

# REVIEW OF THE OCCUPATIONAL PENSION SCHEMES AND PRODUCTS

**Jaroslav VOSTATEK**

*University of Finance and Administration, Estonská 500, 101 00 Praha 10, Czechia*

## ABSTRACT

*We compare the concepts and role of occupational pension schemes and products in the pension systems in the latest decades. Under the liberal social philosophy, dominating the Czech pension policy in the nineties, occupational and social insurance schemes ought to be avoided. In high income economies the occupational pension schemes differentiated to reflect various welfare regimes and different pension gaps. The opt-out method of soft compulsion was used by neo-liberal economists and politicians to change the pension pillars and products, some countries were hit by misselling practices. Latest developments utilize the analyses of pension products and markets and the efficiency of occupational schemes' administration to define the future potential of these schemes. New workplace pensions with defined-ambition products are supported by national pension institutions, trying to reduce the overhead costs and increase the pension savings.*

**Keywords:** occupational pensions, welfare regimes, soft compulsion, workplace pensions, pension savings

**JEL codes:** H55, J32, O16

## 1 Introduction

The formation of universal pension schemes is preceded by pensions provided by the employers. Under the 1896 Act on Civil Servant Pensions which remained in force, in principle, until 1948, 10 years of service in our country gave rise to entitlement to a retirement pension amounting to 40% of the final salary, increased by extra 2% for every 2 additional years. Loyalty was a typical prerequisite for public service as well as for the right to benefit from of a follow-up pension. The same still applies today in many western countries. A modern version of a special public service pension scheme exists in Germany for instance; the pension is calculated under the basic formula:

$$1.79375\% * \text{years of service} * \text{final salary} \quad (1)$$

The significant differences compared to the social insurance scheme used today in the private sector include a higher coefficient (1.79375 compared to 1.5) and the application of the final salary which is, as a rule, at the highest level achieved throughout the service career. In addition, public servants do not pay contributions for their pensions. After WWII, there was a certain conversion between these occupational pensions and other pension systems in the relevant countries. However, the advantages consisting in the relatively high levels of public service pensions remained – otherwise these separate schemes would lose their sense of existence for that matter. At present, 13 (of the 25 listed) OECD countries have separate pension schemes for public servants, while 12 countries have an integrated system [13].

A similar path led to the development of occupational pension schemes in the private sector. Also here, the initial efforts aimed at applying the “loyalty” nature of these pensions. After WWII, occupational pension schemes experienced a major boom in a great number of countries

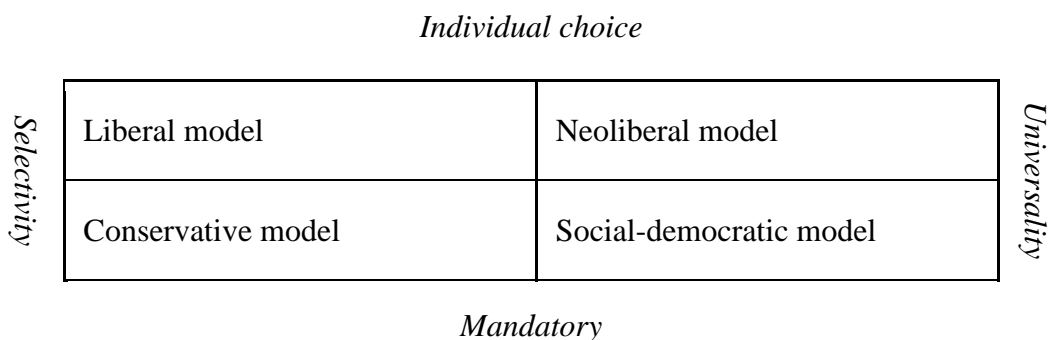
and grew up to nearly nation-wide fully funded systems. Tax deductibility and similar treatments were of major importance for the development of occupational pensions in the different countries. Nowadays, emphasis worldwide is placed on the portability of the pension rights arising in such a manner.

This paper aims at analysing, in particular, the contemporary development trends in the occupational pension schemes in advanced countries, their interconnection with the basic pension social models and, thus, the possibility of using occupational pension schemes in the present Czech conditions.

## 2 Literature Review

A great number of various pension schemes have developed worldwide as a result of the historical development of social policy in the relevant countries. Among those, we may recognize several typical systems which can be considered to apply basic welfare regimes, as defined by Esping-Andersen [3]. Consequently, we can distinguish liberal, conservative and social-democratic social models. We also add the neoliberal model, which has developed since the 1990's, to the range of pension models. Choosing between these social models is a matter of public choice in terms of modern public policy. The fundamental differences in the four aforesaid basic social models and, thus, also pension models can be schematically illustrated on the different emphasis on universality or selectivity, as the case may be, of the pension security scheme, as well as on the individual choice or mandatory nature of this security scheme – see Figure 1.

**Figure 1** Typology of social models



Source: author.

From the historical point of view, occupational schemes were an option under the conservative pension model in the private sector, existing next to the public servant schemes. The formation and development of social insurance systems for mine workers and, in particular, for the blue-collars and white-collars in the private sector gave an essential drive for the further development of conservative systems. Social pension insurance systems concern the relevant social groups in the territory of the entire state, and are significantly state-regulated, from financing and pension structure up to, among other, pension indexation. After the development of social insurance systems in the relevant countries, the occupational pensions were “shifted” to the role of a “second” pillar or, where appropriate, a substitute system – if this system provided a higher level of pensions. In this manner, the “substitute pension institutions” survived in the pre-war Czechoslovakia; similarly, it was possible to avoid the newly established State Earnings-Related Pension System in the United Kingdom at the end of 1970's provided that the employer had an adequate occupational system (“contracting-out”).

The occupational pensions in the role of the second pension pillar represent mostly a bonus in addition to the social insurance scheme – both segmented (conservative model) and universal (social-democratic model). Voluntary occupational pensions may also complement the liberal system (currently in Ireland). The modern-age extreme theoreticians of liberalism fought hard against the employers' engagement in the social area, including occupational pensions; in their opinion, the employers should dedicate themselves fully to generating profit in their businesses. This policy won its way in the UK, for instance, where a “second” contracting-out – from occupational schemes to personal pension schemes, i.e. to a third pension pillar – was promoted under the Thatcher's administration. It resulted in a great shame, as the sales representatives of private financial corporations were often willing – because of their commission – to “advise” their clients to shift to the pension scheme even if it was utterly disadvantageous for them. This mis-selling could easily take place also due to the fact that the occupational pension schemes were, and still are today, strongly differentiated even within the different countries. The Czech liberal Klaus-led government prohibited the formation of occupational pensions in the early 1990's and this prohibition applies until today in fact. In practice, neoliberal economists mostly focus on transforming social insurance systems to mandatory personal pensions, and are not bothered by occupational pensions. Mandatory occupational pensions are, in practice, also often provided by private financial institutions, such as in Switzerland.

An analogical product to the initial fully-funded social pension insurance scheme can be classified as a typical conservative occupational pension system, without the non-insurance components such as the basic pension amount and with the pension being calculated from the final wage, the years of employment with the relevant employer and a coefficient valuing each year of employment. A person becomes entitled to pension after a prescribed minimum number of years in employment. In the initial version, an employee who “prematurely” terminated his/her employment contract lost all pension rights. In the innovated version, pension rights are retained upon a change of jobs, but they cannot be transferred elsewhere and there is also no indexation of the final wage that the employee was earning from the employer whom he left at own initiative or due to own fault. The products of this type are called defined benefit (DB), because here it is defined that the pension is calculated using the indicated pension formula rather than based on the amount of contributions paid. In the DB occupational pension schemes, the employer is liable for the entire scheme – and it is up to the employer to ensure that there are enough funds in the system to pay the pensions. The employer may also agree with the trade unions or the employees that employees will also pay contributions – and the level thereof. The employer's contribution may even be conditional upon a specific amount of contribution paid by the employee.

An extreme example is the Netherlands where more than 90% of employees participate in the occupational pension schemes based on nation-wide collective agreements – for that reason, the system is sometimes referred to as quasi-mandatory. It is a fully-funded scheme, mostly with a relatively high target replacement ratio at 70% of the wage.

A modern modification of occupational pensions consists in the possibility to transfer the funds to another occupational fund or to a personal account held with a private financial institution, such as an insurance company. This does not pose any problem from the actuarial point of view – but also specific parameters are always essential. In this transfer, an employee does not transfer his/her pension rights, but rather certain capital, the so-called “pension pot”. And from this point, there is only a relatively short path to leave the DB system, to divide it into two time-based stages – the first phase is a defined contribution (DC) savings system and the second stage is the pay-out phase, the purchase of a life-long annuity for a lump-sum premium. A transition from DB to DC systems is not only a mere change in the product, but also a significant change in the governance and management system.

Occupational pension schemes of all types contribute to the segmentation of the pension security system, particularly those on a voluntary basis; this path is also commonly followed by the trade unions and their policy. All employers cannot afford to contribute to occupational pensions. At the same time, however, these systems make it possible to adjust the pension scheme to the specific work conditions in the particular sectors or branches. The specifics can also be taken into account where a universal system exists, in the form of a supplement to the system.

The occupational pensions in the different social systems play much differentiated roles. It is no wonder: departmental liberals were refusing occupational pensions as an inefficient paternalism. On contrary, conservatives were altogether satisfied with them, thanks to the emphasis on “performance” or, in practice, rather on social stratification. The communists abolished the occupational pensions because of being in contradiction with the central planning as well as with the Leninist ideology of state social benefits at the full wage level, to then introduce labour categories as a preference for manual and hazardous work within the otherwise uniform state pension security system. Our liberal Prime Minister Klaus enforced the abolishment of labour categories and, as certain compensation, allowed the employer’s contributions to supplementary pension insurance provided by private companies. The social democratic social model combines two universal pension pillars: uniform social insurance and flat-rate or means-tested pension. In the logic of the matter, the social democratic policy is also supported by the trade unions – and vice versa, which results in the promotion of occupational pensions, in particular through collective agreements of higher and nation-wide type.

The application of various social models resulted in very strong variation of importance of occupational pensions in different countries. In the US, for instance, pensions sponsored by the employers are considered to constitute a third layer in a five-layer pyramid – after the public pension pillar and property housing, followed by individual retirement accounts (including transfers from occupational pensions) and other assets. Although the importance of each layer differs depending on the income quintiles of the households, altogether they allowed the last generations of pensioners to retain, on average, their existing living standard in retirement [6].

### **3 Administration and Costs**

In their initial and basic form, occupational pensions are managed by foundations or trust funds in the interest of the employees. Here the employers are in the position of sponsors responsible for the financing of the scheme. This does not exclude contributions from the employees; such contributions may even be a pre-condition for the contributions provided by the employer, with auto-enrolment being used as well, etc. In addition, the specific terms and conditions for the entitlement to a pension are nowadays also primarily a matter of mutual agreement between social partners. There is no possibility of choice for a product or provider within a single occupational pension system. It is in fact a collective pension insurance scheme managed by a non-profit institution.

Occupational pension schemes can be of a various size and, just for that reason already, outsourcing is often used for asset management as well as for ordinary administration. In this manner, the non-profit institution can be restricted to the “mere” strategic management by the administrative board, which entails not only economies of scale, but also potential conflicts of interest with administrators and investors. The non-profit institutions operate in a more or less perfect market environment and their overhead costs, which are reflected in the level of pensions and other benefits, are very differentiated, in particular depending on the volume of assets under their management.

The conventional model of occupational pension provision does not require any sales force because the participants in the scheme include solely the employees of the relevant undertaking or institution or even the relevant sector or branch. In some advanced countries, this model survived in the competition with other occupational schemes (e.g. in Germany), in other countries it was significantly unified into nation-wide social insurance-like systems (e.g. in Finland), while in Switzerland and Australia, occupational pensions simply became mandatory. When replacing DB systems with DC schemes, most countries experienced a fundamental product change affecting the content and, thus, the administration of occupational pensions.

In DB schemes, the crucial part of the financial risk is borne by the employer, while in DC-type schemes, the employer “only” pays a contribution – and the investment risk is primarily borne by the client. It is then – in a certain way – systemically logical that the client has the possibility to choose a pension fund in which “her/his” pension savings are to be invested: the collective pension scheme is transferred to individual retirement accounts – which may or may not be facilitated by the employers, thus turning into a personal pension savings or insurance scheme, which is a fully different provision model. The basic differences in the bearing of the most risks are shown in Table 1.

**Table 1** Risk Bearing for Different Types of Scheme

<b>Type of Scheme</b>	<b>Working</b>	<b>Retirement</b>
<b>Defined benefit</b>	Employer	Employer
<b>Defined contribution</b>	Member	Insurer

Source: Sutcliffe, Ch. (2010). *Back to the Future: A Long Term Solution to the Occupational Pensions Crisis. Insurance Markets and Companies: Analyses and Actuarial Computations*, vol. 1, p. 20.

The common hypotheses that have been put forth to explain the shift to DC plans include the following [7]:

- the simplicity of DC plan designs
- the reduction in risk to employers when undertaking such a change in plan design
- the opportunity for plan sponsors to reduce their annual contributions
- the rising costs associated with the government's increased regulation of DB plans and
- the superior portability properties of DC plans, which fit today's more mobile and independent workforce.

The neoliberal supporters of privatization are in favour of DC schemes, arguing that the individuals may allocate their pension wealth into financial assets according to their preferences [2]. From purely ideological point of view, this argument is understandable; nevertheless, the vast majority of clients of these schemes is inert and has no interest or real possibility to make use of this option, and even government programmes to raise financial literacy are of no help here. The economic theory indicates that employees are not suitable economic entities (agents) to bear investment and annuity risks [11].

The objective advantage of the transition of occupational pension schemes from DB to DC type consists in the introduction of easy portability of savings from one fund (employer) to another; the need for this portability arises even just from the modern labour market itself. It is not possible to build major pension systems on the hypothesis that an employee will work for a single employer throughout her/his life or, more specifically, that it is at least impractical to acquire pension rights from several employers and have, in her/his old age, the “partial” retirement pensions paid from all or most of the employers, and all this regardless of the fact

that every occupational pension scheme also has its “technical minimum requirements” for becoming entitled to a pension which means that, in some cases, entitlement to a partial pension may not always arise.

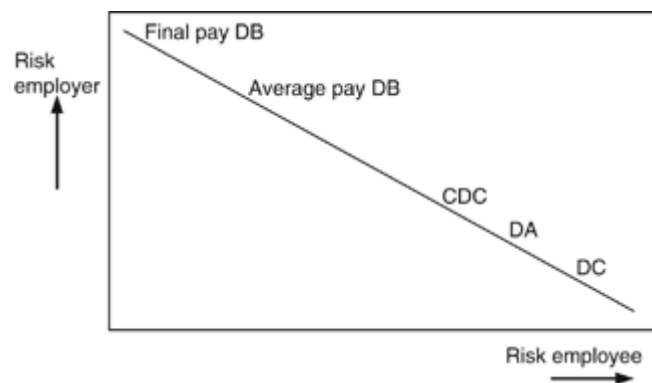
Historically, occupational pensions are “associated” with pension pay-out; the transition to a DC system provides conditions for not using the annuities as a part of the pension scheme. This is usually also the case in practice, unless provided otherwise – in exceptional cases – by state regulations or by agreement between employers’ associations and trade unions. An exception of this type is the Netherlands where the DB type occupational pensions continue to prevail (used by ca. 90% of participants) and where a life-long annuity must be paid to DC type scheme participants as well. Switzerland is another exception – there the annuitization is not mandatory but, on the other hand, the conversion rate of the pension pots to annuities is regulated by the state. Since 2014 the minimum conversion rate of 6.8% in the mandatory occupational insurance scheme applies to clients at 65 years of age. In the optional occupational insurance scheme, this regulation does not apply and the conversion rates are significantly lower!

#### **4 Results and Discussion**

The quasi-mandatory Dutch model of occupational pensions raises interest of theoreticians and politicians in a number of other countries, also due to the fact that the local DB systems of these pensions have been in a modification process since the beginning of this century; these transformations were accelerated after the decrease of investment yields around the world, which resulted and continue to result in a pressure to increase the occupational pension contribution rates, while this pressure has already become unbearable for the business sphere. The main modification of the DB system was the setting of ceilings for the existing contribution rates (in 2012, the average contribution rate was approximately 17.5% of the wage, of which 11.3% was paid by the employer) and the subsequent partial shifting of the investment risk (and the longevity risk) to the employees and pensioners. In 2013, in particular, there was even a decrease in the nominal pensions paid. Many authors are of the opinion that – in this manner – the country actually developed a combined DB + DC system or, in other words, established a stand-alone collective pension scheme [1]. Generally speaking, there may be a range of such combined scheme – depending on whether the product is closer to DB or DC or somewhere “in the middle” between the two, as the case may be. Two options of these combined products are illustrated in Figure 2: one product is referred to as CDC (collective DC), the other as DA (defined ambition). The DB product is present in two versions here: the historically first product derives the pension from the final salary, while the later DB product calculates the pension from the average life-long (valorised) salaries.

In Great Britain, the occupational pension scheme was and is significantly different from the Dutch system. Less than 50% of employees were participating in this pension pillar in Great Britain in 2013. DB systems continue to prevail, as the DC-type occupational systems have not developed much (8-9% of employees). The contribution rates in the DB and DC systems were and still are diametrically different: in DB systems, the average contribution earlier was 14% of the wage (of which 4% were paid by the employee), while in 2013 the average contribution was as high as 20% (with 5% of the wage paid by the employee). On contrary, the average contribution in DC systems earlier was 7% (of which less than 3% paid by the employee) and less than 10% of the wage (of which 3% paid by the employee) in 2013 [12]. The new UK Pension Schemes Act (2015) focuses on scheme classification, introduces the concepts of DB, DC and shared risk pensions, which is the legislative term for the DB and DC combinations. An essential reform consists in the transition to a workplace pension system, which is to be completed in 2016.

**Figure 2** Risk profile of pension systems



Source: Schouten, E. – Robinson, T. (2012). Defined ambition pensions – Have the Dutch found the golden mean for retirement savings? *Pensions*, vol. 17, p. 337.

In Great Britain, the administration decided to implement a number of major reforming changes in order to increase transparency, reduce administrative and other costs, etc.; the occupational pensions are under transformation to workplace pensions – with auto-enrolment of employees. The reason behind this is the high expenses of private pension savings providers. The basic services should newly be provided by the employer, including the use of a default fund and the possibility to use NEST, a low-cost national pension company (competing with both the private companies and the employer funds). The products should be simple; the system is restricted to “pension” savings (NEST will not provide annuities). Workplace pensions are a solution for the problems in the occupational pension provision on the basis of soft compulsion, in reality it is in fact a different model of these pensions.

The developments of occupational pensions in the Netherlands and in Great Britain, for example, imply that the choice of product/system in this pension pillar is of a major importance. The transition from DB to DC entails not only “unburdening” the employers from full financial liability for “their” systems, but also an essential trend to reduce the pension system to a savings system only. In addition, a large number of comparisons showed that DC systems provided by the private sector are significantly more costly and less profitable for the clients – under otherwise the same, comparable circumstances. Bovenberg and Nijman [1], also referring to many other authors, indicate that the costs of the individual defined contribution systems are 50-100 p.p. higher than the costs of occupational pension funds. Pitt-Watson [9] documents that, in the past 57 years, collective pensions in Great Britain would have generated 33% better results than the individual pensions and would have also been more predictable. This conclusion is also reproduced in a research paper of the British House of Commons [12].

As from the new fiscal year of 2015, Great Britain abolished the mandatory annuitization of a substantial part of pension pots in DC pension schemes under the slogan “Freedom and choice in pensions”. The official explanation of the competent Secretary was that “as nature of retirement changes, annuities are no longer the right product for everyone”. Another essential reason was that “the annuities market is currently not working in the best interests of all consumers. It is neither competitive nor innovative and some consumers are getting a poor deal” [4]. Following public consultations, the explanation was modified as follows: “Annuities will remain the right product for some, but I believe that people should be free to make their own choice about how to use their savings. I have been encouraged by the way in which the pensions and investment industry is creating innovative new products designed around the needs and preferences of consumers, and that will better suit the changing nature of retirement” [5].

In the US, there was a strong trend of transforming occupational pensions to DC plans, with a one-off disbursement of pension savings (upon reaching the “retirement age”, here usually 59.5

years). In the middle of 2011, DC-type occupational funds and DB-type occupational funds held USD 7.9 trillion and USD 2.5 trillion of assets, respectively; the assets of citizens held at the individual retirement accounts were estimated at USD 4.9 trillion at the same period. The level of annuitization in DC-type funds (incl. IRA) is negligible. Employers are not interested in annuitization; for them, it is only a complication resulting in higher costs [8].

Following the major change in the concept of voluntary occupational pensions in some countries where the employers were degraded to payers of contributions in favour of pension accounts of their employees, the main purpose and the reason for existence of the occupational pensions should be redefined. Personal pensions can fully assume their role, at least from the technical and legal perspectives. There is only a single possible reason left for the existence of occupational schemes, namely the economic reason: the potential advantage of occupational pensions compared to personal pensions consists in their costs – under otherwise identical conditions, occupational pensions entail significantly lower overhead costs because there are no sales and similar costs and no profit margin. In addition to the adequate governance, the relevant pension funds must be aggregated at a sectoral or nation-wide level in order to be able to realize these potential advantages of the occupational schemes, such as based on the Dutch or Swedish models. If this is implemented, the resulting system will already be closer to or essentially equal to a segmented social pension insurance scheme.

In our country, the occupational pension system was rejected by the Klaus government in the beginning of 1990's for ideological reasons as well as because of the concerns at that time related to the siphoning-off of funds in the situation of insufficient infrastructure for state regulation of financial institutions. The later right-wing governments consistently continued in the rigorous rejection of occupational pensions – to such an extent that they went into a conflict with the European Union which promoted a single EU market in the segment of (fully funded) occupational pensions in order to decrease the costs of these systems, through the so-called EU Pensions Directive (Directive 2003/41/EC on the activities and supervision of institutions for occupational retirement provision /IORPs/). Essentially, the Czech government won this conflict although, finally, the Directive was transposed by the Act (amendment in 2011) on activities of “institutions for occupational retirement provision from EU Member States ... in the territory of the Czech Republic” providing, however, that these institutions may not be established in the territory of the Czech Republic (Section 10h of the amendment) and are not entitled to be granted a licence even if they meet the requirements. The VF Corporation UK Pension Plan was granted registration by the state supervision authorities (the Czech National Bank); however, the activities of this institution are not clear.

The EU Pensions Directive aimed at developing a single market in the segment of those pension funds that are run under the standard rules of comparable financial institutions – thus contributing to reduced overhead costs. The purpose of this Directive was to establish pan-European pension funds, such as at the level of large multinational corporations. The resulting effects of the Pensions Directive are negligible, as there were 75 active pan-European funds last year. A revision of this Directive has been ongoing and pending for several years. However, the problem might be of a more fundamental nature than the EU officials have been willing to admit so far.

The occupational pension provision model has been differentiated to a large extent: in some countries, the original system was essentially retained (Germany) while, in other countries, the occupational pensions have become quasi-mandatory on a collective basis (the Netherlands, Sweden, Finland) or mandatory, in one way or another, based on workplace pensions (Australia, Great Britain) and, last but not least, there has been a mix between the occupational and personal pensions with a robust tax support (US).



The differentiation of the occupational pension provision is, in principle, determined by the choice of the social pension model. Collective systems tend to incline to the segmented social insurance and generate significantly higher pensions under otherwise identical circumstances. The more or less neoliberal policy is associated with high margins for the private savings and annuities providers and with the efforts to regulate the products and use the entire occupational pension system to reduce the overhead costs, largely by using the behavioural economics; national pension institutions as providers of low-cost pension savings are also being joined to this system; a successful concept of low-cost private annuities is lacking and the pay-out phase of these pension systems is left out of the sphere of interest of the politicians with liberal orientation, e.g. under the slogan of freedom and choice for the participants in the modified occupational pension systems.

## 5 Conclusions

In the past decades, the world has witnessed major transformations of occupational schemes and products arising from the changes in the labour markets as well as in the financial markets, with a significant link to the development of pension welfare regimes. In several countries, the occupational pensions came very close to the segmented social insurance system. Other countries implemented neoliberal reforms aiming at transforming occupational pensions into mandatory personal pensions; in reality, however, personal pensions entail higher overhead costs that forced the governments to significantly extend the state regulation, including the establishment of a low-cost national pension institution, exit from annuitization of pension savings and the application of auto-enrolment of employees into the system. The EU Pensions Directive, which was expected to enhance competition in the segment of occupational pensions and to reduce the overhead costs of IORPs, continues to be of low importance overall. Occupational pensions have their irreplaceable role in the pension security system of employees in specific sectors and may also play an important role in the pressure to reduce the costs of private pension savings providers. That holds for the Czech Republic as well; the neoliberal pension model is to be abandoned.

## Acknowledgments

This paper was elaborated within the project „*Current trends in the development of financial markets*”, supported by the Institutional grant for long-term strategic development of research organization in 2015.

## References

- [1] Bovenberg, A. L. – Nijman, T. E. (2009). Developments in pension reform: The case of Dutch stand-alone collective pension schemes. *International Tax and Public Finance*, vol. 16, pp. 443-467.
- [2] Cocco, J. F. – Lopes, P. (2011). Defined Benefit or Defined Contribution? A Study of Pension Choices. *Journal of Risk and Insurance*, vol. 78, pp. 931-960. Retrieved from: <http://search.proquest.com/docview/912208036?accountid=37662>
- [3] Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism*. Cambridge: Polity Press & Princeton: Princeton University Press.

- [4] HM Treasury (2014a). *Freedom and choice in pensions*. Retrieved from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/294795/freedom\\_and\\_choice\\_in\\_pensions\\_web\\_210314.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/294795/freedom_and_choice_in_pensions_web_210314.pdf)
- [5] HM Treasury (2014b). *Freedom and Choice in Pensions: Government Response to the Consultation*. Retrieved from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/332714/pensions\\_response\\_online.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332714/pensions_response_online.pdf)
- [6] ICI (2014). *2014 Investment Company Fact Book. A Review of Trends and Activities in the U.S. Investment Company Industry*. 54th ed. Washington: Investment Company Institute. [http://www.ici.org/pdf/2014\\_factbook.pdf](http://www.ici.org/pdf/2014_factbook.pdf)
- [7] MacDonald, B. – Cairns, A. J. G. (2007). The Impact of DC Pension Systems on Population Dynamics. *North American Actuarial Journal*, vol. 11, pp. 931-960. Retrieved from: <http://search.proquest.com/docview/199039318?accountid=37662>
- [8] Orth, B. J. (2006). Managing Longevity Risk in U.S. Retirement Plans through Mandatory Annuitization. *North American Actuarial Journal*, vol. 10, pp. 32-44. Retrieved from: <http://search.proquest.com/docview/199048154?accountid=37662>
- [9] Pitt-Watson, D. (2013). *Collective Pensions in the UK II. Now is the time to act*. London: RSA (Royal Society for the Encouragement of Arts, Manufactures and Commerce). Action and Research Centre. Retrieved from: <http://www.employeebenefits.co.uk/Journals/2013/11/06/p/h/e/RSA-CollectivePensionsintheUKII-2013.pdf>
- [10] Schouten, E. – Robinson, T. (2012). Defined ambition pensions – Have the Dutch found the golden mean for retirement savings? *Pensions*, vol. 17, pp. 334-341. Retrieved from: <http://www.palgrave-journals.com/pm/journal/v17/n4/pdf/pm201237a.pdf>
- [11] Sutcliffe, Ch. (2010). Back to the Future: A Long Term Solution to the Occupational Pensions Crisis. *Insurance Markets and Companies: Analyses and Actuarial Computations*, vol. 1, pp. 11-29. Retrieved from: [http://businessperspectives.org/journals\\_free/imc/2010/IMC\\_2010\\_2\\_Sutcliffe.pdf](http://businessperspectives.org/journals_free/imc/2010/IMC_2010_2_Sutcliffe.pdf)
- [12] Thurley, D. – McInnes, R. (2014). Pension Schemes Bill. Bill No 12 of 2014/15. *Research Paper*, vol. 14, no. 14, pp. 1-74. London: House of Commons. Library. Retrieved from: [https://www.google.cz/?gfe\\_rd=cr&ei=sS6\\_VZTxCcWToQfT6oi4Bw&gws\\_rd=ssl#q=On+the+best+like-for-like+comparison%2C+a+collective+pension+would+on+average+have+outperformed+an+individual+pension+by+33%25+](https://www.google.cz/?gfe_rd=cr&ei=sS6_VZTxCcWToQfT6oi4Bw&gws_rd=ssl#q=On+the+best+like-for-like+comparison%2C+a+collective+pension+would+on+average+have+outperformed+an+individual+pension+by+33%25+)
- [13] Whitehouse, E. (2014). Civil service pension schemes. Options for reform. Presentation. Washington: *World Bank Core Course on Pensions*. Retrieved from: [http://www.worldbank.org/content/dam/Worldbank/Event/pensions/3.%20Whitehouse\\_Civil%20servants%20DC%202014.pdf](http://www.worldbank.org/content/dam/Worldbank/Event/pensions/3.%20Whitehouse_Civil%20servants%20DC%202014.pdf)