"Reserves management of insurers - case of Bosnia and Herzegovina"

AUTHORS	Safet Kozarević Radivoj Kovač

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Safet Kozarević (Bosnia and Herzegovina), Radivoj Kovač (Bosnia and Herzegovina)

Reserves management of insurers – case of Bosnia and Herzegovina

Abstract

The insurers may achieve additional earnings by investing reserves assets, which implies additional stimulation effect for economic growth. The insurers have reserves assets available in several forms and they can use them for various purposes. These assets can be directed to different forms of investments, depending on the development level of the financial market and time periods in which they are available to the insurers. In this paper, the attention will be paid to specificity of reserves management of the insurers taking into consideration their structure and performance of various forms of investments. In this matter, it should not neglect the limitations stipulated by the laws and bylaws, which are describing the limitations in detail for certain forms of investments in respect of level of reserves which insurer needs to have in order not to jeopardize its solvency. Therefore, it is very important to take into consideration the time periods of availability for certain categories of assets, i.e. time periods in which it is expected to have the payments of claims for signed insurance contracts, and insurers have to adjust their policy of reserves investments to these periods. A significant factor for defining the investment policy is also represented by the level of financial market development, i.e. available forms of investments and their specificities. Financial markets of transition countries are characterized by low level of development of financial market in width as well as in depth, and, therefore, insurers have significantly lower number of possible alternatives for investments. That is especially noticeable on the insurance market in Bosnia and Herzegovina which, besides that it has unusual regulatory system, also has undeveloped financial market. For this purpose, the focus of this paper will be on the problem of investing the reserves of insurers on the market of Bosnia and Herzegovina, taking into consideration the present legal regulations from area of insurance.

Keywords: insurance, reserves management, Bosnia and Herzegovina.

Introduction

Financial-accumulation function of the insurer is realized by directing of reserves assets to various forms of investments. The insurers direct the assets held in reserves as guarantee for settlement of liabilities to financial markets considering condition of preservation of their ability to settle future liabilities from insurance contracts and safety of invested assets; this also stimulates the economic growth. Here the insurer faces a conflict, and to manage this conflict effectively the insurer needs to take its decisions based, above all, on principle of safety in order not to jeopardize the settlement of future liabilities on the basis of signed insurance contracts.

1. Structure of insurer's reserves

The structure of reserves in respect of maturity for life insurances is different from reserves for non-life insurances. In other words, in non-life insurances the main part of reserves is committed for short time and with lower accuracy in predicting the payments, while in life insurance the cash flows are more stable. As it may be seen in the liabilities of the Balance sheet of the insurer, one part of reserves consists of technical reserves intended for settlement of liabilities towards insured, and second part represents guarantee (own) fund which the insurer keeps long-term to provide solvency.

1.1. Technical reserves. Primary purpose of technical reserves is settlement of future liabilities

on the basis of signed insurance contracts and coverage of possible losses because of risks coming from insurance operations. Technical reserves need to be sufficient for settlement of reasonably predictable liabilities which will incur in future, and which are coming from insurance contracts.

Technical reserves of the insurer, according to the regulations in Bosnia and Herzegovina, consist of:

♦ mathematical reserve of life insurances;
♦ reserves for unearned premium;
♦ reserves for reported and for incurred but not reported claims;
♦ reserves for bonuses, discounts and return of premium;
♦ reserves for fluctuation of claims; and
♦ other technical reserves.

From investing point of view, the most significant item in liabilities of Balance sheet of the life insurer is *mathematical reserve* which is formed based on interests of premium savings necessary for coverage of future liabilities of the insurer and it represents the part of technical reserves of the insurer. Mathematical reserve is formed for all long-term insurance contracts for persons which accumulate savings assets or assets for coverage of increased risks in late age. Mathematical reserve is, basically, the difference between present value of all future liabilities of the insurer from contracts for life insurance and present value of all future liabilities of policyholders from those contracts.

Mathematical reserve can be calculated using prospective and retrospective methods and both of

them give the same result. The insurers usually use prospective method because in case of increase in mortality rate it doesn't affect adequacy of reserves. In case of decrease in mortality rate the surplus can be added to profit (Andrijasevic, Petranovic, 1999, p. 243). Using the net system of calculation and standard actuarial notation and commutative numbers, for whole life insurance and whole life paying the premiums at the same level, mathematical reserve after t years can be calculated by the following formulas (Kozarevic, 2004, pp. 114-167):

$$_tV(A_x) = A_{x+t} - P(A_x)\cdot \ddot{a}_{x+t} \qquad (1)$$

by prospective method, and

$$_tV(A_x) = \frac{D_x}{D_{x+t}}\left(P(A_x)\cdot_{|t}\ddot{a}_x - _{|t}A_x\right) \qquad (2)$$

by retrospective method. Mathematical reserve for different types of life insurance products can be calculated by the formulas from Table 1.

Table 1. Formulas for calculation of mathematical reserve after t years for different types of life insurance

Type of life insurance	Notation	Mathematical reserve after t years for annual premium paid n years at the same level	
		Prospective method	Retrospective method
Whole life insurance	$_t^nV(A_x)$	$A_{x+t} - _nP(A_x)\cdot_{|n-t}\ddot{a}_{x+t}$ ($t<n$); A_{x+t} ($\geq n$)	$\frac{D_x}{D_{x+t}}\left(_nP(A_x)\cdot_{|t}\ddot{a}_x - _{|t}A_x\right)$ ($t<n$); A_{x+t} ($t\geq n$)
Term insurance	$_tV(_{|n}A_x)$	$_{|n-t}A_{x+t} - _nP(_{|n}A_x)\cdot_{|n-t}\ddot{a}_{x+t}$ ($t<n$); 0 ($t=n$)	$\frac{D_x}{D_{x+t}}\left(_nP(_{|n}A_x)\cdot_{|t}\ddot{a}_x - _{|t}A_x\right)$ ($t<n$); 0 ($t=n$)
Pure endowment insurance	$_tV(_nE_x)$	$_{n-t}E_{x+t} - _nP(_nE_x)\cdot_{|n-t}\ddot{a}_{x+t}$ ($t<n$); 1 ($t=n$)	$\frac{D_x}{D_{x+t}}\left(_nP(_nE_x)\cdot_{|t}\ddot{a}_x\right)$ ($t<n$); 1 ($t=n$)
Endowment insurance	$_tV(A_{x,n})$	$A_{x+t,n-t} - _nP(A_{x,n})\cdot_{|n-t}\ddot{a}_{x+t}$ ($t<n$); 1 ($t=n$)	$\frac{D_x}{D_{x+t}}\left(_nP(A_{x,n})\cdot_{|t}\ddot{a}_x - _{|t}A_x\right)$ ($t<n$); 1 ($t=n$)
Endowment insurance for m years period	$_t^nV(A_{x,m})$	$A_{x+t,m-t} - _nP(A_{x,m})\cdot_{|n-t}\ddot{a}_{x+t}$ ($t<n$); $A_{x+t,m-t}$ ($n\leq t<m$); 1 ($t=m$)	$\frac{D_x}{D_{x+t}}\left(_nP(A_{x,m})\cdot_{|t}\ddot{a}_x - _{|t}A_x\right)$ ($t<n$); $A_{x+t,m-t}$ ($n\leq t<m$); 1 ($t=m$)
Prolonged whole life annuity with n years period of prolongation	$_tV(_{n|}\ddot{a}_x)$	$_{n-t|}\ddot{a}_{x+t} - _nP(_{n|}\ddot{a}_x)\cdot_{|n-t}\ddot{a}_{x+t}$ ($t<n$); $\ddot{a}_{x+t}$ ($t\geq n$)	$\frac{D_x}{D_{x+t}}\cdot_nP(_{n|}\ddot{a}_x)\cdot_{|t}\ddot{a}_x$ ($t<n$); $\ddot{a}_{x+t}$ ($t\geq n$)

For non-life insurance contracts, which are usually signed on period of one year, instead of mathematical reserve there is an unearned premium. Reserves for unearned premium are formed to fulfil future liabilities which will incur after accounting period, and they are available for a short time so that insurers have to take that into consideration when they use them. The unearned premium (UEP) for non-life insurance contract is calculated by formula:

$$UEP = PP\cdot\frac{ND}{TND}, \qquad (3)$$

where PP is policy premium, ND is number of days left till the end of contract and TND is total number of days for contract.

Insurers have to make reservation for payment of claims for insured events which occurred in the accounting period, and until the end of the accounting period there was no payment – *reserves for claims*. Reserves for claims are formed for incurred and reported claims, and for incurred but not reported claims (IBNR) until the end of accounting period for which the reserves are being established. According to the method of establishing the reserve for incurred and not reported claims, these reserves may include:

♦ reserve for incurred and insufficiently reported claims, i.e. reserved claims;
♦ reserve for claims which could be reactivated in future; and
♦ reserve for claims in transfer.

The level of necessary reserves for claims is calculated on the basis of individual evaluation of the claims and Chain Ladder actuarial method (for IBNR). These calculation methods are explained in Booth et al. (1999, pp. 418-452). Mathematical reserve, unearned premium and reserves for claims make the major part of insurer's reserves, so the other technical reserves in the matter of investing can be disregarded.

1.2. Guarantee fund and solvency margin. In order to provide permanent settlement of liabilities, insurers in Bosnia and Herzegovina need to have *guarantee fund* (guarantee reserve), whose most important part is paid capital. Minimal amount of

paid capital which founders have to provide in order to fall into this business activity is stipulated by law for individual types of insurances. Besides initial capital which is formed by payments of founders and on which the dividend is calculated, guarantee fund includes other assets as long-term guarantee for settlement of liabilities out of which the most significant are legal and statutory reserves, and accumulated profit. The insurers provide legal and statutory reserves through distribution of profit, i.e. by allocation of one part of profit to these reserves. The significant characteristic of the guarantee fund is that it is available to the insurer in the long term. Specifically, since the assets for settlement of liabilities on the basis of concluded insurance contracts are provided from technical reserves, guarantee fund is permanently available and it is used for settlement of liabilities from insurance only in case of undesirable deviation of future liabilities. Therefore, insurers can use the assets of guarantee fund for investments in real estate necessary for performing the business activity.

The insurer uses guarantee fund for settlement of liabilities in case of occurrence of external extraordinary circumstances or inadequate pricing. Because of that, *solvency margin* is prescribed as the lowest limit of own capital of the insurer which guarantees that the insurer will settle its liabilities based on concluded insurance contracts even when it is in financial troubles. In addition, in accordance with present legal regulations in Bosnia and Herzegovina, guarantee fund of the insurer can not be lower than the minimal amount stipulated by the law.

2. Investments of the insurer's reserves

With proper reserves management, i.e. by their investing the insurers can achieve additional earnings. For the investments of reserves the insurers have to apply special approach in accordance with defined goals and principles of investments.

2.1. Goals of investments. The selection of type of investment is necessary to be determined with respect to defined goals of investments. Basic goals of investments of reserves for insurers are keeping up the solvency and maintenance of real value of reserves. This implies that the assets are available for settlement of liabilities on time so that the insurer would not be exposed to additional costs of obtaining the assets from special sources due to reduced liquidity. Maintenance of assets in sense of value implies that real value of assets in the moment of settlement of the liability has to be higher or at least equal to the necessary. This means that the yield from investments of assets has to be sufficient to cover the costs of investments as well as the interests included in premiums.

In order to maintain the real value of reserves it is necessary to harmonize the investing for the purpose of reserves. On this way, the assets of guarantee fund are permanently tied and founders expect dividends from their usage. On the other side, the purpose of technical reserves and mathematical reserve is to pay future compensations from contracts, so time periods for their investment have to be harmonized with periods of liabilities maturity.

The level of solvency and liquidity which the insurer has to keep is prescribed by supervisory institutions, and that limits the actions of the insurer in respect of investment of assets. However, limitations prescribed by the supervisory institutions in fact contribute to the fulfillment of asset investment goals. The special goal of investment of assets is maximization of profit, especially with life insurers who distribute significant part of profit from investments to the insureds, for contracts with share in profit. Therefore, it is important to insurers to achieve such level of profit from investments which will satisfy the interests of the insureds and stimulate them to buy the policies. On the other side, while aspiring to maximize profit, basic goals of investments cannot be forgotten, i.e. the solvency and real value of reserves may not be jeopardized.

2.2. Principles of investments. Previously defined goals set the principles to which the insurers comply in their operations, especially in investments of reserves. Most significant principles are safety, liquidity and profitability. In this matter, the significance of certain principles is different in comparison to other business activities. The principle of profitability is counter proportional to principles of safety and liquidity. Taking into consideration the rule that the placements with higher risks have higher return, it results that the higher safety of investment brings lower return and vice versa. In continuum between these two ends, i.e. maximal safety and maximal profitability, the insurer needs to give the priority to safety. However, this does not mean that the optimal investment structure is the one which provides maximal safety. Optimal is the structure of placements which provides maximal return, and at the same time it does not disturb the liquidity and safety of insurer's placements.

3. Reserves management

3.1. The conflict return-risk of investment. Each investment decision is based on the analysis of return and risk. Return and risk are positively correlated, which means that increase in one causes the increase in the other. Since the insurer on its disposal has the assets whose period of availability is different, it has to be very careful in their usage.

Existence of various forms in which the reserves assets may be directed, with different risk and return, puts the insurer to a conflict situation where he wants to manage its own reserves in the best possible way. Different forms of investments, i.e. their various combinations, represent alternatives for resolving the conflicts. Since the insurer resolving the conflicts in reserves management needs to base on safety principle, it needs to put the focus on relation between return and risk for individual forms of investments.

By combining of various forms of investments, the insurer needs to diversify the investments. In order to properly diversify the risk it needs to provide proper measures of return and risk for individual forms of investments. Knowledge about these measures opens the possibility for application of certain models which give the guidelines for diversification of risk, i.e. establishing best combination of various forms of investments, and with that best reserves management.

3.2. Measuring return and investment risk. The insurer is interested in those forms of investments where the return completely covers the risk of investment. The return which completely covers the risk of investment represents *required return* because insurer has to earn it by investing. Required return represents sum of three components: return which could have been earned in conditions of certainty (without risk), expected amount necessary for coverage of inflation effects (according to the expected inflation rate in future) and amount necessary for coverage of risk (Gitman, Joehnk, 1999, pp. 129-137). The sum of first two components represents the risk free return. The return is usually expressed by relative measure, so required return and its components are expressed in the form of rate obtained by taking into account absolute amount of individual component and initial value of investment. The life insurers have to take special care that the *required rate of return has to be higher than the interest rate on which the calculation of premium and mathematical reserves are based.* Also, *achieved rate of return should be equal to or higher than the required,* so, the forms of investments which cannot provide that are not acceptable.

Expected return for period longer than one year can be calculated as:

$$P_o = \sum_{t=1}^{n} \frac{D_t}{(1+r)^t} + \frac{P_n}{(1+r)^n}, \qquad (4)$$

where r is rate of return, P_0 is present value, D_t is expected profit in period t and P_n is expected value at the end of period n.

The risk of investment can be defined as possibility to have the achieved return from investment differing from the expected. The higher this difference is, the higher the risk of investment. As the absolute measure of investment risk the standard deviation is used, which represents square root of mean square deviation of achieved rate of return from the expected, i.e.

$$s = \sqrt{\frac{\sum_{i=1}^{n}(r_i - r)^2}{n-1}}. \qquad (5)$$

Higher standard deviation means higher deviation from expected return rate only if the forms of investments which have the same expected return rate are compared. To compare the forms of investments which have different expected return rate the relative measure of risk is used – coefficient of variation. Coefficient of variation for certain form of investment represents ratio between standard deviation and expected return rate, i.e.

$$CV = \frac{s}{r}. \qquad (6)$$

The investment form which has higher coefficient of variation also has higher investment risk. For calculation of standard deviation and coefficient of variation for certain forms of investments the data on achieved returns in previous years are used. On the basis of those data the expected return rate for previous periods is established. Moreover, there are also some other statistical measures of risk such as covariance and degree of correlation (Mladenović, 2001, p. 666).

3.3. Usage of beta for evaluation of return. The risk of certain form of investment consists of diversified (nonsystematic) and undiversified (systematic or market) risks. Diversified risk can be avoided by diversification, i.e. by combining of various forms of investments. As opposed to diversified, undiversified risk is connected with changes on market as a whole and it cannot be avoided with diversification. So, that is the risk which cannot be reduced by adding greater number of certain forms of investments. Therefore, for the insurer the measure of undiversified or market risk known under the name of *beta coefficient* or short *beta* (β) is very important. Beta shows the sensitivity of return of certain form of investment to changes in average return of that form of investment on the entire market. It represents the ratio of change of additional return from certain form of investment and change of additional return for entire market.

$$\beta = \frac{Cov(r_x, r_y)}{Var(r_x)} = \frac{E[(r_{x_i} - \overline{r}_x)(r_{y_i} - \overline{r}_y)]}{E[r_{x_i} - \overline{r}_x]^2}. \qquad (7)$$

For beta equal to one additional return from certain investment is changed proportionally with additional return for entire market, i.e. form of the investment has the same undiversified risk as the entire market (Van Horne, Wachowicz, 2002, pp. 101-109). Nobel award winner William Sharp developed the model which uses beta for formal connection of risk and return. Capital asset pricing model (CAPM) explains behavior of price of certain form of investment and enables the mechanism which helps the insurer to evaluate influence of observed form of investment on risk and return for entire portfolio.

$$r_i = R_F + [\beta_i \cdot (r_m - R_F)], \qquad (8)$$

where r_i is required rate of return, R_F is risk free rate of return, β_i is beta coefficient and R_m is market rate return. Equation (8) shows that if beta increases then required return for investment also increases.

4. Management of reserves in terms of current legal regulation in Bosnia and Herzegovina

Since there are legal limitations for investment of reserve funds in Bosnia and Herzegovina, then the issue of reserves management comes to the coordination of investments with regulations, because in adoption of laws the biggest attention is paid to investment safety. In such a way, the resolution of the conflicts within the management of reserves is being taken upon legislator who offers the legal solution guaranteeing safety of investments.

Unimproved conditions and undeveloped status of financial market in Bosnia and Herzegovina make difficult the application of previously considered models for measuring risk and returns. Therefore, the problem of management of reserves can be reduced to identification of available funds for investments and forms in which they could be directed. The issue of combination of investment forms is mostly regulated by the legal provisions, so the insurers have no much space for options. Anyway, investments have to be based on the principle of safety in order not to compromise the interests of insureds.

Given the undeveloped status of insurance sector in BH one can conclude that total insurance premium realized by insurers in BH, in comparison with other European countries, is on pretty low level. The similar situation is with the premium per capita and share of premium in GDP, as is presented in Table 2.

Table 2. Basic indicators of insurance sector development in BH

Basic indicators in 2008	EU 27	Croatia	Serbia	Montenegro	BH
Total premium (million EUR)	1.066.731	1.340	589	60	231
Premium life (million EUR)	668.369	352	72	7	33
Total premium/ citizen (EUR)	2.540	302	80	96	60
Premium life/citizen (EUR)	1592	79	10	12	9
Premium non-life/citizen (EUR)	949	223	70	84	52
Premium share in GDP (%)	8,6	2,90	1,9	1,8	1,8

Source: The BH Insurance Agency.

Detailed analysis of financial sector shows that it is, on one hand, quite less developed in relation to environment, while, on the other hand, is highly *bank-centric* and that characteristic has been intensified due to negative impacts on the capital market, so that in 2008 banking sector participated with 80,82% in total assets of financial sector while insurance sector participated with 3,45% only.

Table 3. Structure of the financial services sector in BH (assets in million KM)

Financial institutions	Assets 2007	Equity (%)	Assets 2008	Equity (%)
Banks	19.682	79,91	20.821	80,82
Investment funds	1.764	7,16	1.242	4,82
Insurers	853	3,46	889	3,45
Micro credit organizations	916	3,72	1.210	4,70
Leasing companies	1.417	5,75	1.600	6,21
Total	24.632	100,00	25.762	100,00

Source: The BH Insurance Agency.

Other indicators also show that insurance sector is still in the phase of extensive growth, with the necessity of long-term stabilization of insurers. Only after that, the conditions for intensive growth and development of new products in the sphere of various forms of life, pension and health insurance are to be created. Vigorous step towards organization and development of insurance sector in Bosnia and Herzegovina, in terms of legal preconditions, was made in 2005 by adoption of set of laws in the field of insurance that have led to significant coordination with legal regulation and directives regulating insurance sector in EU. Since the insurance sector in Bosnia and Herzegovina has unusual regulatory system which is conditioned by two-entity organization of the state, the enactment of the laws on the level of both entities has been reached and they stipulate: incorporation and business activities of the entities' regulatory agencies supervising the

insurance, operation of insurers, area of insurance mediations, compulsory types of insurance (especially motor third party liability insurance) and other issues that are important to functioning of this sector. By subsequent continuous adoption of adequate rulebooks, instructions and decisions by entities' insurance supervision agencies (Insurance Supervision Agency of Federation of Bosnia and Herzegovina and Insurance Supervision Agency of Republic of Srpska) the considerable organization and regulation of Insurance sector in Bosnia and Herzegovina has been achieved. In this respect, rulebook, stipulating the amount of required technical reserves, guarantee fund and solvency margin, and investment of insurer's reserve funds, is of particular importance. It is important to mention that although legal regulations between entities have been harmonized, there are still different regulations in some segments on the level of entities that poses the problem in practice, there is no single regulation on the state level and it presents aggravating circumstance for insurers. The State Insurance Agency of Bosnia and Herzegovina is authorized for harmonization of regulations.

Existing legal regulations define a new modality of control and restriction of investment of insurer's reserve funds. In addition, the liability to set solvency margin, guarantee fund and their control has been defined. The solvency margin is determined according to the model of fixed coefficient, which is specific for EU countries. The solvency margin or required guarantee capital is being determined on the premium basis or on the basis of claims (higher amount is taken). Namely, according to Rulebook on elements and control of solvency margin, the solvency margins are calculated separately for operations of non-life and life insurance.

The amount of guarantee fund must not fall bellow stipulated amount for certain types of insurance (which, at the same time, present also the minimum paid capital for certain types of insurance), that is:

- ♦ 5.000.000 KM[1] for insurers performing all types of non-life insurance activities;
- ♦ 3.000.000 KM for insurers performing life insurance activities; and
- ♦ 3.000.000 KM for insurers performing reinsurance activities.

Besides, there are special restrictions defined for insurers performing the "credit insurance".

The law stipulated that supervision agency is authorized to control the investments of funds. In addition, it is defined that any person submitting the claim for payment is privileged in relation to funds which makes the investment of the insurer of relevant type of insurance that the claim refers to. The applicant has a priority in relation to any other creditor in settlement of claim so that any other form of disposal of insurance funds (mortgage, confiscation, etc.) is void.

Rulebook on technical reserve stipulated the methods and models of calculation of technical reserves of insurance, as well as content of the report and method of reporting of supervision agencies. Like in neighboring countries, Croatia, Serbia and Montenegro, as well as in EU countries, the regulations in Bosnia and Herzegovina stipulate the forms in which the investment of funds may be done and also define the restrictions for investment in some forms. In order to regulate the types, methods of investments and characteristics of funds serving for coverage of technical reserves and guarantee fund, evaluation of such funds, restrictions of certain investment, as well as form, content and deadlines of reporting, relevant rulebooks have been adopted (Rulebook on amount of investment of funds in Federation of BH and Rulebook on amount and method of investment of funds for coverage of technical reserves and minimum guarantee fund of insurance companies in Republic of Srpska). For the purpose of better safety of investment it is forbidden to invest in some property (quality restriction of investment), on one side, the amount of investment in usually allowed investment is restricted (quantity restriction of investment), on the other side.

Table 4. Quality and quantity limitations for investment of technical reserves in Federation of Bosnia and Herzegovina

Type of property in which it is allowed to invest technical reserves, including mathematical reserve	Allowed investment	
	Technical reserves	Mathematical reserve
Securities issued or guaranteed by BH, FBH, RS, Brcko District, CB BH, EU member, CB of EU member state	50 %	50 %
Bonds and other dept securities traded on organized market in BH and EU member state	35 %	35 %
Bonds and other dept securities not traded on organized market /seat of issuer in BH	5 %	-
Shares traded on organized market in BH or EU member state	30 %	25 %

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[1] 1 EURO = 1,95583 KM (convertible marks).

Table 4 (cont.). Quality and quantity limitations for investment of technical reserves in Federation of Bosnia and Herzegovina

Type of property in which it is allowed to invest technical reserves, including mathematical reserve	Allowed investment	
	Technical reserves	Mathematical reserve
Shares not traded on organized market / seat of issuer in BH or EU and it operates with profit	5 %	-
Equities in companies with seat in BH, operating with profit	5 %	-
Loans secured by lien on real estate	10 %	-
Loans secured by securities	20 %	-
Loans secured by bank guarantee with seat in BH or EU member state	20%	20 %
Real estate and other rights on real estate	30 %	40 %
Investments in deposits and loans in banks with seat in BH or EU member state	40 %	40 %
Assets on accounts of insurers	without limitation	without limitation
Loans in amount of insurance surrender value based upon life insurance contract	-	30 %

Source: Insurance Supervision Agency of Federation of BH.

Table 5. Quality and quantity limitations for investment of technical reserves in Republic of Srpska

Type of property in which it is allowed to invest technical reserves, including mathematical reserve	Allowed investment	
	Technical reserves	Mathematical reserve
Securities issued by BH, FBH, RS, Brcko District, CB BH, and Funds from Article 8 of the Law on Investment development bank	without limitation	without limitation
Bonds and other dept securities for which the entities from Item 1 have issued a guarantee	without limitation	without limitation
Bonds and other dept securities issued by local self-governance unit in BH	35 %	40 %
Bonds and other dept securities for which the local self-governance unit in BH issued a guarantee	20 %	20 %
Bonds and other dept securities traded on official stock market in BH	20 %	30 %
Bonds and other dept securities traded on free stock market in BH	10 %	10 %
Bonds and other dept securities not traded on organized stock market in BH	5 %	-
Shares traded on official stock market in BH	20 %	15 %
Shares traded on free stock market in BH	10 %	5 %
Shares not traded on organized stock market in BH	5 %	-
Loans secured by liens on real estate	10 %	10 %
Loans secured by securities	10 %	10 %
Loans secured by bank guarantee or loans from the banks with seat in BH		
Real estate and other rights on real estate (construction right, usage right, etc.)	30 %	40 %
Term deposits with banks in BH	40 %	40 %
Equities in investment funds with public offer, with seat in BH	30 %	30 %
Assets on accounts of insurer	3 %	3 %
Loans in amount of insurance surrender value based upon life insurance contract	-	25 %

Source: Republic of Srpska Insurance Agency.

So, the type of property in which technical reserves can be invested is stipulated, that is maximum amount of technical reserves, including mathematical reserve, which can be invested in particular type of property. Also, the certain type of investments is restricted in terms of individual investment in some type of property within such kind due to dispersion of the risk within one type of investment (e.g., in deposits and loans in banks in Federation of BH up to 40% of technical reserves can be invested, but in one bank the most 10% of technical reserves can be invested). Insurers may invest in technical reserves out of Bosnia and Herzegovina, but only in EU member states, with prior approval of supervision agencies but having limitations even for these kinds of investment. In EU member states the most up to stipulated amount can be invested only in securities, bonds and shares.

Insurers in Federation of Bosnia and Herzegovina are obliged to, regardless of the amount of guarantee fund, keep the amount at least 50% of minimum of guarantee fund in free deposit with banks. Other 50% of minimum of guarantee fund can be invested in securities, real estates, deposits and loans respecting stipulated limitation of individual investment in some of allowed forms of the property.

Insurers in Republic of Srpska are obliged to, during the period of working license, keep the amount of at least 50% of minimum guarantee fund for the purpose of time deposit or securities which serve exclusively to protect insurers and maintain solvency and cannot be used for other purposes. There are no limitations for investment of other 50% of minimum guarantee fund.

Forms of investment of insurers' reserves depend on the character of their liabilities. Since reserves in life insurance are stable and long-term, it is natural

for insurers of life insurance to invest primarily either into long-term bonds, or into state owned or corporative ones. In non-life insurance, the basic forms of investment are equity corporative securities, shares and bank deposits. This is preconditioned by the fact that reserves of these insurers are quite unstable and potential claims are large. However, insufficiently regulated the issue of securities in BH and undeveloped capital market create the problem for utilization of insurers' reserves by state. On the other side, by this the use of insurers' reserves for coverage of budget deficit is avoided. Regarding the investment into shares and equities of companies, it is necessary to control for this type of investment in the way which shall prevent the investment of reserves in non-profit companies and companies with shares and equities which can't be converted into the money without discount. Participation of individual investment in the companies' shares and equities should be minimized. As to the investment in real estates, the funds of guarantee capital should be exclusively used. Loans as investment form should be minimized or eliminated completely, and depositing of funds with banks should be done bearing in mind the maturity and should be dispersed with several banks. Investment forms of technical reserves have to be coordinated with dominant business activity and maturity of liabilities. With regard to investment of technical reserves and guarantee fund the attention should be paid to providing the cost-effectiveness that is marketability of deposing and investment, in such a way as to not to disturb safety and their real value. According to up-to-date practice, insurers in Bosnia and Herzegovina in most cases invest in real estates, shares and equities, loans and deposits with banks. Non-transparency of investment does not allow complete defining of actual situation and obtaining of relevant data on total structure of investment.

Conclusion

Given a different origin and maturity of insurer's reserves, as well as different forms of their investment, in order to manage the reserves it is necessary to provide the real measures of the risk and return for various investment forms. Certain models which support the insurers in management could be used on regulated financial markets. Investment of the reserve funds should comply with principles of safety about what the legislators have to take care during the adoption of regulations in the field of insurance. The general feature of the insurance market in Bosnia and Herzegovina is that it is quite undeveloped and still insufficiently regulated one. The new legal regulations have started to give good initial results in terms of better regulation of the insurance one. This can especially be illustrated by establishment of new standards of the capital adequacy, solvency margin, investment of funds, claim settlement and risk management. Process of the market stabilization has already started. Obviously, the process shall not be simple and it shall not be possible to implement it in the short period of time. This is confirmed by experience of other countries that implemented the process of transfer into market model of operation and harmonization of their legislation with EU regulations and directives.

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