

LATEST TRENDS IN ASSESSING PENSION REFORMS

Larisa Bule, University of Latvia

Inna Romanova, University of Latvia

Ramona Rupeika-Apoga, University of Latvia

Abstract. Old age pension provision constantly creates an increasing financial pressure on most of the EU countries, therefore some of European countries are in a further stage or reforming pension system, others already completed transformation and became an object of analysis and surveillance for researchers and policymakers.

Over the years attitude towards the role of pension system in economy changed significantly from simple provision of retirement benefits and income distribution to indisputable contribution to a very wide range of economic, social and other processes. Nowadays pension system is supposed to be the instrument of impact and all reforms, even parametric, have a consequent effect on work and tax incentives, welfare, consumption, demographic indicators, etc. Some of the results are well studied, e.g. income distribution, other outcomes, for example society's radicalisation, only recently have become a subject of research.

The aim of this study is to provide an overview of latest scientific approaches to the estimation of various effects of pension system's reform including the influence of parametric corrections. Scientific papers of Latvian and foreign researchers have been considered, systemized and characterised according to the main idea of research. The study provides conclusions on the extent of research on different effects and points out the most actual and up-to-date directions of scientific activities. The results of this study can be implemented for identifying the most untapped area of research, for further investigation and for the assessment of reform from the perspective of the newest scientific achievements.

Key words: *pension system, reform assessment*

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Introduction

Nowadays the effectiveness of pension system as well as necessity of pension system reforming is getting more and more topical. Over the years the role of a pension system has changed from the simple provision of retirement benefits as a secure source of income to the important instrument contributing to a wide range of economic, social and other processes. Effective pension system is often related to country's future ability to grow and maintain adequate standard of living having impact on work and tax incentives, welfare, consumption, demographic indicators. On the other hand, pension funds (including private pension schemes) are important institutional investors providing long-term investment necessary for future growth of economy.

Therefore, financial sustainability of pension system is vitally important for economic development of any country. Nowadays, the biggest challenge for the majority of pension systems globally is higher life expectancy and therefore the necessity to pay pension benefits much longer than initially expected when creating the system. According to the World Bank data, life expectancy after retirement age for 2050 is estimated to be by 15-20 years longer as forecasted in 1960

(World bank, 2018). This worsens the pension gap that is expected to grow at 5% annually (2015-2050) (World Economic Forum, 2017).

Thus, due to current demographic trends: longer life expectancy, lower fertility rates and aging population, pension systems in many countries create additional financial pressure for public finance.

Moreover, according to the Report on European Private Pension Schemes (Financial Stability Board, 2017), aging population is one of the disincentives to accumulate savings for pension, potentially increasing current aggregate demand and decreasing demand in future.

Many countries are undertaking various reforms, restricting eligibility criteria, reducing pension benefits or tighten in linking benefits to contribution, increasing employment rate of older workers etc. Therefore the need for reliable models of reform assessing becomes more and more relevant. The aim of this study is to provide an overview of latest scientific approaches to the estimation of various effects of pension system's reform including the influence of parametric corrections.

1. Main Goals of Pension System Reform

Ensuring the successful design and delivery of old-age pensions is complex. According to Barr (Barr, 2013) pension systems have multiple objectives. For the individual or family, the major ones are:

- Consumption smoothing, i.e. redistribution from one's younger to one's older self. Pensions should allow a person to transfer consumption from his/her productive middle years to the retirement years, allowing to choose the preferred time path of consumption over working and retired life.

- Insurance: in a world of certainty, individuals save during working life to finance their retirement. However, people do not know how long they are going to live. Thus a pension based on individual savings faces the person with the risk of outliving own savings. The purpose of annuities (fixed stream of payments created by financial institutions) is to allow people to insure against that risk. Pensions can also insure against disability, and can protect spouses and young children should a worker die before retirement.

According to the public policy pension system has additional objectives:

- Poverty relief: the relief is necessary in case when person's earnings record does not provide an adequate pension.
- Redistribution: it can be achieved by paying pensions to low earners that are a higher percentage of their previous earnings, thus subsidising the consumption smoothing of lower earners. Since life-long earnings are uncertain, such a system provides some insurance against low earnings. There can also be redistribution towards families, for example paying a higher pension to a married couple than to a single person.

Therefore the majority of pension reform studies are devoted to considering reform's prospective to attain those goals or affect current situation.

In most of the post-World War II period, many countries have given greater relative weight to the primary individual objectives of insurance and consumption smoothing. Such an outlook has favoured the development and global diffusion of different defined benefit models. In the last decades of the twentieth century, however, in developed and developing countries alike, increasing attention was given to the secondary public policy objectives. This essentially economic outlook may be deemed more favourable to developing and diffusing defined contribution models (Bloom & McKinnon, 2013).

Assuming that reforming should improve pension system's ability to achieve the previously mentioned goals, the objectives of reform might be stated in many different ways. OECD has formulated the key goals of pension reform as follows:

1. Pension system coverage in both mandatory and voluntary schemes.
2. Adequacy of retirement benefits.
3. The financial sustainability and affordability of pension promises to taxpayers and contributors.
4. Incentives that encourage people to work for longer parts of their lifetimes and to save more while in employment.
5. Administrative efficiency to minimize pension system running costs.
6. The diversification of retirement income sources across providers (public and private), the three pillars (public, industry-wide and personal), and financing forms (pay-as-you-go and funded).

A seventh, residual, category covers other types of change, such as temporary measures and those designed to stimulate economic recovery (OECD, 2013).

Currently, the need to address all objectives of old-age pension systems is generally accepted, as is the expectation that these objectives may be best achieved by using different elements in a composite approach to pension system design (Bloom & McKinnon, 2013).

Most of pension reform studies have been and still remain devoted to previously mentioned goals. Some of studies investigate an optimal way of achieving selected goals, others are more universal. The extent of research is so very broad, that it is not possible to systemize all studies, therefore only the main directions are going to be considered.

2. Development of Pension Reform Studies

First studies dedicated to pension reforms appeared in the second part of the 20th century. J.M.Orszag, S.Valdez-Prieto, N.Barr, P.Diamond, P.Orszag, Z.Bodie, E.Palmer, R.Holzmann, A.Lindbeck and M.Persson are seen as the founders of pension research and their works are still most frequently cited. However, the opinion on global pension systems and their reforms since the early 1990s has changed significantly over time.

In 1990s and even in the beginning of the 21st century most studies appear to have been driven mainly by a desire to reduce projected levels of future spending on state pensions (World Bank, 1994), (Disney, 2000), (Hauner, et al., 2007), (Schneider, 2009). Mentioned approach is usually criticized but still stays rather topical and even dominating as far as pension system's financing is one of the main problems at present and will become even more dramatic in future.

At the end of the 20th century the future for pension systems for some experts and policy makers appeared quite promising and fairly certain once the initial crisis was overcome. In 1994 the World Bank presented the multi pillar pension system model, which seemed to be a universal solution because of: transferring main parts of retirement income provisions from the public sector to the private sector (1) to address fiscal unsustainability and projected further population aging and (2) to accelerate financial market development expected to trigger higher economic growth to co-finance some of the transition costs (World Bank, 1994). World Bank's study, "Averting the Old Age Crisis", provided an invaluable service in drawing attention to this problem and in discussing specific policy changes to address the issue. A number of emerging European economies reformed their pension systems in the late 1990s and early 2000s by adopting multi-pillar pension frameworks. Pension reforms were anticipated to improve the long-run fiscal sustainability and lead to better macroeconomic outcomes, including higher national saving rates and increased labour participation. An important part of the reforms was the introduction of a private, in most cases mandatory, pre-funded, defined contribution second pillar pension system. This private component, in conjunction with the public first pillar, was expected to help to diversify risks, supplement old-age income for pensioners that was being tightened under the public pension schemes, and help with the development of capital markets (Velculescu, 2011) (Vojskis, 2008).

These suggestions have come to be viewed narrowly - focusing on a second pillar limited to a private, non-redistributive, defined contribution pension plan. The most recent reassessment of pension reforms has been provoked in 2007-2008 by the ongoing global financial crisis and its consequences for funded and unfunded pensions.

Already in 1999 P.R.Orszag and J.E.Stiglitz reported, that most of the arguments in favour of this particular reform are based on a set of 10 myths, that are often not substantiated in either theory or practice (Orszag & Stiglitz , 1999). The authors divided ten myths into three broad areas: macroeconomic effects; microeconomic efficiency; and political economy. The myths in each area were:

- 1) Macroeconomic myths:
 - a. Myth #1: Individual accounts raise national saving
 - b. Myth #2: Rates of return are higher under individual accounts
 - c. Myth #3: Declining rates of return on pay-as-you-go systems reflect fundamental problems
 - d. Myth #4: Investment of public trust funds in equities has no macroeconomic effects
- 2) Microeconomic myths:
 - a. Myth #5: Labour market incentives are better under individual accounts
 - b. Myth #6: Defined benefit plans necessarily provide more of an incentive to retire early
 - c. Myth #7: Competition ensures low administrative costs under individual accounts
- 3) Political economy myths:
 - a. Myth #8: Corrupt and inefficient governments provide a rationale for individual accounts
 - b. Myth #9: Bailout politics are worse under public defined benefit plans
 - c. Myth #10: Investment of public trust funds is always squandered and mismanaged.

The authors claimed to prove, that many of the arguments advanced in favour of individual accounts are not necessarily valid, and that pension policy therefore requires a more nuanced approach than that implied by a single "optimal" constellation of pillars. Orszag and Stiglitz assumed, that in particular, a second pillar that relies exclusively on a privately managed, defined contribution approach may not be appropriate for many countries and the optimal approach is likely to vary across countries, depending on differential attitudes toward risk-sharing, inter-generational and intra-generational redistribution, and other factors (Orszag & Stiglitz , 1999). The authors also proposed more expansive view of the optimal second pillar which should incorporate well-designed public defined benefit plans. A privately managed second pillar is not always optimal. A more expansive perspective would allow policy-makers to weigh appropriately all the tradeoffs they face, including private vs. public systems; prefunding vs. not prefunding; diversifying vs. not diversifying; and defined contribution vs. defined benefit pension plans (Orszag & Stiglitz , 1999).

Since the onset of the global crisis in late 2008, several countries including Latvia have been backtracking on the funding of their private pension systems to help to lower their fiscal deficits. These actions reflect the individual countries' recognition of the large fiscal costs associated with pre-funding of future pension liabilities. Pre-funding costs also make it more difficult for pension reformers to comply with the EU's Stability and Growth Pact (SGP) rules (Velculescu, 2011). A new direction of scientific research appeared, where the impact of crisis is estimated and the reasons of negative trends are specified (Zartaloudis, 2014) (Altiok & Jenkins, 2018) (Altiparmakov, 2018) (Duvvury, et al., 2018) (Komp, 2018) (Börsch-Supan, et al., 2018) (Jakimova, 2018) (Whitehouse, et al., 2009)

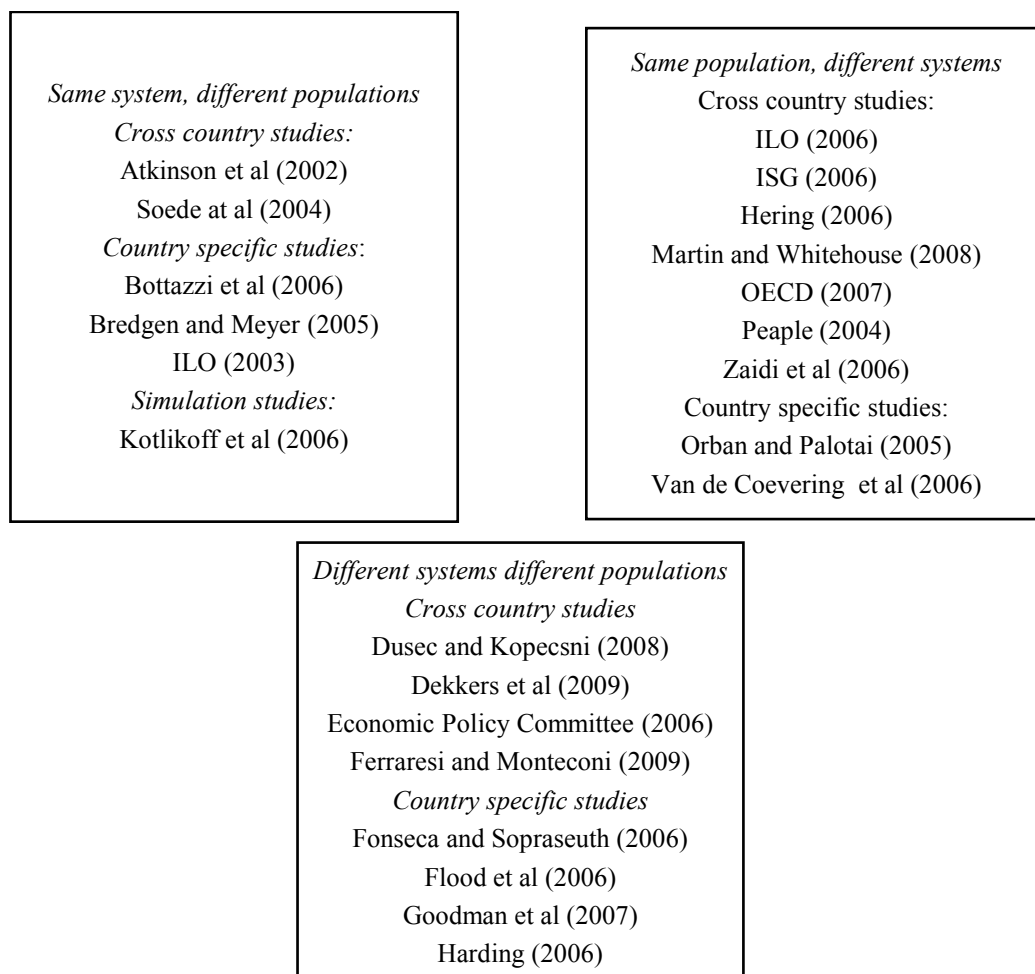
Additional challenges have been detected for developing countries: populations getting "old" (in some cases, rapidly) before they get "rich"; large rural/agriculture populations and large informal-sector workforces; large internal and international migration flows; and weak institutions and information and governance systems (which often have yet to earn the trust of the electorate (Bloom & McKinnon, 2013).

The worldwide reassessment of the policy approach to pension system reform is broadly the result of three changes: a readjustment of objectives (such as a refocus on basic protection for the vulnerable elderly); moving reform needs (such as recognizing the urgency of addressing the effects of population aging and deferred retirement ages) (D'Addio, et al., 2010) (Qi, et al., 2018) (Cottier, 2018) (Atalay & Barrett, 2015) (Hanel & Riphahn, 2012) as well as perceived and actual

changes in enabling environments (such as more realistic views about the capacity of funded schemes to manage risks, the achievable rates of return, and the fiscal restrictions to finance transition deficits) (Holzmann, 2012) (Orenstein, 2013) (Arza, 2008) (Barr & Diamond, 2009) (Castagnolo & Ferro, 2010) (Drahokoupil & Domonkos, 2012) (Cui, et al., 2011) (Arefjevs, 2017).

The reassessment has strengthened the push for alternative or complementary reform approaches, such as Non-financial (or Notional) Defined Contribution (NDC) and Matching Defined Contribution (MDC) schemes (Ponds & Van Riel, 2009) (Vidal-Melia, et al., 2009) (Dundure, 2017). While these new approaches should help to move pension systems towards greater coverage and sustainability, there is a number of issues that still await solutions, such as addressing the uncertainty about longevity increases (Holzmann, 2012).

While there is broad agreement that the influence of ageing on future pension spending is an important constraint, there is increasing interest in assessing pension reforms more broadly, looking at their impact on pension system's abilities to achieve their goals (Grech, 2013) within the frame of financial sustainability. According to Grech, this literature appears to be divided into 3 main strands. The first attempts to evaluate the impact of changes in the pension system on a population with set characteristics, while the second focuses on the impact of the same pension rules but on different population groups. The third approach tries to compare the impact of different pension rules on different population groups. Within these categories, researchers have adopted three different focuses, namely studying reforms in just one country, carrying out cross-country analysis and hypothetical reform simulations (Grech, 2010). Figure 1 groups some of existing studies along these dimensions.



Source: Grech, 2010

Fig.1. A taxonomy of studies on the reforms' effects on pension system outcomes

The results of distinct scientific research become fundamental for modelling the consequences of pension reform. Scientifically described and proved relationship between different social and economic processes sets up an algorithm for microsimulation models, computable equilibrium models and overlapping generation models. This kind of modelling has become popular already at the end of the 20th century, but also nowadays such models are constantly improved and updated.

A profound analysis of pension reforms is a demanding modelling task because it should integrate three types of effects (Galaasen, et al., 2014):

1. First, a large amount of detailed information is required to provide an operational and relevant description of the reform elements, such as e.g. threshold values, coordination with occupational private pension schemes, special arrangements for low-income groups, temporary rules phased out during transition periods and other exceptions from main principles. In addition, the model should capture the heterogeneity of individual earning profiles and other aspects of individual life courses. Such details are not only important for the redistributive properties of the system, but also for accurate computations of the aggregate public pension expenditures. Dynamic Microsimulation (DMS) models provide such details, which make them frequently used by the authorities to compute effects on individual benefits and public pension expenditures (Fredriksen, et al., 2015).
2. Second, realistic estimates should capture that pension reforms indeed intend to affect behaviour, notably labour supply. A tremendous empirical literature has studied how pension schemes affect labour supply, especially through retirement.
3. Third, the mechanical and the behavioural responses to plausible pension reforms are likely to be strong enough to cause significant general equilibrium repercussions in a long run perspective, motivating the use of Computable General Equilibrium (CGE) models pension reform analyses. A good illustration of the potential power of equilibrium effects is Coile and Gruber (2003). Their estimated effects on the budget deficit of the US Social Security reform reflecting just the expansion of tax bases, whereas actuarial mechanisms leave expenditures almost unaffected. In a study of a Norwegian pension reform proposal, also Holmøy and Stensnes (2008) find a stronger fiscal contribution from expansion of tax bases than from lower pension expenditures. Beetsma, Bettendorf and Broer (2003) and Bovenberg and Knaap (2005) use CGE models with overlapping generations (OLG) in the tradition pioneered by Auerbach and Kotlikoff (1987) to assess budget and economic consequences of stylized pension reforms in the Netherlands. Fehr (2009) surveys the use of stochastic CGE models in analyses of population ageing and pension reforms.

The latest trend in estimating pension reforms is an approach, which combines dynamic microsimulation model and computable general equilibrium model (macro modelling) for predicting the effects of pension reform. For example, Fredriksen et. al propose a micro-macro assessment of fiscal effects of Norwegian pension reform (Fredriksen, et al., 2019).

Relatively recent topics in this literature include the transition between steady states, uncertainty and risk sharing, social efficiency effects, as well as inter- and intra-generational income distribution effects. Papers addressing these issues include: (Fehr & Habermann, 2010); (Harenberg & Ludwig, 2015). Fehr and Kindermann (Fehr & Kindermann, 2008) introduce hyperbolic discounting in an analysis of the welfare effects of the German social security system. Optimal retirement in an OLG model is also included in the analyses of stylized pension reforms in (Fehr, et al., 2012) and (Imrohoroglu & Kitao, 2010) as well as in the studies of Spanish pension reform (Díaz-Giménez & Díaz-Saavedra, 2009) and (Sánchez Martín & Sánchez Marcos, 2010). Imrohoroglu and Kitao introduce both optimal retirement and benefit

claiming in a dynamic stochastic OLG-CGE model of the US economy. The same modelling approach is used by Galaasen in a study of the Norwegian pension reform of 2011 (Galaasen, 2017).

Rather broad area of scientific research is dedicated to the universal accession to pension reforms and pension systems in the framework of Open Method of Coordination (OMC) through which the European Union (EU) has extended its role on pensions. OMC has been developed as a process to support and facilitate Member States in meeting the goal on poverty eradication and linked goals in employment and other social areas, such as pensions, health care and making work pay. The process recognizes what has come to be termed the inter-linked and inter-dependent policy triangle of economic, employment and social policies. Economic development is, of course, essential to make progress in the employment and social spheres. However, it is often not sufficiently recognized that economic development is also dependent on both employment and social development. Achieving the employment and social goals of the Lisbon Strategy, while at the same time striving to be the most dynamic and knowledge-based competitive economy in the world is a major challenge. In the framework of OMC Member States share common challenges to a greater or lesser degree in the social area which among different elements also include ageing of the population and poverty and social exclusion. EU countries also share a common goal of maintaining and enhancing the European social model, which involves a major role for the state, in a spirit of solidarity, in providing social protection and promoting greater social cohesion. The overarching objectives of the OMC for pensions are to promote adequate and sustainable pensions by ensuring (European Commission, 2018):

1. adequate retirement incomes for all and access to pensions which allow people to maintain, to a reasonable degree, their living standard after retirement, in the spirit of solidarity and fairness between and within generations;
2. the financial sustainability of public and private pension schemes, bearing in mind pressures on public finances and the ageing of populations, and in the context of the three-pronged strategy for tackling the budgetary implications of ageing, notably by: supporting longer working lives and active ageing; by balancing contributions and benefits in an appropriate and socially fair manner; and by promoting the affordability and the security of funded and private schemes;
3. that pension systems are transparent, well adapted to the needs and aspirations of women and men and the requirements of modern societies, demographic ageing and structural change; that people receive the information they need to plan their retirement and that reforms are conducted on the basis of the broadest possible consensus.

One of the leading authors in the field of OMC is David Natali. The author identifies the main socio-economic, institutional and political factors, that led to the launch of the new method, and tries to explain the peculiar ‘weakness’ of the coordination process of national pension reforms (in terms of its convergence capacity) (Natali, 2011).

Other studies investigate whether European pension systems have become more similar and convergent in terms of the three main objectives of the OMC: adequacy, sustainability, and modernization of pensions (Chybalski & Gumola, 2018) (Tinios, 2012) (Natali, 2008) (Greve, 2018) (Kennett & Lendvai-Bainton, 2017).

Adequacy of pensions is one of the latest trends of scientific research. As it has been mentioned previously, different aspects of sustainability are the main questions policy makers and scientists are worried about. But in some cases sustainability is achieved via the amount of retirement benefits and such scenario is not acceptable anymore as far as sustainability becomes jeopardized by political and social risks. In other words, society starts to disrupt the implementation of reform.

There does not seem to be a broad consensus in policymaking circles and academic literature on what constitutes the best measure of pension adequacy. While various indicators have been developed and used, no single measure appears to offer a clear indication of the extent to which reforms will impact on the achievement of pension system goals. That is

why some studies pretend to define the term of adequacy or assess only a limited range of adequacy indicators (Rajevska, 2016) (European Commission & Committee, 2018) (Saunders & Wong, 2011) (Chybalski & Marcinkiewicz, 2016). Another direction of research tries to formulate the systemic approach to measuring pension adequacy (Grech, 2013) (Alonso-Garcia, et al., 2018) (Alonso-Fernandez, et al., 2018) and its contribution to the efficiency of pension system in general (Chybalski, 2016).

Pension reform modelling is very complex. That is why a numerous amount of studies cover this area. Some of them are narrow, another are very broad-based. Usually each study relies on a number of assumptions, which limit the reliability of research and its implementation. Almost all models are relevant for previous periods, but new challenges make them disputable. For improving the quality of scientific research, Barr and Diamond (Barr & Diamond, 2008) propose: the need for a holistic approach, the need to consider the redistributive effects of pensions, and the need to frame analysis in what economists call a second-best context.

- 1) Analysis requires a holistic approach. Pensions have effects on the labour market, economic growth, the distribution of risk, and the distribution of income, including by generation and gender. Analysis needs to consider the pension system as a whole, including its multiple objectives and all parts of the pension system.

It is a mistaken policy, for example, to be obsessed with the need for an actuarial earnings-related pension, given the need for a poverty-relief element elsewhere in the system. What is relevant for analysis is the combined effect of the system as a whole.

- 2) Any pension reform has distributional effects. Suppose policymakers are establishing a brand new pension system. If they introduce a Pay-As-You-Go (PAYG) system, the contributions of today's workers pay for the pensions of today's retirees; thus the first generation of retirees receives a pension. If, instead, policymakers introduce fully funded pensions, the contributions of today's workers go into their pension savings accounts; thus the first generation receives little or no pension. The same argument applies in a country that already has a PAYG system: a move toward funding through higher contributions or lower benefits redistributes from current generations to future ones. Thus any choice about how a pension system is financed is inescapably also a choice about the intergenerational distribution of income.

It is mistaken to ignore the fact that any policy choice between PAYG and funding necessarily makes choices about redistribution across generations and thus mistaken to present the gain to pensioners in later generations as a Pareto improvement³, since it comes at the expense of the first generation.

- 3) Analysis should be framed in a second-best context. What economists call first-best analysis is the world of rational economic man and woman. The assumptions of that model include perfect information, rational behaviour, complete markets (e.g. the ability to buy an indexed annuity that pays out at some future date), and no distortionary taxation. As emerges repeatedly in the next section, the market for pensions is characterised by multiple and serious failures of these assumptions, including the following.
 - a. Imperfect information, addressed by the economics of information (for which the 2001 Nobel prize was awarded);
 - b. Non-rational behaviour, addressed by behavioural economics (for which the 2002 Nobel prize was awarded);
 - c. Incomplete markets and incomplete contracts (for which Peter Diamond's work was cited in the 2010 Nobel Prize);
 - d. Distortionary taxation, which is inherent in any system which includes poverty relief, and hence has to redistribute from richer to poorer people (this topic is addressed by the literature on optimal taxation for which the 1996 Nobel prize was awarded).

These failures are relevant not only to the analysis of pensions but to many other markets (Barr, 2012).

It is mistaken to use first-best analysis in a second-best context. First-best analysis is useful as an analytical benchmark, but is a bad basis for policy design (Barr & Diamond, 2008).

Conclusions

Assessment of pension reforms became relevant in the second half of the 20th century. Taking into consideration modern trends of demographic shift, it is reasonable to assume, that pension reform studies will become more vital in future. Recent studies of pension reforms may be characterised as follows:

1. The studies are very complex. Simple projection of public expenditures has evolved into simulation models. The latest approach to modelling is an attempt to combine micro and macro simulations.
2. Providing system's financial sustainability remains the main issue of scientist, however, recent simulation models take into consideration the impact of much more wider range of different factors, than previously. Researchers investigate the capacity to achieve financial sustainability in the context of traditional aims of pension system such as income redistribution and poverty relief.
3. The problem of poverty relief determines the new direction of research- investigating the adequacy of retirement income. Series of studies propose the range of parameters for estimating the adequacy of pension and consider the definition of the term.
4. New European and international initiatives emerge, new opportunities for improvement constantly create new challenges for researchers. Studies assessing the impact of OMC on the harmonization of European pension systems have been carried out recently. The European Pillar of Social Rights has been jointly signed by the European Parliament, the Council and the Commission on 17 November 2017. This framework is stricter than OMC and it will provide more rigid recommendations for strengthening European pension systems, therefore simulations will become more complex and scientist will have to take into account more extensive range of factors.

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