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Summary of the doctoral dissertation titled:

“The risk management system as a determinant of the financial efficiency of an insurance company”

The Act of 11 September 2015 on Insurance and Reinsurance Activity (Journal of Laws 2021, item 1130, as amended) defines the primary activity of insurance companies as performing insurance-related activities connected with offering and providing protection against the risk of consequences arising from random events. In market practice, there are many types of insurance contracts, which differ in terms of the risk covered, its nature, the detailed conditions for providing services and the characteristics of the contracting parties. Although insurance companies are fully professional entities towards their clients, they often fail to apply this professional approach to their own operations. Internal decisions and processes often do not account for the possibility that results may differ from those intended and do not include safeguards against such risks. It is common practice in insurance companies to understand risk narrowly, primarily in terms of the risk related to the insurance service itself, particularly its legal terms, the insured sum and the valuation expressed in the premium.

The implementation of a solvency system based on capital requirements significantly changed the perception of risk in the practice of insurance companies. The approach to risk management was changed, but it remained disconnected from operational activities. Focus shifted to complex models related to capital requirements. This stemmed from the development of the new legal framework, which was largely oriented around Pillar I – the quantifiable pillar. The second issue that insurance companies had to consider was meeting the requirements of Pillar III – reporting. Due to the above factors and the lack of clear guidelines, Pillar II, concerning the risk management system, was generally only preliminarily adjusted within insurance companies, mainly through the establishment of legally required institutions such as key functions.

It should be emphasised that the mathematical complexity of the analysed issues, the hypothetical nature of the assumptions and the difficulty of reflecting them in day-to-

day operations caused the system to become unclear and, in the view of decision-makers, irrelevant to the functioning of insurance companies. Work on this system was perceived as required solely by regulatory standards, very costly and executable only by actuaries. Consequently, in management's perception, risk management has become associated with the possibility of paying dividends at a specified solvency ratio.

As part of this doctoral dissertation, a review of the current situation in the Polish insurance market was carried out. In addition, an attempt was made to develop a risk management system for insurance companies that could help them gain a competitive advantage. The dissertation also addressed the tasks and operational principles of the risk management function, aiming to link it with business processes. Undoubtedly, the fundamental factor for the proper functioning of an insurance company is the potential return on the investment made by its owner. Therefore, following appropriate verification analyses, a modified ROE ratio is adopted as the measure of this return. In summary, the dissertation presents the assumptions of a comprehensive model for a risk management system that supports the organisation in making conscious and rational decisions through the lens of risk.

Due to the scope of the work, one specific risk module was selected for research purposes – insurance risk, which is crucial and fundamental to insurance activities.

The study set a cognitive objective: to develop a model for measuring the efficiency of an insurance company. This model incorporates assumptions from both systemic regimes: the ratio-based system (Solvency I) and the system based on stress tests and sensitivity analysis (Solvency II). The practical objective is to design a risk management system that increases the efficiency of the insurance company and to identify synergies within its operational processes.

In addition to these main objectives, the dissertation also defined supplementary goals. The first is to present a risk framework describing the operations of an insurance company and the correlations between risk modules. The second is to link the risk-based perspective with the existing ratio-based 'management'. The third is to identify the theoretical foundations of the risk management system and connect it with the process of managing the insurance company. The fourth is to discuss the assumptions regarding managerial information and its synergies with the risk management system. The final objective is to broaden the view of the risk management function beyond the capital solvency requirement.

The stated objectives lead to the verification of the main hypothesis that a risk management system constitutes a determinant of the efficiency of an insurance company. In addition, several supporting hypotheses were formulated and positively

verified: 1) despite legal regulations, there is no uniform approach to the quantification of risk modules within risk management systems; 2) management processes in insurance companies have been designed in an intuitive manner that reflects the main risks in their operations; 3) measuring the efficiency of an entity must take into account the specific nature of insurance activities and should be conducted in a multidimensional manner; 4) the risk management function must cooperate with organisational units as part of the processes taking place in the insurance company to increase its efficiency (organisational synergy); 5) when a risk management system extends beyond the scope of capital requirements, it positively affects the operational efficiency of the insurance company (substantive synergy); 6) a properly implemented risk management system should go beyond the tools arising from the Solvency II system (instrumental synergy).

As described in the study, the Polish insurance market exhibits different degrees of awareness among insurance companies regarding the potential use of a risk management system. This is evidenced by divergent principles for designing such systems, including the flow of managerial information, the scope of analysed issues and identified risks, and the methods used to manage them. These differences are reflected in the results achieved by individual entities, their financial security and the returns on investment generated for their owners. In the author's view, there are distinct levels of awareness concerning the practical application of risk management systems in the day-to-day operations of insurance companies. The dissertation identifies and describes three groups of entities. The first comprises companies in which the risk management system is effectively excluded from actual operational functioning and is limited solely to capital requirements, serving merely as a formal means of complying with regulatory standards. In this group, potential advantages associated with synergy are absent. First of all, organisational synergy does not occur, as the insurance company does not operate as a cohesive entity based on interconnected elements of the risk management system. Substantive synergy and instrumental synergy are also missing, because the organisation is not interested in any aspect of risk management other than calculating the capital requirement. In such cases, the risk management system essentially does not have any impact on other elements of the insurance company's operations and, consequently, does not contribute to improving efficiency.

The second group consists of companies whose risk management system includes the principles used in the process of calculating capital requirements – i.e., the standard perception of the risk management function – and applies them to the management of other areas. Partial organisational synergy is observed when the insurance company extends its risk measurement analysis beyond the percentile specified in the capital

requirement. A limited degree of substantive synergy is also demonstrated through the linkage between the calculation of the capital requirement and the pricing of insurance products. However, as the dissertation makes clear, these entities use different tools for calculating the capital requirement and assessing the insurance risk, meaning that instrumental synergy is absent. In summary, the study concludes that in this group, the existing risk management system does not constitute a factor supporting the efficiency of the insurance company.

The third group uses the risk management system as an actual second line of defence in the management of the insurance company. In this group, problems are examined and the company's risk appetite is confronted with its capital capacity, expressed partly through its risk tolerance limits. Organisational synergy occurs within the so-called 'three lines of defence' system. This goal is also supported by the use of an internal model and the principles of the Own Risk and Solvency Assessment (ORSA) in daily practice. Risk management decisions are designed to improve the company's security, regardless of whether they limit risk exposure or lead to the generation of profit while factoring in the desired risk appetite. Crucial to this decision-making process is a proper understanding of risk and its rational management to serve the established objectives. The reduction of the capital requirement is often sacrificed in the short term to ensure long-term security and the achievement of strategic objectives. There is extensive substantive synergy. Instrumental synergy is also natural; the dissertation demonstrates that this leads to a reduction of costs that would otherwise be duplicated if this synergy did not exist. In this context, the linkage of analytical and decision-making processes into a coherent risk management system indicates the maturity of an insurance company.

In addition, the dissertation highlights the low degree of conscious utilisation of the wealth of risk management theory in market practice as a concerning conclusion. In most cases, a conservative perspective on risk prevails, stemming from concepts related to insurance risk.

The presented work consists of an introduction, five chapters, a summary, a list of abbreviations, tables of contents, tables, diagrams, figures and a bibliography. The main body of the doctoral dissertation is divided into three parts comprising five chapters. The introductory part, covering the first two chapters, presents relevant theory, differences found in the literature and fundamental concepts. The principal section, also consisting of two chapters, presents the concept of measuring and the determinants of the financial efficiency of insurance companies, as well as the author's own research in this area. The concluding part, constituting the fifth chapter, presents

and summarises the model for evaluating an insurance company based on its risk management system. It also indicates directions for future changes and research in this area, as well as the practical applicability of this model in the operations of insurance companies.

Chapter one presents the definitions of the concepts of certainty and uncertainty. It includes a detailed discussion of the institution of risk within economic theory, outlining the main schools of thought in this area and the historical evolution of this concept. Subsequently, it highlights the significance of the concept of risk in insurance activities and its legal definitions set out in legal regulations. Furthermore, a segmentation of risk in the operations of insurance companies is carried out. The chapter presents a classification of risk according to the capital solvency requirement, the insurance company's management system, the systematics of the supervisory process, the classification used by the Polish Insurance Association and the categorisations applied by individual insurance companies. Analyses concerning insurance companies were conducted using current and historical solvency reports submitted by individual entities, in which all risks considered as significant to the company's operations are described each time.

The next chapter presents the general principles of the management system. It also indicates how the management system is described in the regulations governing insurance activities, including the assumptions concerning key functions, organisational structure and written policies. It discusses in detail the concepts of the risk management system and risk management and also describes the responsibilities between the first and second lines of the management system. Furthermore, it presents the information exchange model and the risk framework model, including the correlations between risks.

Chapter three focuses on the types of measurement and determinants of the financial efficiency of insurance companies. It presents the concept of financial efficiency and the assumptions related to its calculation. This part of the work emphasises a discussion of three methodological approaches to evaluating the functioning of an insurance company: ratio analysis, measurement based on the capital solvency requirement under the Solvency II system and alternative measurements, such as those based on qualitative assessment. Some of the presented and grouped ratio-based indicators describing insurance activities were subsequently used to construct the model of financial efficiency of insurance companies and to carry out a historical-comparative analysis of insurance companies on this basis. The analysis concerning the capital solvency requirement aimed to present the principles of risk measurement

applied within the Solvency II system under two methodological assumptions: the averaged approach underlying the standard formula and the internal model. The alternative measurements proposed in the dissertation and used in practice were intended to highlight potential synergies between the risk management system and other processes. The analysis of qualitative measurements served as a basis for including in the model those risks that are limited in quantitative measurement, partly due to insufficient data availability. In this context, the dissertation proposes a broader use of risk assessment tools that have so far been applied unilaterally, such as Business Impact Analysis. The chapter concludes with a section that integrates measurement possibilities derived from ratio analysis within ROE profitability measurement with measurements related to financial security defined under the Solvency II system. It presents a group of profitability indicators, including ROS, ROA and ROE, outlines the assumptions of the DuPont model and discusses the difference between ROE and the Solvency II system based on the capital solvency requirement.

Chapter four begins with the selection of the research sample. It consists of 10 medium-sized insurance companies offering insurance services or insurance and reinsurance services, in Division II – that is, other life and non-life insurance. The size of the insurance companies was determined using variables defined under both Polish accounting standards and the principles arising from the Solvency II system. In addition, assumptions applied by the supervisory authority in its supervisory process were used for research purposes. This group of entities conducts insurance activities in Poland on the basis of a domestic license to carry out insurance activities and is primarily subject to Polish supervision. Their legal form includes both joint-stock companies and mutual insurance associations. Moreover, a summary characterisation of these entities was provided, based on historical data. Subsequently, the research sample was verified. The second part of this chapter is devoted to the selection of tools used in the author's own research. It discusses the research assumptions, the metrics employed and the scope of risks analysed. At the same time, it presents the structure of the insurance risk module, which serves as a reference for the analysis of research results. The chapter concludes with a presentation of the assumptions for linking ratio analysis with individual types of risk within the DuPont model.

The final chapter presents a model for evaluating an insurance company based on its insurance risk management system. This part of the work presents and summarises the conclusions obtained from the conducted research and systematises insurance companies according to the assessed maturity of their risk management systems. It outlines the proposed structure of interconnected insurance risks within insurance activities. For individual risk sub-modules, specific variables are identified on the basis

of which the efficiency of an insurance company should be measured. Furthermore, the chapter proposes a potential organisational structure for an insurance company that takes into account the achievement of synergies between the risk management system and day-to-day operations.

To verify the research hypothesis, the dissertation employed empirical verification supplemented by logical verification through deductive analysis. The empirical verification focused exclusively on the observation method, using both non-participant and participant observation. Non-participant observation involved analysis of documentation, literature, statistical and financial data, as well as interviews and conversations with individuals responsible for the functioning of the risk management system in insurance companies, with persons managing insurance companies and with individuals involved in or designing the risk management system. As part of participant observation, the author was a participant in the studied phenomenon in the following roles: as an employee of an insurance company responsible for the risk management function and the compliance function; as a participant in a corporate group-level risk management system; as a representative in an economic chamber analysing the research problem under discussion; as a speaker at industry conferences, including within the framework of the European Financial Congress; and through professional experience gained while working at the supervisory authority.

In summarising the impact of the risk management system on an entity's profitability, it is necessary to highlight the cost aspect. As part of day-to-day operations, one of the fundamental functions of the risk management system should be to collaborate with other organisational units on developing safeguards against potential challenges. Knowledge in this area enables the reduction of costs that would otherwise be incurred if the risks were to materialise. The second source of cost optimisation is the ability to anticipate the impact of a given variable's evolution on other components of the organisation, including the possibility of rationally preparing for it, or even avoiding incurring costs in that area altogether.

According to theory, the materialisation of risk does not necessarily result only in financial loss. From this perspective, an effective risk management system is also a forum for discussing the positive utilisation of market environment volatility and for building a competitive advantage over other entities. This effect includes, for example, adapting to crisis situations faster than other entities, particularly by making quicker decisions. Such actions affect the profitability of entities in a multidimensional manner: they reduce costs, enable an earlier return to normal operations compared to other

entities and, in the long term, increase the entity's attractiveness in the eyes of counterparties, thereby lowering reputational risk.

The final aspect of improving profitability, though the most difficult to demonstrate, is the use of the natural tendency of the risk management system as a tool to mitigate the fluctuation of extreme events and the impact of the economic cycle. In this context, two issues must be highlighted. The first, easier to justify from a logical standpoint, is the situation where an entity inadequately prepared for an extreme event fails to withstand this challenge. The second case involves, on the one hand, achieving above-average profits or limiting losses during a positive economic cycle. However, even such conduct should be preceded by thorough risk analysis and the monitoring of evolving variables. It also appears that the functioning of the risk management system must become increasingly efficient when the organization is willing to raise its risk appetite.

In conclusion, the research conducted on the assessment of the insurance risk management system and its relation to the broadly understood performance of insurance companies and their ability to achieve general strategic objectives clearly confirms the thesis that the risk management system influences the efficiency of individual insurance companies. The companies identified in the study as the best performers – namely TUiR Warta SA, Wiener TU SA VIG and Uniqa TU SA – are simultaneously entities that achieve financial success in terms of market acquisition, financial security and return on invested capital.