

*Piotr Brylikowski**

THE MODEL OF RISK ASSESSMENT IN LIGHT OF SOLVENCY II PROJECT

ABSTRACT. The setting on world market of insurance changes, accounting standards, globalization processes, development of financial instruments, changes of techniques of the risk management as well as change in legislation of the UE caused that the regulations in solvency of insurance companies no longer respond to new challenges which appeared before organs of supervision as far as protection of business subjects and people insured are concerned. Project Solvency II is aimed to create a system of solvency taking into account the profile of risk which insurance companies and reinsurance companies are exposed to on account of their activity. The introduction of new project is connected with necessity of building risk management systems. Such systems have to take into account each essential risk from the point of view of insurance companies. It will turn out to be necessary to build risk assessment models taking into account risks which have not been taken into account when assessing capital requirements for insurance companies so far. The building of model of integrated risk provided in Solvency II Project can turn out to be a considerable challenge.

Key words: Solvency II, Risk, Insurance company, internal model.

I. SOLVENCY II PROJECT – PROFILE

Changes in conception of the supervisions of the insurance market

The conception accepted in the Lisbon Strategy according to which until the end of 2010 in Europe the world most competitive market should be created, therefore many changes also on the financial market are required. The current system of financial supervision was accepted at the same time as the call of the Uniform Insurance Market (the UIM) in 1994 and for many years has not been subject to radical changes. The resolution of the new regulations such as directive on the matter of liquidation of insurance companies, directive concerning

* MSc, Deputy Director of Claims Handling Department, Generali Group Poland, Non-resident Postgraduate Department of Economy, Institute of Econometrics and Statistics, University of Łódź.

additional supervision of the insurers as well as directive concerning groups of insurance companies and directive concerning financial conglomerates supervision, has not influenced the change of form of supervision and it had only a supplementary character.

The principles of financial supervision are home country control regulations (the supervision carried out by the state of seat of institution), the uniform license as well as concentrating of the supervision of the insurer's financial sphere (abandoning a classic materiality form of supervision). The minimum level of harmonization of insurance supervision law translates into positive effect on integration of local markets of the Member States.

The directive changing current financial relations in insurance companies were called Solvency I. Changes introduced within those directives were the supplement to existing supervision system regulations and capital system of the insurers and they were not beyond the existing conception.

The continuation of the initiated reform of Solvency I is Solvency II project which goes considerably further than the current regulations. The main aim of the project is to establish a system of solvency of institutions more effectively accommodated to real risks, with which an insurer has to deal as a part of his activity. It includes not only risks closely related to carrying out insurance activity of an insurer but also risks resulting from functioning of an insurance company. The approach to the matter of solvency of insurance companies has undergone underwent radical change. Apart from quantitative approach to the issue of risk assessment (quantitative determination of risks such as: the minimum guarantee fund, margin of solvency, technical-insurance reserve), Solvency II points to the second group of risks determining the level of solvency of insurance companies calling it the qualified risks.

Their quantitative determination is impossible or with regard to special influence on level of solvency of an institution, such risks have to be separately supervised (different than quantitative supervision). The practice shows, that mistakes of company management, malfunctioning system of risk management, lack of effective system of internal audit can influence to a great extent the level of solvency of an insurer.

In Solvency II Project a structure of insurance supervision was proposed which conception is based on banking supervision system accepted in New Basel Capital Accord, that is on so called three pillars system.

II. THREE PILLARS SYSTEM

The main feature of a new model of supervision based on a system of three pillars is to concentrate its structure on the conception of capital weighed with risk. It is connected with appealing to particular types of risks which occur in frames of conducted insurance activity. Specific risks are assigned to specific sums. The total shows the capital weighed with risk, which is indispensable to retain the solvency of an insurance company. The project defines five groups of risks.

1. INSURANCE RISK – connected with construction of insurance products and pricing of premium as well as possibility of inappropriate risk assessment and pricings obligations with title of concluded contracts of insurance. There are some types of risks:

- **Underwriting Process Risk** – risk resulting from the only risk exposure to occurring financial losses resulting from the process of selection and acceptance of insured risks;

- **Pricing Risk** – risk of establishing insurance premiums by an insurance company on a level which is not sufficient to cover all obligations from portfolio of insurance contracts;

- **Product Design Risk** – risk that actual range of risk exposure diverges from the range assumed in the stage of creating and scaling of a product;

- **Claims Risk – for each peril** – risk that more claims take place than it had been assumed or that the amount of the claims exceeds its assumed amount, which results in unpredictable losses; such risk also includes further development of a claim after it had taken place and development of the cost of service and liquidation; it includes also risk accumulation, catastrophic risk and exceptional claims;

- **Economic Environment Risk** – risk that social and economic conditions would not change in such a way that it would have a negative impact on an insurance company;

- **Net Retention Risk** – risk that a higher own share results in financial losses in case of catastrophes and concentration of claims;

- **Policyholder Behaviour Risk** – unforeseen risk of retaining clients (insuring, being insured, entitled) which has a negative impact on an insurance company such as: earlier dissolution of contracts, realization of options to which clients are entitled;

- **Reserving Risk** – risk of creating reserves not sufficient to cover all obligations with the perspective to cover all obligations resulting from future obligations of insurance contracts.

2. THE CREDIT RISK – connected with impossibility (or lack of desire) of fulfillment of financial commitments by co-operating subject (broker, agent, insurer, reinsurer). The credit risk appears as a risk of bankruptcy or the deterioration in subjects emitting securities (being in the insurer's portfolio), the contracting parties, mediators. Such risk is connected with assets, and in addition, it can concern future money flows. We distinguish two types of credit risk: **type A** – connected with presently owned assets and capability of current credit risk management, **type B** – connected with credit risk of future reinvested assets when the necessity of reinvestment results from lack of possibility to cover obligations with assets accessible on the market .

There are some types of credit risk:

- **Direct Default Risk** – risk of not realizing financial obligations and other components of assets because of not realizing obligations by a contract party, with which an insurance company has contractual relations;
- **Downgrade or Migration Risk** – risk that change of probability of future solvency of a contracting party would have negative impact on current value of contracts concluded between an insurance company and such a contract party;
- **Indirect Credit or Spread Risk** – risk resulting from market opinion of increased risk connected with business cycles and other risks which have systematic character;
- **Settlement Risk** – risk of valuation connected with divergence between a date of account and a transaction date;
- **Sovereign Risk** – risk connected with exposition to losses as a result of decrease in the value of foreign assets and increase in the value of obligations denominated in foreign currencies in the range of non-market risks;
- **Concentration Risk** – risk of increased exposure to losses as a result of geographical and sectorial concentration as a part of conducted locational operations;
- **Counterparty Risk** – risk of change of the investment value of reinsurers and off-the-books items in case of due amounts or obligations have conditional character.

3. MARKET RISK – joins with a change in the Stock Exchange quotation or in prices in case of investment activity, change of interest rates, change of exchange rates, prices of property etc. It results from the risk of changeability and uncertainty connected with trading value of future money flows connected with both assets and liabilities. Therefore, market risk is connected with exposure to changes of level of financial variables such as share' prices, interest rates, exchange rates and many others. In addition, market risk is connected with fluency risk connected with the necessity to provide flow which is suitable taking into consideration security of prompt realization of required obligations (e.g. risk of necessity of selling assets in unfavorable market situation). Types of market risk:

- **Interest Rate Risk** – risk resulting from exposure to losses arising from change of interest rates;
- **Equity and Property Risk** – risk resulting from exposure to losses arising from changes of trading value of shares and other assets;
- **Currency Risk** – risk of decrease in the value of assets in foreign currencies or increase in the value of obligations nominated in foreign currencies resulting from changes of exchange rates;
- **Basis Risk** – risk that profitability of instruments of different credit credibility, fluency and requirement standards change in diverse way which results in changeability of trading value of financial instruments and which is independent from changeability of the value of obligations;
- **Reinvestment Risk** – risk connected with reinvestment of income from deposits in case of decrease in profitability below assumed level;
- **Concentration Risk** – risk of increased exposure to losses resulting from geographical and sector concentration as a part of conducted deposit operations;
- **Asset Liability Mismatch Risk** – risk connected with divergence in the rate and time schedule of financial flow from the assets covering obligations and financial flow resulting from realization of an insurance company obligations;
- **Off-Balance Sheet Risks** – risk connected with a change in the value of assets and liabilities which have conditional character, for example by virtue of exchange transaction which has swap character which fail to be reflected in balance sheet.

4. OPERATING RISK – connected with inappropriate functioning of the business processes in an insurance company (it can result from the lack of internal audit, human mistakes, technological breakdowns, malpractice etc). According to IAA (International Actuarial Association) report from 2002 operating risk can be divided into:

Internal risks

- **Human Capital Risk** – risk, that an insurance company is not able to keep and bear qualified workers and managers;
- **Management Control Risk** – risk that an insurance company is not managed in a proper way and activity of internal control is not satisfactory, applied internal procedures are not suitable or they are not obeyed;
- **System Risk** – risk of disturbances in an insurance company activity as a result of disorders in the work of computer systems;
- **Strategic Risk** – risk that an insurance company is not able to realize suitable plans of activity, make proper decisions, allocate the supplies or adapt itself in a different way to changeable conditions of the economical environment.

External risks

- **Reputation Risk** – risk that negative reputation or perception of an insurance company has negative impact on portfolio of customers, income or results in legal charges;

- **Disaster Risk** – risk that situations such as earthquakes, fires, floods, acts of terror make it impossible to effectively conduct operations by an insurance company;

- **Regulatory Risk** – risk of change of conditions of carrying out operations and competitiveness resulting from changes in legal regulations and their interpretation including tax authorities and court judicature.

Specificity of operating risk constitutes difficulty in elaboration of the correct methods of measurement, and in case of insurance companies it additionally means the necessity of allocating from insurance risk losses which results from realizing the elements of operating risk.

5. **LIQUIDITY RISK** – joins with lack of possibility to obtain financial means to cover insurers' prompt obligations, without incurrence of additional losses. There are some types of liquidity risks:

- **Liquidation Value Risk** – risk that unexpected demand for financial means in terms of time and amount requires selling assets in the period of unfavourable market conditions;

- **Affiliated Company Risk** – risk of limited flow of investment in partnerships related and resulting from that participation by an insurance company in the process of capitalization of affiliated companies;

- **Capital Market Risk** – risk that an insurance company is not able to gain sufficient sources of financing on the financial market.

To each pillar a separate category of risk connected with realization of insurance business was submitted. The first pillar includes quantitative risks relating to the technical and insurance reserves, the equity capital of institution (the minimum guarantee capital) as well as the insurer's deposits. In the second pillar a regulation connected with qualified risks and rules of realization of financial supervision was introduced as well as in case of financial supervision both within the frames of I and II pillar. Third pillar concerns the enlargements of disclosure of insurer's operations on the market and setting unified rules in sphere of duty of informative insurance company (especially in range of accountability).

The first pillar Solvency II principle

Supervision over the first pillar of a new system concerns quantity risks (quantitative). They can be estimated with the use of well-known models of risk assessment. They include risks concerning directly the insurance product (e.g. the calculation of fee, reinsurance), the market risks (especially the assessment

of value of capital deposits), the operating risks (e.g. failure of system, fraud) as well as the risks connected with technique *Assets – Liabilities Management (the ALM)* – the variables, interactions among the insurer's liabilities and assets.

Therefore, this insurance supervision in the range of the first pillar will focus on calculation of minimum insurer's financial categories. It concerns the following spheres included in Solvency II project: establishing of the minimum guarantee fund; appointing the proper technical and insurance reserves in property and life insurance sphere; establishing of principles relating to capital deposits.

With reference to the minimum guarantee fund, two-grade system has been proposed in the Project. It contains so called "*target capital level*" (TCL) as well as minimum capital – "*safety net*". According to a proposal of the Commission of Services liable for the works over Solvency II, by the target capital (the TCL) we understand the capital, which insurer should possess in order to realize insurance activity with definite quantitatively low probability of insolvency of the company. TCL calculation therefore takes into account majority of risks, which an insurance company is exposed to while realization of its activity. In this sense a height of TCL will also depend on the level of risks identified in II and III pillar.

The Commission of Services proposes the introduction of principles of calculation of the TCL based on using **internal models**. Having in attention striving to introduce unified rules for the whole market, the principles of opinion of internal models will be standardized on a community level. Thereby, the local offices of supervision will administer in range of opinions and admittances of concrete models with the same of instrumentarium of means in the whole area of UIM. "**Safety net**" is a minimum capital, being the absolute lowest limit, the finances of an insurance company can not decrease. In the Solvency II Project attention was paid also to a problem of technical and insurance reserves. The authors of the document propose to set up the standardized principles of calculation of reserves with the use of the internal models. So as in case of TCL models these would have to be accepted by supervision organs before their actual use. It means the need of establishment of the unified principles of establishing of these models. The range of financial quantitative supervision included also the matter of capital deposits of insurance companies. Attention was paid that relating deposits risks are not safely secured in valid system defining denominative principles of solvency of insurance companies. Therefore, the Commission of Services proposes to take into consideration risks resulting from deposits in the process of calculating TCL.

The second pillar Solvency II principle

The scope of action defined in the second pillar is a supplement to the first pillar conception. Not all risks can be measured in a proper way by determining only their numerical value. However, even those risks which are subject to the opinion with regard to their special influence on level of solvency of an insurance company must be subject to separate supervision (different than quantitative supervision described in frames of the first pillar). The second pillar is a basis of qualified supervision. Qualified supervision includes verification of such categories as: company management as well as risk management and internal audit within the company. *The level* of an insurance company management will influence the amount of TCL according to the regulations accepted by the Commission of Services.

The third pillar Solvency II principle

Supervision realized in the frames of the third pillar appears at first by reinforcement of the discipline within the conducted insurance activity. It should depend on establishment of the unified requirements relating to disclosure of the activities conducted by an insurance company in the frames the UIM. The conception of supervision is based on regulations of the third pillar and aims to produce more transparency in the sphere of activeness of a given company. The introduction of the standards defining the informative duty of a company is indispensable while continuing the process of limitation of part public administration on the market (deregulation of supervision).

III. INTERNAL MODELS OF RISK ASSESSMENT

The basic effect of introduction of Solvency II Project will be the possibility to use internal models in risk assessment of an insurance company. In respect to the banking market one should affirm, that the introduction of the internal models in risk assessment and risk management, at the same time resigning from imposing a standard methodology, contributed to development of a solid system of management in banks. One should therefore expect, that the introduction of similar regulations on the insurance market will be preceded by establishing of unified and consistent criteria of creating and use of internal models. The key issue is to define number of quantity and quality standards, fulfillment of which will be necessary to introduce systems of measurement and assessment of risk by an insurer. The basis of determining standards is unquestionably to define five categories of risk, which an insurance company is exposed to as a result of its activity. The integration of the indicated risks in frames of one model will be an unquestionable challenge. Difficulties in the construction of the model may

result not only from its complexity. As it is known, the internal model should be used in relation to a company as well as to a group. It should be supposed that influence on the level of target capital of individual risks is different depending on the country where a partnership belonging to a particular group operates.

IV. SUMMARY

The introduced outline of changes provided for Solvency II Project will be of crucial importance in development of the methods of risk management in insurance companies. The necessity of building of internal integrating models coming from different spheres of the insurers' activity will be an unquestionable challenge both for insurers and for people dealing with this issue scientifically. The experience of banking system, dependent on the similar regulations showed that it is particularly difficult to compare and compile the risks estimated in quantitative and traditional aspects. In case of insurers, the risk of activity has been so far estimated mainly paying special attention to insurance risk and constituted a basis to determine a guarantee fund. Therefore, the building of the models taking into account all kinds of risks which insurance companies are exposed to in frames of conducted activity shall be a new direction as far as the problem of risk in terms of an insurance company is concerned.

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*Piotr Brylikowski***MODEL OCENY RYZYKA ZAKŁADU UBEZPIECZEŃ W ŚWIETLE
PROJEKTU SOLVENCY II**

Zmiany zachodzące na światowym rynku ubezpieczeń spowodowały, iż przepisy w zakresie wypłacalności zakładów ubezpieczeń przestały odpowiadać nowym wyzwaniom jakie stanęły przed organami nadzoru. Projekt Solvency II ma na celu stworzenie systemu wypłacalności uwzględniającego profil ryzyka na jakie narażone są zakłady ubezpieczeń i zakłady reasekuracji w związku z prowadzona przez nie działalnością. Wprowadzenie nowego projektu wiąże się z koniecznością budowy systemów zarządzania ryzykiem. Systemy te muszą uwzględniać wszelkie ryzyka istotne dla zakładu ubezpieczeń z punktu widzenia prowadzonej działalności. Koniecznym okaże się budowa modeli oceny ryzyka uwzględniających ryzyka nie brane dotychczas pod uwagę przy ocenie wymagań kapitałowych dla zakładu ubezpieczeń. Sporym wyzwaniem może okazać się budowa modelu integrującego ryzyka przewidziane w projekcie Solvency II.