IMPACT OF INTEGRATED SUPERVISION ON VOLUNTARY PENSION INSURANCE EFFICIENCY

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ABSTRACT

Adequate supervision (control) of the functioning of voluntary pension insurance is one of the preconditions for the development of this form of insurance. The primary objective of supervision is to protect insured persons and insurance beneficiaries by providing conditions for unhindered and solvent operation of voluntary pension fund management companies. There are three models of supervision in the theory and practice of voluntary pension insurance: integrated, partially integrated, and specialized models of supervision. This paper analyzes the integrated model of supervision, which implies the existence of an institution in charge of the supervision of the functioning of the whole financial sector, including the sectors of banking, insurance, voluntary pension insurance, etc. Some of the variables specific to countries with integrated supervision are presented statistically. The system of voluntary pension insurance in Serbia is still in an early stage, with the integrated model of supervision, implemented by the National Bank of Serbia (NBS).

Key words: voluntary pension insurance, pension funds, integrated supervision model, supervision stages.

JEL: G22, C20

1. INTRODUCTION

The primary goal of a well-defined system of voluntary pension insurance supervision is to increase the amount of pension benefits for the participants. Through this insurance system, people secure financial assets necessary for sustaining living process in the periods when their earning power is low (at an older age). The system of voluntary pension insurance should accumulate a high amount of financial assets that would increase the level of national saving, create opportunities for greater investment activity and, indirectly, for creating new jobs, etc., which is important both for insurance beneficiaries and the national economy. Besides improving the living standard of citizens, the financial market development, significant tax relief increase, etc., proper supervision (control) of voluntary pension insurance is one of the factors of this system's development.

Supervision implies monitoring the operation of entities engaged in this pension insurance system with respect to the compliance of their activities with relevant legislation, analysis of actuarial reports, pension insurance asset management control in the sense of the entities' respect for legal limitations related to investment of assets, etc. Generally, there are three models of supervision: specialized, partially integrated, and integrated supervision model. The integrated model of supervision, often also called "consolidated model of supervision" or the model of "mega-supervision" (De Luna & Thomas 2003,

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Demaestri & Ferro 2004) has been widely discussed in the past several decades, more precisely, since the second half of the 1980s, when Norway, Denmark and some other countries intensified the implementation of the integrated supervision model (Madero & Lumpkin 2007). The end of the twentieth and the beginning of the twenty-first centuries saw the publication of a large number of academic works emphasizing the importance of supervision, especially supervision of financial institutions in the sectors of banking, insurance, pension insurance, etc. Dale and Wolfe (1998) presented a generalized discussion about the structure and importance of financial regulation. Supervision of the insurance market functioning was analyzed by Rees, Gravelle and Wambach (1999). Lumpkin (2002) described the supervision of the financial institutions in OECD members. The integrated model of supervision was the subject of works by Demaestri and Sourrouille (2003), De Luna and Thomas (2003), and Demaestri and Guerrero (2004), who focused their analyses on supervision of the functioning of banks and insurance companies. The aim of our paper is to draw attention to the advantages and drawbacks of the integrated model of supervision of the voluntary pension insurance functioning and to present its impact on the efficiency of voluntary pension insurance system on the basis of analysis of this supervision model (using some of the data made public by The International Organization of Pension Supervisors – IOPS, as well as the data on the sector of voluntary pension insurance published by the National Bank of Serbia – NBS).

2. OBJECTIVES, SIGNIFICANCE AND FORMS OF VOLUNTARY PENSION INSURANCE SUPERVISION

Voluntary pension insurance has been increasingly present in developed countries in the past three decades, and its development has also started in less developed countries. A sharp rise in the participation of voluntary pension insurance in Latin American countries in the 1980s and in East European countries in the 1990s represented an attempt to find an alternative, or at least a supplement, to economically unsustainable systems of public pension insurance. The role of supervision of this segment of pension insurance functioning is very important for defining the conditions, rules and standards for the operation of voluntary pension insurance system. The importance of supervision of voluntary pension insurance comes from the huge importance of this segment of insurance for the society as a whole (Rakonjac-Antić 2010).

The goal of legislation related to pension fund asset investment is to protect savings from a possible abuse and to encourage their rise. Voluntary pension insurance assets are considered to be of exceptional "quality," owing to their characteristics: their large volume and potential for long-term investment. We can, therefore, say that pension funds are among the most important institutional investors in the financial market, mobilizing savings for a long time, boosting investment growth, and impacting a country's economic growth and development. With their massive purchases and sales, voluntary pension fund management companies may even crucially impact price trends in the financial market as a whole. As it has already been stated, unhindered functioning of the voluntary pension insurance market is achieved through efficient and comprehensive supervision. On the one hand, it creates the infrastructure for stable functioning of this form of pension insurance, and, on the other, it enables voluntary pension fund management companies to fulfill their obligations to pension insurance beneficiaries as they fall due (Rakonjac-Antić & Rajić 2010).

The objectives of voluntary pension insurance supervision are manifold. There are general and specific, as well as primary and secondary objectives of supervision. The first among

them is to secure the solvency of voluntary pension fund management companies by setting the minimum pecuniary portion of share capital as well as the form and amount of investment of contributions (premiums) in order to protect the interests of insurance beneficiaries. The creation of conditions for an equal treatment of contracting parties, respect for business rules both by entities engaged in this form of insurance and by insured persons and insurance beneficiaries, stimulation of market conduct, efficient allocation of assets, etc., are also important objectives of voluntary pension insurance supervision. The objectives of supervision are most efficiently realized if the supervision function is institutionalized in the form of, e.g. a supervisory agency or another such entity. Good-quality supervision of voluntary pension insurance implies employing highly professional and efficient staff, independence and responsibility in performing, existence of a stable macro-economic environment, clear-cut legal framework for this form of insurance, respect for market discipline and accounting and financial standards of operation by entities engaged in voluntary pension insurance, transparency of operations, comprehensiveness, etc.

The theory and practice of voluntary pension insurance supervision include:

1. the so-called "traditional" approach to supervision based on the control of the legality of the system functioning and implemented after the completion of activities undertaken by voluntary pension fund management companies (it is also called "ex-post" or "reactive" control); and

2. the so-called "new" risk based supervision approach ("IOPS Annual Report" 2010), which involves risk exposure assessments and defines insurer's risk management process (measures are taken before negative effect occurrence – the so-called "ex-ante" or "pro-active" control). Application of both of these approaches generates the best results in the area of voluntary pension insurance supervision.

There are also the so-called "direct" or "on-site" control, which is implemented periodically, and "indirect" or "off-site" control, which is continuous. Important guidelines for private pension fund supervision are most commonly defined by international organizations engaged in this field. One of the most prominent organizations of this kind is The International Organization of Pension Supervisors (IOPS). It is an independent organization, with around 60 members, dealing with the issues of private pension fund supervision. The members of this international organization are countries with different supervision models (integrated, partially integrated, specialized) and at different stages of supervision implementation and economic development (Ashcroft and Stewart 2010). The primary goals of IOPS are: setting standards in the area of private pension insurance, promoting international cooperation between participants in the private pension insurance system, improving exchange of information, etc. ("IOPS – Pension Supervision in Focus" 2008).

3. SUPERVISION MODELS OF VOLUNTARY PENSION INSURANCE FUNCTIONING

In practice, there are three models of supervision of pension insurance functioning (Madero & Lumpkin 2007):

1. *Specialized model of supervision (S)*, which involves separate supervision by, e.g. an agency, only of the functioning of voluntary pension insurance. This model of supervision provides an adequate specialization of the entity implementing supervision, good insight into different risk profiles, while the management of the supervision system passes through a fewer number of stages. This model of supervision is used in Chile, Hong Kong, India, Kenya, Mexico, etc.

2. *Partially integrated model of supervision (P)*, which involves the existence of one agency conducting supervision of the functioning of all forms of insurance, including pension insurance. Insight into the whole insurance market, including voluntary pension insurance, enables a thorough analysis of all the complex elements that allow a better application of the rules which will make this insurance system better and more efficient. This model of supervision of private pension insurance functioning is applied in Finland, Poland, Spain, Thailand, Turkey, etc.

3. *Integrated model of supervision (I)*, which implies the existence of one institution that conducts supervision of the functioning of the whole financial sector, including the sectors of banking, insurance, voluntary pension insurance, etc. This consolidated model of supervision has been adopted by Australia, Austria, Belgium, Bulgaria, the Czech Republic, Germany, Israel, Jamaica, Korea, Luxembourg, Serbia (see Table 6.1), etc.

4. POTENTIALS AND LIMITATIONS OF THE INTEGRATED SUPERVISION MODEL APPLICATION

The main reasons why the integrated model of supervision is so widespread are: more intensive integration of financial services (creation of financial conglomerates), finding options for the application of more cost-effective supervision, making use of the economy of scale, strengthening the confidence of financial services customers through a synergetic effect of consolidated supervision, etc.

Financial services integration exists if certain financial intermediaries (commercial banks, insurance companies, etc.), which are traditionally linked to certain forms of financial services, begin to provide financial services that are typical of other intermediaries. The factors on the demand side are changes in the behavior of financial services customers, rational expectations on the basis of better information, as well as the crisis affecting state pension funds. On the supply side, there are new financial intermediaries that, in rather saturated markets, look for the ways to become competitive by adopting the process of financial services integration. Liberalization also contributes to this process, because countries keep opening their markets to foreign companies that provide financial services and thus financial services integration and financial market globalization are promoted.

Centralized supervision of a large number of financial institutions (banks, insurance funds, voluntary pension funds management companies, etc.) requires fast and comprehensive exchange of information, coordination and cooperation between entities supervising the operation of certain financial institutions attempting to manage risks on the level of a financial group as a whole in the most efficient way (Madero and Lumpkin 2007). Procedures can be harmonized, e.g. for issuing operating licenses (if the relevant prerequisites are met), the differences arising from a large number of regulatory issues may also be reduced and possible arbitration between regulatory bodies be avoided. If the organization of supervision is done well, if the information system is centralized, and if operation costs are reduced to a reasonable level, if the staff are educated for the purpose of acquiring multidisciplinary knowledge, etc., satisfactory effects of supervision can be produced through a good insight into and coordination of the operation of all financial institutions subject to supervision. Nevertheless, the similarities and, especially, the differences between financial services and financial subsystems must be taken into account. However, if the advantages of integrated supervision are not fully utilized, it is very likely that bad aspects will overcome, i.e. the following hazards may appear: the central supervisory body, if there is insufficient

communication with the sub-sector supervision, will not be able to adequately perceive the problems arising in the field; if the entire financial sector is viewed as a sector facing unique risks, there will be no proper risk management in all individual segments and risks will be averaged; poor prevention of systemic risks, "mega-supervisors" may behave like bureaucrats during procedures and be slow to respond to problems, etc.

5. INTEGRATED SUPERVISION AS A FACTOR OF VOLUNTARY PENSION INSURANCE DEVELOPMENT

As stated before, voluntary pension insurance is a form of saving and provides security for the beneficiaries in the years following their retirement. It is a form of pension insurance that has its own idiosyncrasies. Premiums (contributions) are paid continuously (monthly, quarterly, six-monthly, etc.), and, after 15, 20, or 30 years, the payment of pension benefits (pensions) begins. Pension benefits (pensions) may be paid as annuities, at a flat rate, or as a combination of the two. In order for voluntary pension insurance based on individual pension accounts to function, a well developed financial market is required. As this is a matter of long-term investment of assets, there is an investment risk. Basically, a pension depends on the amount of paid premiums (contributions) and the return on the invested contributions. The preservation of the saving component is one of the core problems of the private pension insurance system. Systemic risks have a strong impact on the regularity of premium (contribution) payment by members and on the decrease in the value of a pension fund. There are also employer sponsored voluntary pension insurance plans, which involve complex aspects of agreement between employers, employees and voluntary pension fund management companies. Some of the employer-sponsored voluntary pension insurance plans allow the possibility of employees' borrowing funds from their own pension accounts (in order to make a deposit towards buying an apartment, or to pay for their children's education, etc.) provided they pay the borrowed funds back with interest into their own pension account (Rakonjac-Antić 2010). Tax relief is one of the factors stimulating the development of this form of insurance and decision makers place special attention on it. The development of this voluntary form of pension insurance requires a satisfactory standard of living of citizens, and also involves educating citizens about the necessity of having such a form of insurance.

Supervision of the voluntary pension insurance system must be defined and organized in the best possible way, taking into account the said idiosyncrasies of the system functioning, and, in addition to the previously listed factors, it would have to represent one of the important factors of development of this form of pension insurance. Long-term assets, most commonly invested in the financial market, represent an important component of the banking sector (in the case of saving), life insurance and voluntary pension insurance sectors.

Integrated supervision facilitates the control of investments of the said financial institutions and also makes it possible to come up with more precise recommendations for its improvement. Decisions concerning any limitations on risky investments can be made more realistically, which leads to increased security of the overall voluntary pension insurance system and can also arouse greater interest of potential participants. This synergetic effect is also reflected in improved prevention of systemic risks that pose a threat to all financial institutions, especially to the voluntary pension insurance sector. Integrated supervision model has a greater potential for greater overall consistency of supervision, thus strengthening the position of financial entities in the market. If the entity

implementing centralized supervision uses the same information system, accounting operations (for all sub-sectors), etc., it can lower costs substantially, and, if voluntary pension fund management companies cover some of the supervision costs, money will be saved. Employees can also be educated at a lower cost. Prominent among the most stimulating elements are the importance of a supervision framework, provision of guidelines, rules of business conduct, financial relations, monitoring of compliance with legislation, etc., all of which enable voluntary pension fund management companies to operate safely and efficiently. Proper supervision of voluntary pension insurance implies operational independence and highly responsible professional staff, existence of a stable macroeconomic environment, comprehensive analyses, clear-cut legal framework for the system of voluntary pension insurance, market discipline respect and pre-defined standards of operation by entities engaged in voluntary pension insurance, transparency of operation, etc.

6. PARTICIPATION OF SUPERVISION STAGES IN VOLUNTARY PENSION INSURANCE SYSTEMS WITH INTEGRATED SUPERVISION

The basic stages (elements) of supervision of pension insurance functioning are:

1. *Licensing.* Entities wishing to engage in voluntary pension insurance are issued operating licenses (the so-called "registration of entities" or "issuance of operating licenses"), as are individuals wishing to perform important roles in pension insurance. The criteria that must be met by participants in the market of this form of pension insurance are set in advance, whereby the risk of participation of incompetent or unqualified persons is controlled (Hinz and Mataoanu 2005). Most commonly, high amounts of initial capital are required in order to protect the system from negative consequences of risky and negligent conduct of a fund management company. Namely, through the licensing process, entry to voluntary pension insurance market is barred to those persons not meeting professional standards. Among other things, licensing has two positive sides. As previously stated, unprofessional engagement in pension insurance is rendered impossible and there is greater confidence in the proper functioning of the pension insurance system. The systems of voluntary pension insurance supervision differ by the degree of restrictiveness of the licensing stage and by licensing periodicity. The integrated supervision system is supported both by developed and less developed countries, i.e. by both countries with a developed system of voluntary pension insurance and countries which are introducing voluntary pension insurance. Frequently, in the developed countries with the integrated supervision model, the licensing stage is less restrictive than in the less developed countries.

2. *Monitoring*. During the second supervision stage, control and monitoring of data presented as part of financial reports, actuarial analyses, etc., are carried out. The reports and analyses are submitted to monitoring institutions by pension fund management companies. Information is collected in order that a supervisor, within their authority, might monitor the condition and activities of the companies. The information may be presented to a supervisory body daily or periodically. Making the information (reports) public makes the activities of voluntary pension fund management companies more transparent. Some supervision systems make use of reports prepared by auditors, rating agencies, etc. Monitoring varies with respect to the type and volume of information that a supervisor uses. The aim of this kind of monitoring and data control is to eliminate possible irregu-

larities in the operations of the pension insurance system in a timely fashion.

3. *Communication.* The third stage of supervision involves communication between employees of the supervisory sector and pension fund managing entities. Supervisory institutions are engaged in a large number of activities in this third stage of supervision, which can be viewed as complementary to the second stage – monitoring, i.e. keeping track of the flow of information from a company providing voluntary pension insurance to a supervisory body. There are various forms of interaction in the communication stage. This stage of supervision may involve presentation of periodic reports, strategies and activities of fund managers, periodic meetings at which joint activities of importance to all system participants are proposed and analyzed, etc. Communication can also include a permanent flow of information towards pension fund management companies about their rights and obligations, all in order to ensure efficient operation. Supervisors may announce their priorities, development strategies, and they may also grant approval for certain activities of participants in the voluntary pension insurance system. Besides training managers in voluntary pension fund management companies, supervisors may, through publications and websites also educate current and future beneficiaries of voluntary pension insurance on the importance and elements of this form of pension insurance. Publication of information on the voluntary pension insurance system is a form of public relations.

4. *Analysis of data submitted to a supervisory body.* The methodology of the analysis of data received from all pension fund management companies is regulated by legislation. Control of the adequacy of reports submitted by the said companies is carried out to check whether the reports are drawn up in compliance with legislation. During the analysis stage, facts and figures shown in financial, accounting, actuarial, and other reports are compared against defined standards. The activities supervised can be ranked by purpose, intensity, frequency, etc. The proactive system of supervision, for example, implies performing frequent analyses in order to quickly observe any possible deviations from preset boundaries. If analysis establishes there are irregularities, the supervisory body intervenes and implements corrective measures.

5. *Intervention*. In this stage, the supervisory body resorts to intervention, which may be:

- injunctive (pension fund management companies are required to make adjustments immediately, for example, to abandon an activity at the behest of the supervisory body); and

- based on negotiations (pension fund management entities receive certain suggestions and intervention is performed through negotiations in order to find a satisfactory solution or the issue is resolved in court).

6. *Correction.* The last supervision stage involves correction of observed irregularities in the pension insurance functioning. Correction is sometimes rather similar to intervention, because it most commonly follows it. It may, for example, involve punitive measures (fines, etc.), restoration to the original state of affairs, covering direct and indirect costs, or some other measures aimed at ensuring proper functioning of pension insurance. The goal of the said corrective measures is to compensate for damage or reduce it to a minimum. It is often emphasized that an important goal of these measures is education of the companies that have caused irregularities, so that they do not make this type of error again. The implementation of these supervision stages depends on the level of development of a country, its financial market and legal framework, the number of pension funds supervised, business environment, etc. (the analysis was done on the basis of data found on the IOPS website on private pension insu-

rance systems in selected countries and those on Serbia posted on the NBS website). The following table contains information about total investments, contributions, number of insurance beneficiaries and number of pension funds in countries with integrated supervision.

Table 6.1 Total investments, contributions, total number of insurance beneficiaries and pension funds in 2008 or in last year for which data is available, in selected countries with integrated supervision.

Country	Total investments (in local currency million)	Total investments in % of GDP	Total contributions in % of GDP	Total retirement income in % of GDP	Beneficiaries (000)	Total number of pension funds
Australia	1,170,370	94.69	9.74	3.92	32,006	394,217
Austria	12,546	4.45	0.39	0.20	51,453	19
Belgium	11,407	3.31	1.73	2.62	2,786	251
Bulgaria	2,303	3.45	1.10	0.19	3,646	31
Czech Republic	191,715	5.20	0.84	0.33	4,449	10
Germany	117,884	4.72	0.29	0.15	7,575	180
Israel	308,127	43.05	2.07	1.71	3,080	47
Jamaica	196,410	18.00	-	-	60 (in 2006)	530 (in 2006)
Korea	78,508,318	7.67	0.89	0.77	9,442	482 (in 2005)
Luxembourg	390	0.99	0.19	0.05	9	18
Holland	675,839	113.42	4.01	3.65	17,436 (in 2007)	714 (in 2007)
Romania	934	0.18	0.17	-	4,182	23
Serbia	-	-	-	-	168	8
South Africa (2006)	1,012,680	58.03	4.65	5.22	10,002	13,390 (in 2005)

Source: http://www.iopsweb.org, http://www.nbs.co.rs

For example, the most common supervision stage in Australia (39,660 GDP per capita in 2009) is the communication stage, followed by data analysis, intervention, monitoring, licensing, and correction (we observe in Table 6.1 that total contributions in % of GDP amounted to 9.74 in 2008). The supervision system in Austria (40,300 GDP per capita in 2009) is characterized by the fact that attention is mostly placed on monitoring and communication stage while the licensing stage is less prominent (total contributions in % of GDP amounted to 0.39 in 2008). The supervision system in Belgium (37,900 GDP per capita in 2009) pays most attention to monitoring, followed by the less prominent stages of licensing and intervention (total contributions in % of GDP amounted to 1.73 in 2008). The most prominent supervision stage in Romania (9,518 GDP per capita in 2009) is licensing ("IOPS–Pension Supervision in Focus" 2008).

We can conclude from the above that, in the supervision system, more developed countries (those with high GDP per capita), with developed pension insurance systems, place most attention on activities in the stages of communication and monitoring, while in economically less developed countries, which are also those with less developed pension insurance, the first supervision stage, licensing, is the most intensive one.

7. FORMS OF PRIVATE PENSION INSURANCE ASSET INVESTMENT AND INTENSITY OF SUPERVISION

As already stated, the more developed the private pension insurance system in a country, with an organized and efficient financial market, the lower the degree of contribution investment limitations, which also impacts the intensity of supervision. In keeping with the core objective of pension saving, there is always the requirement for the safety of contributions and their investment, which is more prominent than in the case of other financial institutions, because pension-related assets guarantee social security for pension beneficiaries and their family members. Therefore basic principles of investing contributions towards pension insurance liquidity, safety, and profitability must be respected.

Table 7.1 Structure of assets (in % of total investment) in 2008 or in the last year for which data are available, in selected countries with integrated supervision.

Country	Cash and deposits	Bills and bonds in public and private sectors	Stocks	Land and buildings	Other investment
Australia	10.37	-	22.54	4.35	58.48
Austria	15.18	48.99	21.20	2.15	11.13
Belgium	4.37	8.28	6.78	0.93	79.08
Bulgaria	23.88	54.81	10.40	3.60	7.32
The Czech Republic	8.06	78.89	2.99	0.88	9.19
Germany	2.92	26.01	0.04	2.44	39.30
Israel	3.69	84.17	2.95	0.58	7.89
Jamaica	1.80	53.38	10.76	6.69	26.34
Korea	17.90	51.27	2.46	1.00	27.36
Luxembourg	13.50	18.88	0.19	0.00	67.44
Holland	4.77	37.46	37.28	2.66	14.10
Romania	13.13	84.42	1.95	0.00	0.50
Serbia*	30.16	62.60	6.23	0.95	0.06
South Africa (2006)	5.01	8.59	23.32	0.49	62.48

*NBS Third Quarter Report 2010 on the voluntary pension insurance market in Serbia.
Source: http://www.iopsweb.org

In order to preclude possible irregularities, the laws of most countries contain regulations that require that owners of pension accounts be regularly informed by the managers of their assets and great attention is paid to control of the governance of pension funds. Regulation governing investment of pension insurance assets limits the possibilities of making wrong investment moves to the least possible degree. It is forbidden in most countries to invest pension fund assets in the property whose value cannot be determined in an organized market (e.g., shares that are not listed on the stock exchange).

On the basis of data presented in Table 7.1, we can conclude that Australia, Austria, Holland, etc. invest over 20% of the assets in stock and that a large number of countries presented in the table invest over 50% of the assets in bonds (Bulgaria, The Czech Republic, Israel, Jamaica, Korea, Romania, Serbia).

As already stated, in the countries with developed financial markets and developed private pension insurance, stocks have a substantial share in the structure of assets. Data presented in the above tables provide a positive linear correlation between the share of stocks in the structure of pension system assets and total investments in % of GDP. This is indicated by the Pearson correlation coefficient, which is 0.803.

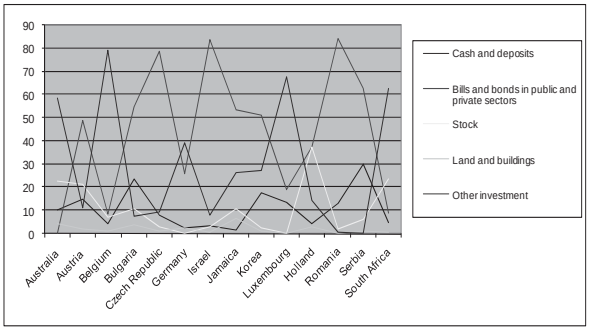

Figure 7.1 Forms of investment of private pension insurance assets

If total investments (in % of GDP) are compared with total pension payments (in % of GDP) in the countries with the integrated supervision model (see Table 6.1), we get the following summary results, presented in the following tables.[1]

Table 7.2: Indicators of linear regression model

Model summary	
R	0.792
R^2	0.697
Adjusted R^2	0.585
Standard Error	1.9414
Observations	11

Note that we have opted for the linear regression model on the basis of the graphical representation of 11 pairs of data in Table 6.1 with the purpose of analyzing the linear correlation between the two variables.

From Table 7.2 we observe that Pearson correlation coefficient is 0.792, which means that there is a positive linear correlation between total investments and total retirement income. The value of the coefficient of determination is 0.697, which means that 69.7% of the variations in the total retirement income are explained by investments. The standard error, as an absolute measure of variation of empirical data from the regression line, is 1.9414.

Table 7.3 Coefficients of the regression line

Coefficients					
	Non-standardized Coefficients		Standardized Coefficients		
	Coefficients	Standard error	*Beta*	*t*	*p* level
Intercept	0.605	0.459		1.320	0.220
Slope	0.036	0.009	0.792	3.886	0.004

*Based on the data shown in Table 7.3, we can conclude that the following equation holds: Retirement income = 0.605 + 0.036*Investments.*

The estimated value of the slope coefficient is 0.036, which is indicative of a positive linear correlation between the total retirement income and total investments. This means that with each unit increase in total investments (in % of GDP) the total retirement income will increase by 0.036% of GDP on average. The estimated value of the constant term is 0.605 and represents the average value of the total retirement income provided that total investments are equal to 0. As total investments are always greater than 0, the interpretation of the intercept on the y-axis has no practical application in this case.

Using a sample regression line, we can test the null hypothesis that the slope of the population regression line is equal to zero, i.e. that there is no linear correlation between the variations of total retirement income and total investments. Based on Table 7.3, we observe that the *p*-value in this test is equal to 0.004. We will therefore reject the null hypothesis for any significance level greater than 0.004. If, for example, we suppose that the significance level is 1%, we conclude that the estimated value of the slope is statistically significant, i.e., that there is a linear correlation between variations of observed phenolmena in the population.

Table 7.4 ANOVA Table

ANOVA

	SS	*df*	*MS*	*F*	*p* level
Regression	21.530	1	21.530	15.098	0.004
Residual	12.834	9	1.426		
Total	34.364	10			

The ANOVA table can be of use to us in testing the null hypothesis that the coefficient of determination for population data is equal to zero, i.e. that the regression is not statistically significant. As this test yields a *p*-value identical to that in the previous case, we conclude that, overall, the regression is statistically significant.

All these results were obtained from the sample of 11 countries on which data were available. We can say that the results we have obtained in this section are valid only if we assume that this is a random sample selected from a population of all the countries with integrated supervision.

8. CHARACTERISTICS OF VOLUNTARY PENSION INSURANCE MARKET AND SUPERVISION IN SERBIA

The supervision of the voluntary pension insurance in Serbia is implemented by the National Bank of Serbia (NBS) through its Sector for the Supervision of Voluntary Pension Fund Management Companies (department for legal affairs, department for direct control and department for indirect control). "Pursuant to the Voluntary Pension Funds and Pension Schemes Act, the National Bank of Serbia has the authority and obligation to regulate through by-laws the following: maximum investment amounts of voluntary pension fund assets; method of calculating fees charged by pension fund management companies; manner of assessing and calculating the market and net value of a voluntary pension fund's assets; return of voluntary pension funds; content and form of financial reports for management companies and funds; frequency, manner and standardized form of reporting by custody banks; manner of conducting supervision of voluntary pension fund management companies; chart of accounts for voluntary pension fund management companies and the chart of accounts for voluntary pension funds; contents of auditor's reports; approximate content and standardized format of a voluntary pension fund's prospectus; procedure for opening and managing accounts of members of a voluntary pension fund; advertising of voluntary pension funds; methodology of harmonizing the operations of an insurance management company with the Voluntary Pension Funds and Pension Schemes Act; types of financial institutions that may act as intermediaries for voluntary pension fund management companies; rules for the identification, measuring and control of risk in the operations of voluntary pension fund management companies. It also has the obligation to keep a register of voluntary pension funds and records of intermediaries and natural persons licensed to engage in dissemination of information (Information Booklet NBS 2011)."

According to NBS First Quarter Report 2011, the voluntary pension insurance market comprised six voluntary pension fund management companies (Delta Generali, Raiffeisen Future, DDOR-Garant, Dunav, Triglav, Societe Generale Penzije). These companies entrusted three banks with custody operations. Net assets of the voluntary pension funds at the end of the first quarter of 2011 were RSD 10.44 bn. In the first quarter of 2011, there were around 169,000 beneficiaries and around 223,000 membership contracts (the number of membership contracts is higher than the number of beneficiaries because some beneficiaries have two or more membership contracts, mostly in different voluntary pension fund management companies).

Around 19% of total contributions accounted for payments by individuals, 30% accounted for payments by employers that made payments on behalf of their employees, whereas around 51% accounted for contribution payments through pension plans (mostly by big companies with large numbers of employees). The preceding information indicates that collective pension insurance is highly represented. Favorable taxing of voluntary pension insurance contributions by all means played a big part here. The maximum tax-free contribution to voluntary pension funds (pursuant to the Amendments to the Citizen's Income Tax Law), as of Feb. 2, 2011, has been increased from RSD 3,894 to RSD 4,343. The employers that make contribution payments on behalf of their employees are exempt from the household income tax and mandatory social insurance contributions up to the amount of RSD 4,343. Also, the payments made by an employer through wage garnishment, deduction and payment from an employee's salary are also exempt from the household income tax. Members of a voluntary pension fund may obtain tax relief based on both of the preceding methods.

At the end of the first quarter of 2011, the structure of the voluntary pension fund assets was as follows: the major portion of them was accounted for government debt securities – 69.4% (the majority of which were T-bills, followed by frozen FX savings bonds and long-term government bonds), demand deposits – 17.5%, shares – 6.3%, term deposits – 4.3%, and property – less than 1%. Compared to the previous years of operation of voluntary pension insurance, it is obvious that the appearance of new financial instruments is significant for this system of pension insurance as it ensures greater investment diversification and creation of conditions for more adequate management of voluntary pension insurance assets.

Based on the above, we can conclude that the voluntary pension insurance market in Serbia is not well developed. In order that the voluntary pension insurance system might continually develop, it is necessary to increase the living standards of citizens and enhance their awareness of the necessity of holding this form of supplementary pension insurance. For several years now, citizens have been sent clear signals about the need to save for a safer future. In the coming period they will have to opt for one of the forms of saving for old age on offer, either through traditional banking services or through life insurance services, voluntary pension insurance services, etc. With detailed explanations of the advantages and drawbacks of all the above forms of saving, the forms of saving through voluntary pension insurance will certainly also be attractive to citizens. However, the following key elements of the system must be insisted on: its transparency and safety. Development of the financial markets (both primary and secondary) is one of the prerequisites for the voluntary pension insurance system development.

The supervision of the operations of banks, insurance companies, leasing companies, and voluntary pension funds and pension fund management companies in Serbia is implemented by the National Bank of Serbia. The supervision of the voluntary pension insurance operations in Serbia is essentially founded on the control of the legality of operations of voluntary pension fund management companies, with gradually introduced supervision based on risk control. This supervision system also requires a change in the organizational and management structure accompanied by permanent education of the staff to be engaged in these activities. In line with an adequate classification of key risks, it is necessary to pay attention to the quantitative and qualitative indicators of the so-called “early warning” that there might be changes in the financial standing of a volun-

tary pension funds management company. So far, analyses of the supervision of voluntary pension insurance functioning have shown that good results are achieved through a combination of traditional and new approaches to supervision.

9. CONCLUSION

The main purpose of supervision of voluntary pension insurance functioning is the protection of beneficiaries of insurance and insured persons by providing a framework for a stable and safe operation of voluntary pension fund management companies. The control of their operations can be direct and indirect. There are three models of supervision: specialized, partially integrated, and integrated. In case of integrated supervision, which is often called "consolidated supervision," an agency, for example, supervises a number of financial institutions (banks, insurance companies, voluntary pension funds management companies, etc.). Provided that supervision is adequately organized, the information system is centralized and operational costs are reduced, good coordination and cooperation are established between the entities implementing supervision of certain financial institutions operations, the staff are educated so that they acquire multidisciplinary knowledge, there is no overlap of activities etc. satisfactory effects of supervision can be produced. Taking into account all the idiosyncrasies of the voluntary pension insurance system, the integrated model of supervision can be one of the stimulating factors of the efficiency and development of this pension insurance system. This influence is especially significant in the segment of preserving the component of saving, on which the amount of the beneficiaries' retirement income also depends. Good supervision of voluntary pension insurance implies highly responsible professionals implementing it, transparency of operation, existence of a stable macroeconomic environment, drawing up of a legal framework for the voluntary pension insurance system, respect for the predefined standards of operation by entities engaging in the field of voluntary pension insurance, etc.

A large number of tasks that entities engaged in supervision must fulfill responsibly is present. The fulfillment of these tasks is often divided into the following stages of supervision: licensing, monitoring (control), analysis, communication, intervention, and correction. The intensity of supervision of voluntary pension insurance functioning is variable and depends on the level of development of the country and the voluntary pension insurance system, legal framework, etc. Voluntary pension insurance in Serbia is still in the initial stage of development and the model of supervision obtaining there is the integrated supervision model, implemented by the National Bank of Serbia. In order to establish comprehensive and efficient supervision, it is necessary to combine supervision based on the control of legality and supervision based on risk assessment.

It would be interesting, in the course of future research, to compare the results achieved in all financial groups (banking, insurance, etc.), especially in the sector of voluntary pension insurance, before and after the application of integrated supervision model, in accordance with the relevant parameters, in three groups of countries: Latin American, East European, and Scandinavian. In the said groups, voluntary pension insurance has a different status from that of public pension insurance, for example. Voluntary pension insurance in Latin American countries is an alternative to the public pension insurance, in East European countries it is supplementary to the public pension insurance, while in Scandinavian countries it is one of the forms contributing to risk dispersion. The results of comparisons of supervision efficiency in the above groups of countries would be significant in the process

of putting forward the proposals for improving the functioning of the integrated supervision model. Another important topic is also systemic risk management aimed at preventing integrated supervision from producing bad results.

REFERENCES

1. Ashcroft, J and Stewart F. (2010) *Managing and supervising risks in defined contribution pension systems*. Working Paper No. 12. International Organisation of Pension Supervisors.

2. Dale, R. and Wolfe S. (1998) The structure of financial regulation. *Journal of Financial Regulation and Compliance* 6(4), pp. 326-350.

3. De Luna-Martínez, J. and Thomas, R. (2003) *International Survey of Integrated Financial Sector Supervision.* World Bank Policy Research Working Paper 3096, Washington.

4. Demaestri, E. and Guerrero, F. (2003) *The Rationale for Integrating Financial Supervision in Latin America and the Caribbean.* Sustainable Development Department Technical Papers Series IFM-135. Inter-American Development Bank. Washington.

5. Demaestri, E. and Sourrouille, D. (2003) *Integrated Financial Regulation and Supervision: Experiences in Selected Countries.* Sustainable Development Department Technical Papers Series IFM-139. Inter-American Development Bank. Washington.

6. Demaestri, E. and Ferro, G. (2004) *Integrated Financial Supervision and Private Pension Funds.* In Supervising Private Pensions: Institutions and Methods, issue no. 6 of the Private Pension Series. OECD. Paris.

7. Hinz, R. and Mataoanu A. (2005) *Pension Supervision: Understanding International Practice and Country context Social Protection Unit*, Social Protection Discussion Paper Series 524. Human Development Network. The World Bank.

8. IOPS (2008) *Pension Supervision in Focus* [Online]. Available from: http//www.iopsweb.org [Accessed 30 April 2011].

9. IOPS (2011) *IOPS annual report* [Online]. Available from: http//www.iopsweb.org [Accessed 30 April 2011].

10. Lumpkin, S. (2002) *Supervision of Financial Services in the OECD Area.* OECD Financial Market Trends 81. Paris.

11. Madero, D. and Lumpkin, S. (2007) *A Review of the Pros and Cons of Integrating Pension Supervision with that of other Financial Activities and Services*. Working Paper No. 1. International Organisation of Pension Supervisors.

12. *NBS (2011) Information Booklet NBS* [Online]. Available from: http//www.nbs.rs [Accessed 30 April 2011].

13. Rees, R., Gravelle H. and Wambach A (1999) Regulation of insurance markets. *The Geneva Papers on Risk and Insurance Theory* 24 (1), pp. 55-68.

14. Rakonjac-Antić, T. (2010) *Pension and Health Insurance.* Publishing Center, Faculty of Economics, Belgrade.

15. Rakonjac-Antić T and Rajić V. (2010) Analysis of pension and disability insurance market in Serbia. *International Symposium organized by the Association of Actuaries of Serbia,* Zlatibor, pp. 255-276.

NOTES

[1] The results were obtained using SPSS statistical software.