of return on NDC accounts. The authors highlight the idea that the potential risk for the autonomy of the system is the very mechanism that was designed to create autonomous financial balance—the ABM. They conclude by reflecting that Sweden had already accumulated large reserves in the old system to meet the demographic burden of the post-war baby boomers, which will help to provide payments when both the boomer and next boomer generation—the children of the postwar boomers—retire. This puts Sweden in a very favorable position compared with many countries considering introducing NDC. Calculations show that demography will stress finances in the 2040s, and this will be taken into consideration in solving the remaining problem of “balancing”—a method of determining when reserves are large enough to allow them to be distributed to the then-living participants. Finally, the authors conclude that what remain to be examined in greater depth are the implications of the construction of the balancing mechanism for the intergenerational distribution of resources.

The first case study of Italy is presented by *Daniele Franco and Nicola Sartor* in chapter 18. Since 1992, reform of the pension system has been at the core of the effort to consolidate Italian public finances. The reform process began in 1992 when a quarter of prospective public sector pension liabilities was abruptly cancelled. A second major reform in 1995 introduced NDC, but beginning with new entrants and with a pro rata formula for persons with fewer than 18 years of coverage. The authors provide and discuss empirical evidence on the results of the reform and conclude that the reform process is not yet finished. According to their analysis, further adjustments are required to: (1) accelerate the introduction of notional accounts; (2) avoid increases in the ratio of pension expenditure to GDP; and (3) strengthen the self-equilibrating mechanisms of the new pension regime, such as by moving to an annual revaluation of the life expectancy factor used in calculating newly granted NDC annuities. In the view of these authors, present problems derive from the fact that the 1995 reform was implemented without an extensive analysis and an open public debate. The lengthy and incremental process associated with the “unfinished reform”—following the first stage in 1992—has generated uncertainty, and, according to the authors, may limit the microeconomic benefits of the approach embodied in NDC. New reform proposals discussed after 1995 do not explicitly call into question the 1995 reform, but, generally, they have not been consistent with its underlying philosophy. The authors conclude that the future of NDC in Italy is therefore uncertain.

The second case study on Italy by *Sandro Gronchi and Sergio Nisticò* in chapter 19 compares the Italian and Swedish reforms. The point of departure is a theoretical framework that highlights the implications of the different ways in which Italy and Sweden implemented the NDC model. In particular, this chapter focuses in depth on the real growth norm factored into the life annuities in the Italian and Swedish NDC schemes—a feature no other country has implemented. The chapter is unique in providing an analysis of this feature. Like the Swedish annuity, the Italian annuity contains an economic growth factor—in Italy’s case, a real growth factor of 1.5 percent per annum over the life of the annuity (in Sweden it is 1.6 percent). The main conceptual defect of the “Italian-style” NDC scheme is that the indexation of pensions should reflect the difference between the sustainable rate of return (with GDP growth as a proxy) and the value of 1.5 percent used in calculating annuities, which is the case in Sweden. The absence of this correction jeopardizes the objectives of sustainability and fairness. Other shortcomings and inconsistencies of the Italian reform are discussed. The authors conclude that, although blueprints have been available since 1995, successive governments have not taken the necessary step to form a committee of experts with a mandate to “bridge the gap between the theoretical foundations of the NDC scheme and the countless details that implementation would inevitably bring.”

Section 4, the last section of the book, presents case studies for countries that are thinking about introducing NDC systems, or, at least according to the authors, should have a close look at NDC approach as a promising option for reforming the existing PAYG system. As to be expected, some country considerations are more advanced than others. Five country studies are presented: Austria, the Czech Republic, Germany, Spain, and Japan. The characteristic of all country cases is the size of the inherited Bismarckian-type retirement system, which ranges between 9 percent (Japan) and 15 percent (Austria) of GDP; the piecemeal approach of past parametric reforms, which has failed so far to put the public pension schemes on a sustainable basis; and implications of introducing NDCs for benefit levels for a given retirement age.

Austria competes with Italy, Poland, and Uruguay for the “world championship” in public pension expenditure. All countries have expenditures close to 15 percent of GDP,

but some contenders start to fall back in the race as they have reformed their system (such as Poland). So far Austria is leading the race. Recent reforms have helped to reduce the sustainability problem but will not solve it, as is discussed in chapter 20 by *Bernhard Felderer, Reinhard Koman, and Ulrich Schuh*. This study demonstrates the impact of different scenarios on expenditures, revenues, and replacement rates through 2050. They present new evidence that confirms the need for a more fundamental reform of the Austrian pension system. In a second part, the chapter investigates the potential effects of moving from the current NDB to an NDC system. The results indicate that an NDC reform can put the public scheme on sustainable basis, but the arithmetic of pensions that the NDC approach forces to light exhibits the impact on replacement rates: For men, replacement rates would be reduced from some 80 percent (if unchanged but unsustainable) by some 20 and more percentage points (depending on the labor force scenario); for women, the replacement rates would be reduced from some 50 percent by similar dimensions. Based on these sobering calculations, the authors recommend introducing an additional fully funded, mandatory second pillar to a reformed NDC scheme to provide acceptable benefit levels for future retirees.

The Czech Republic shares many features with its southern neighbor, including the historical origins of the pension system. According to UN population projections,⁴ population aging is projected to be even more pronounced than in previous projections and the Czech Republic—together with Greece, Italy, and Spain—is expected to have the highest share in the population of people 65 and older by 2050. The projected pronounced population aging in the coming decades makes a reform of the Czech pension system even more important to avoid a future financial crisis. Although various reforms have been undertaken in the course of 1990s, they are not sufficient to create financial stability, making more significant changes even more necessary. The authors of this case study (chapter 21)—*Agnieszka Chłoń-Domińczak and Marek Mora*—review the reform options and conclude that a move toward a mandatory funded pillar does not seem a viable option, as public finances would not be able to bear the costs of transition financing. Also, following relatively poor performance of the voluntary pension funds, there is little support among the politicians and the society generally for introducing a funded pension system. On the other hand there is increasing political resistance to another round of parametric reforms. Against this background the introduction of an NDC scheme provides a framework that joins the microeconomic incentives of the funded system with PAYG financing that does not imply transition costs. The chapter analyzes NDC as a viable option for reforming the Czech pension system, with particular focus on advantages and disadvantages of such an option from the perspective of the Czech Republic. The financial simulations that complement the analysis show that a mere move from the current two-tier PAYG system to an NDC scheme does not lead to financial sustainability. Such a move would have to go hand in hand with other changes, such as an increase (and equalization) of retirement ages for men and women and lower pension indexation.

Germany still has a very generous public PAYG pension system. It is characterized by early effective retirement ages and very high effective replacement rates. Most workers receive virtually all of their retirement income from this public retirement insurance. Costs are almost 12 percent of GDP, more than 2.5 times as much as the U.S. social security system). The pressures exerted by population aging on this monolithic system, amplified by negative incentive effects, have induced a reform process that began in 1992 and is still ongoing. This process is the topic of chapter 22 by *Axel H. Börsch-Supan and Christina B. Wilke*, and they proceed in two parts. The first part describes the German pension system as it has shaped the labor market until about the year 2000. The second part describes the

three-staged reform process that will convert the exemplary and monolithic Bismarckian public insurance system after the year 2000 into a complex multipillar system in which the PAYG pillar will emulate an NDC system. The chapter assesses how far these reform steps will solve the pressing problems of a prototypical PAYG system of old age provision, it is hoped with lessons for other countries with similar problems.

Spain is another European country with pronounced projected population aging as a result—as elsewhere—of increasing life expectancy, but mixed with one of the lowest fertility rates in the world. Chapter 23 by *Carlos Vidal-Meliá and Inmaculada Domínguez Fabián* has two goals: first, to provide an objective technical assessment of the current situation of the contributory pension system in Spain and its prospects for the future, and second, to look at the issues surrounding the introduction of a system of notional defined contribution accounts. To this end the chapter sketches the basic elements upon which the current system is based, and highlights its main indicators before discussing some of its fundamental problems. These problems include equity issues resulting from highly unequal implicit rates of return in the different pension schemes organized according to occupational affiliation. The review of the set of forecasts of Spanish researchers and institutions all confirm the financial unsustainability of an unreformed system. When investigating the usefulness and applicability of the NDC approach for Spain (and its largest subsystem), the chapter has two interesting twists. It compares the replacement rates (and internal rates of return) of the current scheme with that of alternative NDC implementations using Spanish data. The reference benefit formulas are reforms in Sweden, Italy, Brazil, Poland, and Latvia. The result shows variations across the different benefit benchmarks, but across all benchmarks are clear signals that the current Spanish benefit formula is totally unsustainable because it is much too generous. As a second twist, the chapter takes an alternative realization of potential notional interest rate options for contributions and pensions and suggests which formula or group of formulas would best fit the profile of contributor-beneficiary risk and what the transition process would be.

Japan already has the oldest population in the world. Since 2001, the income statement of the principal pension program has turned into a deficit. Increasing drop out has been observed from the basic old-age income protection for nonsalaried workers. The generous pension program has to be reformed to be much more incentive-compatible. In this little note (chapter 24), *Noriyuki Takayama* claims that a reform of the Japanese PAYG system toward a Swedish-type NDC system would very much help Japan overcome a number of problems in its current schemes, including problems of incentive-compatibility. Japan faces the additional specific challenge of handling huge excess liabilities resulting from entitlements of past pension contributions, equivalent to 130 percent of GDP in 2004. If Japan were to move to an NDC system, the chapter suggests handling this legacy problem of excess liability through a budget mechanism such as an earmarked consumption tax or transfers from the general budget.

Summing Up and Research Outlook

As is evident from the summary of the contents of this book, the NDC conference held on the island of Sandhamn outside Stockholm resulted in a very rich conference producing important contributions on the topic of NDC. The contents of this book should be helpful for countries that want to investigate this approach to reform an NDB pillar that is not working, to readjust weights between unfunded and funded pillars, or to introduce an NDC scheme as the foundation, perhaps with a mandatory public and/or a private FDC scheme on top. NDC is worthy of a country's examination as a means of dealing with the

financial instability accompanying the aging of the population. It provides a framework for dealing with most of the demands on a modern pension system. In some environments, it may be the best alternative where conditions are not ripe for the introduction of a financial account scheme.

The rich conference outcome provides some answers but, as should be expected, also poses many more questions that require the attention of policy makers and researchers. In addition, the relatively short experience of the little more than a handful of countries that can claim to follow an NDC-type approach is simply too short to draw strong conclusions. Nevertheless, there was definitely a clear agreement among the diverse group of researchers and policy makers at the Sandhamn conference that all countries are invited to have a close look at the NDC approach as a viable option for dealing with the diverse reform pressures of their pension schemes.

Against this background, we make no attempt to provide a detailed concluding summary. This said, there are three main themes that run across all the chapters. These lead to some conclusions, while at the same time they suggest questions for future research.

First, the conference outcome suggests that the conceptual promises of an NDC reform, in particular that of financial sustainability, can be fulfilled. Yet, as with other reform approaches, the challenge is in its implementation. More specifically, the experience of NDC reform countries suggests that NDC is not a foolproof approach, and it needs to be politically well managed. As in other reforms, communication with the stakeholders of the reform to get their buy in is crucial, and administrative preparedness is also crucial. The limited country experience also suggests that faster transition from the inherited DB system may have major advantages. Although the *concept* of the balancing mechanism intended to achieve financial sustainability seems to have been understood and embraced by experts, it may be difficult to implement, both for technical (data quality) and political reasons. In the one country where the automatic balancing mechanism has been implemented—Sweden—there is still no experience of the possible political repercussions of automatic balancing. But, perhaps most importantly, too little thinking has been given to the issue of “tax overhang,” that is, the need for additional fiscal resources or reform measures to deal with transitory deficit resulting from past commitments that are not covered by the fixed NDC contribution rate.

Second, the short time period since the introduction of NDC (the longest period is nine years in Latvia) and interaction with other reform measures has not allowed for careful assessment of the economic effects of NDC reforms, and the distributive effects have not figured prominently in the political and academic discussions. As a result, too little is known, especially about the intergenerational distributive effects, and very little attention has been devoted to dealing with the spouse pension. We still have very little empirical evidence about the promised effects on labor supply, in particular the retirement decision, although the limited evidence from reform countries looks promising. As a result we do not know if individuals faced with a lower pension at early retirement age do sufficiently postpone their retirement decision or draw on a much lower pension, and how much this is influenced by overall system design issues (such as the minimum pension guarantee) or constraints imposed from outside the system.

Last but not least, there was a shared feeling at the conference that NDC schemes must be assessed as part of a broader (multipillar) pension concept and not (only) viewed in isolation. An issue that needs to be given more attention is the question of how to integrate occupational schemes into the overall pension framework. This may be relatively easy for, say, pensions of civil servants, but it is likely to require more thinking for, say, farmers or persons involved in the informal or semiformal agricultural setting in developing

economies. As NDC systems apply the logic that benefits depend only on one's own contributions, and with life expectancy determining the size of the life benefit, for any given contribution rate and retirement age the benefit level will be lower—perhaps markedly lower—than under the old NDB scheme. Individuals may compensate with later retirement but they may also compensate with more individual savings—but in what form (mandated, voluntary), with what instruments (financial assets, annuities), under what form of supervision, and so on? Hence, opting for an NDC scheme also requires having a game plan for the (second or third) supplementary pillars, and there are many issues involved. What's more, as the NDC scheme has no distributive aspirations, the choice of overall framework also requires paying attention to the needs of basic income support to the needy elderly in a way that achieves the social objective while not unduly compromising the expected behavioral effects of NDC.

That we can pose these and other research questions at all, or at least much more clearly, is the result of the conference and of the chapters in the book. Enjoy the reading!

Notes

1. See Holzmann et al. (2005).

2. "Non-financial defined contribution" and "notional defined contribution" are used interchangeably in this book and should be understood to have the same definition.

3. Note that we adopt the terminology presented in Góra and Palmer (2004) that distinguished between defined benefit and defined contribution schemes on the one hand, and financial and non-financial schemes on the other. A *financial scheme* is a scheme the assets of which are held in financial market instruments, and a *non-financial scheme* is a scheme in which the assets are the fewer contributions of workers. This gives four distinct categories of pension schemes: Financial defined contribution (FDC), financial defined benefit (FDB), non-financial defined contribution (NDC) and non-financial defined benefit (NDB). FDC is what is called individual account schemes in some of the pension literature. Since NDC is also an individual account scheme, it seems more appropriate to distinguish between the financial and non-financial aspects of these in choosing the nomenclature.

4. See UN (1998).

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