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Contents

Introduction	9
Roman Asyngier: The effect of reverse stock split on the Warsaw Stock Exchange	11
Monika Banaszewska: Foreign investors on the Polish Treasury bond market in the years 2007-2013	26
Katarzyna Byrka-Kita, Mateusz Czerwiński: Large block trades and private benefits of control on Polish capital market.....	36
Ewa Dziwok: Value of skills in fixed income investments	50
Łukasz Feldman: Household risk management techniques in an intertemporal consumption model	59
Jerzy Gwizdała: Equity Release Schemes on selected housing loan markets across the world	72
Magdalena Homa: Mathematical reserves in insurance with equity fund versus a real value of a reference portfolio	86
Monika Kaczała, Dorota Wiśniewska: Risks in the farms in Poland and their financing – research findings	98
Yury Y. Karaleu: “Slice-Of-Life” customization of bankruptcy models: Belarusian experience and future development	115
Patrycja Kowalczyk-Rólczyńska: Equity release products as a form of pension security	132
Dominik Krężolek: Volatility and risk models on the metal market	142
Bożena Kunz: The scope of disclosures of fair value measurement methods of financial instruments in financial statements of banks listed on the Warsaw Stock Exchange	158
Szymon Kwiatkowski: Venture debt financial instruments and investment risk of an early stage fund.....	177
Katarzyna Łęczycka: Accuracy evaluation of modeling the volatility of VIX using GARCH model.....	185
Ewa Majerowska: Decision-making process: technical analysis versus financial modelling	199
Agnieszka Majewska: The formula of exercise price in employee stock options – testing of the proposed approach	211
Sebastian Majewski: The efficiency of the football betting market in Poland	222
Marta Malecka: Spectral density tests in VaR failure correlation analysis....	235

Adam Marszk: Stock markets in BRIC: development levels and macroeconomic implications.....	250
Aleksander R. Mercik: Counterparty credit risk in derivatives	264
Josef Novotný: Possibilities for stock market investment using psychological analysis	275
Krzysztof Piasecki: Discounting under impact of temporal risk aversion – a case of discrete time.....	289
Aleksandra Pieloch-Babiarz: Dividend initiation as a signal of subsequent earnings performance – Warsaw trading floor evidence.....	299
Radosław Pietrzyk, Paweł Rokita: On a concept of household financial plan optimization model.....	314
Agnieszka Przybylska-Mazur: Selected methods of the determination of core inflation	334
Andrzej Rutkowski: The profitability of acquiring companies listed on the Warsaw Stock Exchange.....	346
Dorota Skala: Striving towards the mean? Income smoothing dynamics in small Polish banks	364
Piotr Staszkiwicz, Lucia Staszkiwicz: HFT's potential of investment companies	376
Dorota Szczygiel: Application of three-dimensional copula functions in the analysis of dependence structure between exchange rates	390
Aleksandra Szpulak: A concept of an integrative working capital management in line with wealth maximization criterion.....	405
Magdalena Walczak-Gańko: Comparative analysis of exchange traded products markets in the Czech Republic, Hungary and Poland.....	426
Stanisław Wanat, Monika Papież, Sławomir Śmiech: Causality in distribution between European stock markets and commodity prices: using independence test based on the empirical copula.....	439
Krystyna Waszak: The key success factors of investing in shopping malls on the example of Polish commercial real estate market	455
Ewa Widz: Single stock futures quotations as a forecasting tool for stock prices.....	469
Tadeusz Winkler-Drews: Contrarian strategy risks on the Warsaw Stock Exchange	483
Marta Wiśniewska: EUR/USD high frequency trading: investment performance	496
Agnieszka Wojtasiak-Terech: Risk identification and assessment – guidelines for public sector in Poland	510
Ewa Wycinka: Time to default analysis in personal credit scoring.....	527
Justyna Zabawa, Magdalena Bywalec: Analysis of the financial position of the banking sector of the European Union member states in the period 2007–2013	537

Streszczenia

Roman Asyngier: Efekt resplitu na Giełdzie Papierów Wartościowych w Warszawie	25
Monika Banaszewska: Inwestorzy zagraniczni na polskim rynku obligacji skarbowych w latach 2007–2013	35
Katarzyna Byrka-Kita, Mateusz Czerwiński: Transakcje dotyczące znaczących pakietów akcji a prywatne korzyści z tytułu kontroli na polskim rynku kapitałowym	49
Ewa Dziwok: Ocena umiejętności inwestycyjnych dla portfela o stałym dochodzie	58
Łukasz Feldman: Zarządzanie ryzykiem w gospodarstwach domowych z wykorzystaniem międzyokresowego modelu konsumpcji	71
Jerzy Gwizdała: Odwrócony kredyt hipoteczny na wybranych światowych rynkach kredytów mieszkaniowych	85
Magdalena Homa: Rezerwy matematyczne składek UFK a rzeczywista wartość portfela referencyjnego	97
Monika Kaczała, Dorota Wiśniewska: Zagrożenia w gospodarstwach rolnych w Polsce i finansowanie ich skutków – wyniki badań	114
Yury Y. Karaleu: Podejście „Slice-Of-Life” do dostosowania modeli upadłościowych na Białorusi	131
Patrycja Kowalczyk-Rólczyńska: Produkty typu <i>equity release</i> jako forma zabezpieczenia emerytalnego	140
Dominik Krężolek: Wybrane modele zmienności i ryzyka na przykładzie rynku metali	156
Bożena Kunz: Zakres ujawnianych informacji w ramach metod wyceny wartości godziwej instrumentów finansowych w sprawozdaniach finansowych banków notowanych na GPW	175
Szymon Kwiatkowski: <i>Venture debt</i> – instrumenty finansowe i ryzyko inwestycyjne funduszy finansujących wczesną fazę rozwoju przedsiębiorstw ..	184
Katarzyna Łęczycka: Ocena dokładności modelowania zmienności indeksu VIX z zastosowaniem modelu GARCH	198
Ewa Majerowska: Podejmowanie decyzji inwestycyjnych: analiza techniczna a modelowanie procesów finansowych	209
Agnieszka Majewska: Formuła ceny wykonania w opcjach menedżerskich – testowanie proponowanego podejścia	221
Sebastian Majewski: Efektywność informacyjna piłkarskiego rynku bukmacherskiego w Polsce	234
Marta Małecka: Testy gęstości spektralnej w analizie korelacji przekroczeń VaR	249
Adam Marszk: Rynki akcji krajów BRIC: poziom rozwoju i znaczenie makroekonomiczne	263

Aleksander R. Mercik: Ryzyko niewypłacalności kontrahenta na rynku instrumentów pochodnych.....	274
Josef Novotný: Wykorzystanie analizy psychologicznej w inwestycjach na rynku akcji.....	288
Krzysztof Piasecki: Dyskontowanie pod wpływem awersji do ryzyka terminu – przypadek czasu dyskretnego.....	298
Aleksandra Pieloch-Babiarz: Inicjacja wypłaty dywidend jako sygnał przyszłych dochodów spółek notowanych na warszawskim parkiecie.....	313
Radosław Pietrzyk, Paweł Rokita: Koncepcja modelu optymalizacji planu finansowego gospodarstwa domowego.....	333
Agnieszka Przybylska-Mazur: Wybrane metody wyznaczania inflacji bazowej.....	345
Andrzej Rutkowski: Rentowność spółek przejmujących notowanych na Giełdzie Papierów Wartościowych w Warszawie.....	363
Dorota Skala: Wyrównywanie do średniej? Dynamika wygładzania dochodów w małych polskich bankach.....	375
Piotr Staszkiwicz, Lucia Staszkiwicz: Potencjał handlu algorytmicznego firm inwestycyjnych.....	389
Dorota Szczygieł: Zastosowanie trójwymiarowych funkcji copula w analizie zależności między kursami walutowymi.....	404
Aleksandra Szpulak: Koncepcja zintegrowanego zarządzania operacyjnym kapitałem pracującym w warunkach maksymalizacji bogactwa inwestorów.....	425
Magdalena Walczak-Gańko: Giełdowe produkty strukturyzowane – analiza porównawcza rynków w Czechach, Polsce i na Węgrzech.....	438
Stanisław Wanat, Monika Papież, Sławomir Śmiech: Analiza przyczynowości w rozkładzie między europejskimi rynkami akcji a cenami surowców z wykorzystaniem testu niezależności opartym na kopule empirycznej.....	454
Krystyna Waszak: Czynniki sukcesu inwestycji w centra handlowe na przykładzie polskiego rynku nieruchomości komercyjnych.....	468
Ewa Widz: Notowania kontraktów <i>futures</i> na akcje jako prognoza przyszłych cen akcji.....	482
Tadeusz Winkler-Drews: Ryzyko strategii <i>contrarian</i> na GPW w Warszawie.....	495
Marta Wiśniewska: EUR/USD transakcje wysokiej częstotliwości: wyniki inwestycyjne.....	509
Agnieszka Wojtasiak-Terech: Identyfikacja i ocena ryzyka – wytyczne dla sektora publicznego w Polsce.....	526
Ewa Wycinka: Zastosowanie analizy historii zdarzeń w skoringu kredytów udzielanych osobom fizycznym.....	536
Justyna Zabawa, Magdalena Bywalec: Analiza sytuacji finansowej sektora bankowego krajów Unii Europejskiej w latach 2007–2013.....	552

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RISK IDENTIFICATION AND ASSESSMENT – GUIDELINES FOR PUBLIC SECTOR IN POLAND

Summary: Risk management should become a very important part of the responsibilities of management and an integral part of the normal organizational processes in all public sector entities. The primary reason for managing risk in the public sector is enable entities to successfully achieve their goals included in the financial and non-financial plans, according to the requirements of the public law. The purpose of this paper is to work out guidelines for public sector in Poland in terms of two stages of the risk management process: risk identification and risk assessment. For proper risk identification and assessment two issues were initially undertaken: developing a clear definition of risk and selecting risk management approach. The author worked out risk typology which can be applied in the public sector risk management process and recommended some risk identification methods. Risk assessment is presented as a two-stage process. It includes risk analysis, which precedes risk evaluation. Methodology applied in the study includes desk research and semi-structured interviews conducted with representative of Lower Silesia Marshal Office and Governor's Office.

Keywords: risk management, risk identification, risk assessment, public sector risk.

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1. Introduction

The fundamental function of public sector entities is fulfilling public strategic goals and objectives in the most effective way, according to the defined time. Considering that achievement of goals and objectives can be affected by different types of risks, risk management should become a very important part of the responsibilities of management and an integral part of the normal organizational processes in all public sector entities.

The purpose of this paper is to work out guidelines for public sector in Poland in terms of two stages of the risk management process: risk identification and risk assessment.

The motivation for the research were conclusions included in the analyses of statements on management control (for 2010, 2011, 2012, 2013 submitted by the

ministers in charge of government administration) and annual reports for 2010, 2011 and 2012 – internal audit and management control in public sector issued by Ministry of Finance in Poland. Mentioned documents underline that risk management process is the component of management control which primarily needs improvement. As regulations in Poland allow adjust risk management process for specific needs of the entity and mentioned reports showed weakness of risk management process in Polish public sector author decided to limit scope of the paper to risk identification and assessment guidelines for domestic public sector.

In the first part of the paper author presents two important initial stages for proper risk identification and assessment: developing a clear definition of risk and adopting risk management approach. Author explains as well why the knowledge about risk management process from other sectors cannot be directly used in the public sector. Next author suggests focal points for risk identification and works out own risk typology which could be applied in the public sector in Poland. Risk assessment is described as a two-stage process. It includes risk analysis which precedes risk evaluation. Risk analysis involves evaluation of risk impact and likelihood, evaluation of risk interactions, defining level of risk and viewing the risk as a comprehensive portfolio. The second stage of risk assessment is risk evaluation which involves comparing the level of risk found during the analysis process with risk criteria established in the beginning of the risk management process.

Methodology applied in the study included desk research (review of the literature, review of the risk management international standards, review of the regulations and guidelines for risk management in the public sector in Poland, analysis of documents presenting risk management guidelines for non-public organizations and public sector entities in the USA, UK and Australia) and semi-structured interviews conducted with representative of Lower Silesia Marshal Office and Governor's Office.

2. Risk definition

There are two categories of risk definitions presented in the international standards, scientific papers and risk approaches applied by enterprises and public sector entities. The focal point is neutral or negative attitude towards the risk. Neutral approach appears for instance in the International Organization for Standardization (ISO) documents and is applied by all entities which base their risk management process on ISO recommendations. Under the ISO 31000:2009 and a consequential major revision of the terminology in ISO Guide 73, risk is the effect of uncertainty on objectives. An effect is a deviation from the expected result – positive and/or negative. Objectives can have different aspects (such as financial, health and safety,

and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process) [ISO 2009b]. The Committee of Sponsoring Organizations of the Treadway Commission (COSO) definition incorporates the notion that risk includes only downsides and focuses solely on the likelihood of bad things happening. Risk is understood as the possibility that an event will occur and adversely affect the achievement of objectives [COSO 2004a].

It is worth mentioning that the fundamental nature and consequences of risk apply equally to for-profit and not-for-profit organizations: in for-profit organizations risk is usually formalized as event, that if it occurs, will affect/adversely affect the achievements of financial objectives (returns), in not-for-profit organizations, risk is usually formalized as event, that if it occurs, will affect/adversely affect the achievements of stated quality objectives [Atkinson, Webb 2005].

For the purpose of this paper the author applies the Polish Ministry of Finance definition of the risk included in the “Recommendations for public sector for planning and risk management” [Minister Finansów 2012]. The regulation focuses on the negative aspect of risk and defines it as an event with the potential of negative influence on organization’s achievement of objectives. The public sector objectives, usually determined by a political process, can relate to a range of entity activities, from strategic to its operational activities. These include enacting legislation or regulations, delivering public goods and services, collecting income through mechanisms such as taxation, making social security payments and issuing securities [CIPFA, IFAC 2013].

3. Risk management process

Risk management is the process of systematic approach to the identification, analysis, evaluation, treatment and ongoing monitoring and communication of risk [McPhee 2005]. The process involves the identification of exposures to risk, the establishment of appropriate ranges for exposures (given a clear understanding of an entity’s objectives and constraints), the continuous measurement of these exposures (either present or contemplated), and the execution of appropriate adjustments whenever exposure levels fall outside of target ranges. Effective risk management requires the constant and consistent monitoring of exposures, with an eye toward making adjustments, whenever and wherever the situation calls for them [Maginn et al. 2007].

It is crucial to underline that in the last decade there are significant changes occurring in the practice of risk management, changes which, taken as a whole, are tending to redefine risk management of all organization’s risks on an integrated basis [Kjaer 2007]. An enterprise-wide risk management approach (ERM) is seen as the preferred approach to the risk management for both private and public entities. Table 1 shows differences between traditional risk management model and ERM.

Table 1. Traditional risk management model vs ERM

Traditional risk management	ERM
Risk as individual hazard	Risk in the context of business strategy
Individual risk management	Risk portfolio development
Risk mitigation	Risk optimization
Focus on all risks	Focus on critical risks
Risks limits	Risk strategy
Risk with no owners	Defined risk responsibilities
Risk is not my responsibility	Risk is everyone's responsibility

Source: [KPMG 2001].

The most commonly used approaches to risk management in the public sector, based on ERM, are these included in the risk management standards worked out by two organizations:

- COSO – risk management approach is included in the publication *Enterprise Risk Management – Integrated Framework* [COSO 2004a] and
- ISO – risk management approach is included in the standard ISO 31000:2009 – *Risk Management – Principles and Guidelines* [ISO 2009a].

According to COSO, enterprise risk management is a process effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives. Enterprise risk management consists of eight interrelated components:

- internal environment,
- objective setting,
- event identification,
- risk assessment,
- risk response,
- control activities,
- information and communication,
- monitoring [COSO 2004a].

ISO standard defines risk management as a process which aids decision making by taking account of uncertainty and its effect on achieving objectives and assessing the need for any actions. Risk management process involves applying logical and systematic methods for:

- communication and consultation throughout the process,
- establishing the context (defining what the organization wants to achieve and the external and internal factors that may influence success in achieving those objectives),

- identifying, analyzing, evaluating and treating risk associated with any activity, process, function, project, product, service or asset,
- monitoring and reviewing risk,
- recording and reporting the results appropriately [ISO 2008].

Recommendations for public sector for planning and risk management issued by Polish Ministry of Finance adopt integrated approach to risk management. They follow standards for the risk management established by COSO, ISO, Federation of European Risk Management Associations (FERMA), International Organization of Supreme Audit Institutions (INTOSAI), the Institute of Internal Auditors (IIA) and requirements established by the European Commission.

Taking into the account the remarks given above author defines risk management as a process of decision making, which includes identifying, analyzing, evaluating and responding to risk. It is a proactive, anticipative, and reactive process that continuously monitors and controls risk. The risk management process should be an integral part of management, be embedded in culture and practices and tailored to the character of the entity. Entity approach to the risk management process should be included in the risk strategy executed by risk management structure or framework. The framework provides the foundations and organizational arrangements that will embed it throughout the organization at all levels.

The paper deals with some steps of risk management process: risk identification, risk analysis and risk evaluation. Within risk management process recommended by ISO, risk identification, analysis and evaluation constitute risk assessment [ISO 2008]. COSO ERM framework and approach applied by Polish Ministry of Finance, adopted in this article, include only risk analysis and evaluation in the risk assessment [COSO 2004a; Minister Finansów 2012].

4. Risk management process specificity in the public sector

The primarily reason for managing risk in the public sector is enable entities to successfully achieve their goals included in the financial and non-financial plans, both short and long term, according to the requirements of the public law.

To some extent guidelines for risk management created for non-public sector can be implemented in public sector. But designing risk management process for the public sector we must consider that:

- this process must be compliant with regulations established for the public sector risk management,
- there are no specific departments dedicated particularly for the risk management in the public sector entities,
- types of operations (and their goals) of the public sector entities are in great scope different that operations conducted by private sector ones,
- public sector entities present an exposure to risk that is substantively different from a private entity (risk within a public sector organization is much broader

than the traditional private sector financial or capital project risks) [Cooper 2010],

- the characteristics of public risks present a set of risk management issues not fully present in the private sector, including (for example: inability of government to avoid responsibility for risks within its purview, complexity of relationships between risks) [Young 2007],
- the financial resources which can be allocated for the risk management process in the public sector entities can be significantly lower than in private sector what will influence the selection of risk identification and assessment methods,
- risk appetite and risk tolerance in the public sector will be generally lower than in private sector,
- public sector entities are limited with the instruments which they are able to use in response to risk.

It must be underlined that risk management is an important component of public governance. New Public Governance (NPG) is rooted firmly within organizational sociology and network theory. Its focus is very much upon inter-organizational relationships and the governance of processes, and it stresses service effectiveness and outcomes. Further, it lays emphasis on the design and evaluation of enduring inter-organizational relationships, where trust, relational capital and relational contracts act as the core governance mechanisms [Bovaird 2006; Teicher, Alam, van Gramberg 2006]. Only proper risk management can provide reasonable assurance regarding services effectiveness and outcomes with respect to governance mechanisms.

5. Risk identification

Good risk management requires an interdisciplinary, and interdepartmental effort to identify a wide variety of risks. The risk identification process can generate a comprehensive list of threats and opportunities based on those events that might create, enhance, prevent, degrade, accelerate or delay the achievement of the entity objectives. As risk is defined like an event with the potential of negative influence, we are only interested in the identification of threats. Comprehensive identification is crucial, because a risk that is not identified at this stage will not be included in the further analysis [ISO 2008]. Risk identification also requires an ongoing effort to scan the environment for emerging and changing risk conditions in order to regularly review and refocus resources to meet emerging priorities and threats [Hill 2000].

For proper risk identification several important issues must be clarified. They are: defining and understanding strategies and objectives, defining focal points for risk identification, selecting risk identification techniques, establishing risk categories and sub-categories and analyzing causes of the risk. Listed issues were worked out on the basis on analysis of risk management guidelines developed for some specific public sector entities: Western Australia Government Agencies, Queensland Government,

Lover Silesia Marshal Office, Lover Silesia Governor's Office and Province of British Columbia. The sources of defining necessary steps for proper risk identification were as well recommendations designed for public sector in general (included for instance HM Treasury Orange Book) and for all sectors (included in ISO standard and COSO standard).

5.1. Defining and understanding strategies and objectives of the entity

Approach based on enterprise risk management (ERM) takes a broad perspective on identifying the risks that could cause an organization to fail to meet its strategies and objectives. Taking that into account, the initial focus is on clarity of them. Without clear objectives it is impossible to identify events that might give rise to risks that could impede the accomplishment of a particular strategy or objective.

5.2. Defining focal points for the risk identification

Risk identification can be carried out for different levels of organization. Drennan and McConnell [2007] make one significant distinction between risks according to entity's level: those that arise and require to be dealt with at a strategic level and those which are more relevant at the day operational level of the organization. Accountability for the risks that arise at the strategic level lies in the case of local or national government with the elected members. At the operational level, risk is present in the day-to-day functions and services of the public body. Such risks might derive from the people, property or processes involved in delivering quality of service expected from the organization. Here, the responsibility for managing risk lies with every individual employee, on a daily basis.

The focal points for risk identification and next risk assessment can be:

- objectives and activities defined for the processes – entity operations can be divided into processes according to applied process classification scheme and risk is assigned to each process. Processes categories are further broken down into sub-processes. The entity must devise its own framework for organizing its processes classification scheme to supplement its risk language and populate that framework over time. There are many examples of a processes classification schemes. We can list for example those introduced by Porter [1985] or American Productivity Quality Center. Process classifications analysis, carried out for the Polish public sector entities, proves that processes are usually divided into three groups: management processes, operating processes and support processes. For each process within the group its objectives, tasks and measures are defined. Risk from internal and external sources is identified for all processes in terms of events that can have negative influence on accomplishing these tasks and objectives;

- objectives and activities assigned to the functional areas – jobs within the organizational hierarchy are grouped by functions. Using a functional organizational structure, upper management can segregate activities of different departments. For each department within the entity its objectives, tasks and measures are defined. Risk from internal and external sources is identified for all departments in terms of events that can have negative influence on accomplishing these tasks and objectives.

Semi-structured interviews with representatives of Lower Silesia Marshal Office and Governor's Office indicated that in the Polish public sector focal points for risk identification and next risk assessment are objectives and activities assigned to the functional areas (Marshal Office) or objectives and activities defined for the processes (Governor's Office).

5.3. Using a combination of techniques

Using a combination of techniques for risk identification may produce a more comprehensive list of risks than would reliance on a single method. The techniques applied should encourage open and frank discussion, and individuals should not fear reprisal for expressing their concerns about potential events that would give rise to risks resulting in fouling to meet objectives. Analysis of risk identification techniques recommended by different organizations let the author select the ones, which could be applied in the public sector in Poland. They are: SWOT analysis, PESTEL analysis, documentation review, brainstorming session, Delphi technique, interview, risk questionnaires and surveys, self-assessment, facilitated workshops, event inventory, process flow analysis [Western Australia Government 2011; Queensland Government 2011; IMA 2007; Protiviti 2006; Province of British Columbia 2012; COSO 2004b].

5.4. Establishing risk categories and sub-categories

Once risks are identified some organizations find it helpful to categorize them. List of risks should be organized by risk category and sub-category [Curtis, Carey 2012]. This may be necessary if the risk identification process produces hundreds of risks, which can be overwhelming and seem unmanageable. Categorizing risk requires an internal risk language or vocabulary that is common or unique to the organization in total [IMA 2007]. COSO points out that "event categorization [...] allows management to consider the completeness of its event identification effort." A common language enables employees to communicate more effectively and identify relevant issues more quickly.

There are many ways of describing or categorizing risk. According to Kaplan and Mikes [2012] risks fall into one of three categories:

Category I: Preventable risks. These are internal risks, arising from within the organization, that are controllable and ought to be eliminated or avoided. Examples are the risks from employees' and managers' unauthorized, illegal, unethical, incorrect, or inappropriate actions and the risks from breakdowns in routine operational processes. In general, entities should seek to eliminate these risks since they get no strategic benefits from taking them on. This risk category is best managed through active prevention: monitoring operational processes and guiding people's behaviors and decisions toward desired norms.

Category II: Strategy risks. Strategy risk, may be defined as the risk associated with initial strategy selection, execution, or modification over time that results in a lack of achievement of overall objectives [Chapman 2006]. They are those events which could significantly impact on the achievement of the entity's vision and strategic objectives as documented in the strategic plans [Queensland Government 2011]. Strategy risks are quite different from preventable risks because they are not inherently undesirable. Strategy risks cannot be managed through a rules-based control model. Instead, organization needs a risk-management system designed to reduce the probability that the assumed risks actually materialize and to improve the entity's ability to manage or contain the risk events should they occur.

Category III: External risks. Some risks arise from events outside the entity and are beyond its influence or control. Sources of these risks for public sector entities include natural and political disasters, major macroeconomic shifts, social, technological and demographic trends.

Similar typology of risk is used by Atkinson and Webb [2005]. They call mentioned above risk categories: operational risk, strategic risk and environment risk.

The Treasury's Orange Book on risk management recommended that public sector bodies should take into consideration three main categories of risk: external risks, operational risk and risk associated with organizational change. The external risk category includes political, economic, socio-cultural, legal/regulatory and environmental risks. Operational risks are associated with the delivery of services and/or products, as well as the availability of internal organizational capacity, including risk management expertise. Risk associated with organizational change refers to all activities and actions going beyond current organizational capabilities [HM Treasury 2004].

Some classifications group risk into financial risk and nonfinancial risks. Maginn et al. [2007] relate financial risk to all risks derived from events in the external financial markets, nonfinancial risk to all other forms of risk. According to this categorization financial risk includes: market risk (interest rate risk, exchange rate risk, equity price risk, commodity price risk), credit risk and liquidity risk. Nonfinancial risk includes operational risk, model risk, settlement risk, regulations risk, legal risk, taxes risk and accounting risk. Croughey, Galai and Mark [2006] to the category of financial risk qualify market risk and credit risk and to the category of

nonfinancial risk: liquidity risk, operational risk, legal and regulatory risk, business risk, strategic risk and reputation risk.

It is recommended to avoid using generic risk categories as context for risk identification, as this can seriously limit the thoroughness of risk assessment and can result in key risks being missed. The categories of risk can then be further decomposed into more specific sub-categories. In theory the more all-encompassing the categorization and the more detailed the decomposition, the more closely the entity's risk will be captured. In practice, this process is limited by the type of organization, risk management complexity that can be handled by the available technology and risk owners, and by the cost and availability of internal and market data [Croughy, Galai, Mark 2006].

Risk management policy included in the regulations applied by Polish self-government entity on the regional level – Lower Silesia Marshal Office and government entity which represent central administration in the region – Lower Silesia Governor's Offices includes four risk categories and sub-categories: financial risk (which includes budget risk, fraud and theft risk, insurable events risk, public procurement risk, civil liability risk, financial reporting risk), human resources risk (underemployment risk, competence risk, human health and safety risk), operational risk (internal regulations risk, organizational structure risk, internal control risk, information risk, reputation risk, technology risk), external risk (infrastructure risk, legal risk, political risk, economic risk).

Table 2. Risk categories and sub-categories

Risk category	Risk sub-category
Strategy risk	<ul style="list-style-type: none"> • Vision risk • Strategic objectives risk
Internal risk	<ul style="list-style-type: none"> • Operational risk (for example: Internal regulations risk, Responsibilities and authority risk, Organizational structure risk, Internal control risk, Information risk, Reputation risk, IT systems and equipment risk) • Human resources risk (for example: Under/over employment risk, Competence risk, Human health and safety risk) • Internal financial risk (for example: Budget risk, Fraud and theft risk, Insurable events risk, Public procurement risk/contractual risk, Civil liability risk, Financial reporting risk) • Model risk
External risk	<ul style="list-style-type: none"> • Economic risk (for example: Inflation risk, Unemployment risk, GDP growth risk, International trade risk) • External financial risk (for example: Interest rate risk, Exchange rate risk, Equity price risk, Commodity price risk, Credit risk, Liquidity risk) • Political risk • Legal risk • Environment risk • Social risk • Technological risk • Demographic risk • Suppliers of goods and services for public sector risk

Source: own elaboration.

Taking into the account included in the literature risk typology, Polish Ministry of Finance recommendations and practices in the Polish public sector, the author worked out three risk categories and within them some sub-categories. They are presented in Table 2.

Strategy risk includes risks inherent in the critical strategies appropriate to enable the organization to meet its main objectives.

Internal risk is present in day-to-day functions and services of the public body, may affect organization's ability to deliver on its strategic objectives.

External risk is risk derives from the economy, social trends or natural environments, technology development and is largely out of control of organization.

Financial risk was broken into the two components: Internal financial risk and external financial risk. Internal financial risk is associated with financial planning and control, public expenditures, income generation and the adequacy of insurance or other financial cover when a loss occurs, typically is well controlled and is a part of the routine board risk discussions, with strong impetus coming from the increased regulatory, accounting and financial audit focus. External financial risk arises from events outside entity and is beyond its influence or control.

5.5. Identifying causes of risk

For each risk entity should identify possible causes of the risk event. Each risk may have one or more causal factors which can either directly or indirectly contribute to the risk event occurring. Identifying the range of causes will assist in understanding the risk, identify controls, evaluate the adequacy of existing controls and design effective risk treatments [Western Australia Government 2011].

6. Risk assessment

Risk assessment allows an entity to consider the extent to which potential events have an impact on achievement of objectives. Management can assess events from two perspectives – likelihood and impact – and can use a combination of qualitative and quantitative methods. Risk assessment includes:

- analyzing the risk, and
- evaluating the level of risk against a pre-defined acceptance criteria.

Risk is assessed on both an inherent and a residual basis. Inherent risk is the risk to an entity in the absence of any actions management might take to alter either the risk's likelihood or impact. Residual risk reflects the risk remaining after management's intended actions to mitigate an inherent risk have been effectively implemented [COSO 2004b]. It must be pointed out, that risk should be assessed first on inherent basis and then on a residual basis.

6.1. Risk analysis

Risk analysis provides an input to risk evaluation, decisions on whether risks need to be treated and on the most appropriate risk treatment strategies and methods. Risk analysis should involve consideration of: the likelihood and impact of risk event – indicated on assessment scale, risks interactions, level of risk and viewing the risk as a comprehensive portfolio.

6.1.1. Evaluation of impact and likelihood

The main part of risk analysis is evaluation of impact and likelihood of risk event on objectives achievement. Impact refers to the extent to which a risk event might affect the organization. Likelihood represents the possibility that a given event will occur.

There are many methods for measuring impact and likelihood. Risk assessment techniques vary from qualitative to quantitative. While some qualitative risk assessments are put forth in subjective terms, and others in more objective ones, the quality of the assessments depends largely on the knowledge and judgment of the individuals involved, their understanding of potential events, and the surrounding context and dynamics [COSO 2004b]. Quantitative analysis requires numerical values for both impact and likelihood using data from a variety of sources. The quality of the analysis depends on the accuracy and completeness of the numerical values and the validity of the model used [Curtis, Carey 2012].

Advantages and disadvantages of qualitative methods are presented in Table 3.

Table 3. Advantaged and disadvantages of applying qualitative techniques for risk impact and likelihood measurement in the public sector

Advantages	Disadvantage
<ul style="list-style-type: none"> • Is relatively quick and easy • Provides rich information beyond financial impact and likelihood and non-financial impacts • Is easily understood by a large number of employees who may not be trained in sophisticated quantification techniques 	<ul style="list-style-type: none"> • Gives limited differentiation between levels of risk (i.e. very high, high, medium, and low) • Is imprecise – risk events that plot within the same risk level can represent substantially different amounts of risk • Cannot numerically aggregate or address risk interactions and correlations

Source: [Curtis, Carey 2012].

The way in which impact and likelihood are measured in the public sector entities depends on:

- practices applied in the public sector entities worldwide,
- international standards on risk assessment,
- recommendations on the national level,

- public sector entity level of maturity in the Risk Maturity Model,
- the complexity of the method,
- the decision of management,
- the availability and type of data,
- cost-effectiveness of applied method,
- type of risk.

In estimating likelihood and impact of potential events organizations apply rating scales. They are defined in relation to organizations' objectives in scope. Without a standard of comparison it's not possible to compare and aggregate risks across the organization. Scales for rating risks in terms of impact and likelihood comprise rating levels and definitions that foster consistent interpretation and application by different constituencies.

When assigning an impact rating to a risk, the rating for the highest consequence anticipated must be assigned [Curtis, Carey 2012]. Usually used scales are: minor, moderate, significant or insignificant, minor, moderate, major, catastrophic (critical) [Western Australia Government 2011; The State of Queensland 2011]. In the Lower Silesia Governor's Office impact of potential event is expressed as insignificant, minor, significant, catastrophic [Zarządzenie Nr 327 2011], in the Lower Silesia Marshal Office as low, medium, high [Zarządzenie Nr 77/2007].

Likelihood can be expressed using qualitative terms, as a percent probability, or as a frequency. Usually used scales are: unlikely, possible, likely [The State of Queensland 2011] or rare, unlikely, possible, likely, almost certain [Province of British Columbia 2012]. In the Lower Silesia Governor's Office likelihood of potential event is expressed as low, moderate, high, almost certain [Zarządzenie Nr 327 2011], in the Lower Silesia Marshal Office as low, medium, high [Zarządzenie Nr 77/2007].

6.1.2. Evaluation of risk interactions

ERM enables an integrated view of risks. The key here is that the whole does not equal the sum of the parts. To understand portfolio risk, one must understand the risks of the individual elements plus their interactions. A way to consider risk interactions is to group related risks into a broad risk area and then assigning ownership and oversight for the risk area. The simplest form of graphical presentation of risk interactions is risk interaction map [Curtis, Carey 2012].

6.1.3. Defining level of risk

The level of risk is calculated by multiplying the consequence and likelihood ratings [Western Australia Government 2011]. The level of risk will vary for inherent and residual risk. All risks will have an inherent level of risk. Having information available which relates to this inherent risk level means that, when considering the

adequacy of risk treatment tools, the inherent or worst-case scenario (no risk-treatment tools established or failure of tools) is known. Residual risk assessment considers both the risks as previously identified and the related risk response mechanisms and control activities. In other words, it evaluates the adequacy and effectiveness of the risk responses in place, providing reasonable assurance that the likelihood and impact of an adverse event are brought down to an acceptable level [PricewaterhouseCoopers 2008].

6.1.4. Viewing the risk as a comprehensive portfolio

Once the risks have been analyzed and their interactions documented, it's time to view the risks as a comprehensive portfolio. The most often used, by the public sector entities, way to view the portfolio is to create a risk map (heat map). It is usually two-dimensional representation of impact plotted against likelihood. Risks are prioritized by designating a risk level for each area of the graph such as very high, high, medium, or low, where the higher the combined impact and likelihood ratings, the higher the overall risk level. The boundaries between levels vary from entity to entity depending on risk appetite [Curtis, Carey 2012]. Next, the rank risk order should be reviewed in light of additional considerations (for instance impact alone, interaction with other risks, gap between current and desired risk level).

6.2. Risk evaluation

The next step, after risk analysis, is to evaluate the risk and see where the risk fits against the entity's overall risk criteria [Western Australia Government 2011]. Risk evaluation is a process based on the outcome of risk identification and analysis, which lets determine which risks should be treated and assign priority for treatment implementation. While each risk captured may be important to management at the function or process, the list requires prioritization to focus senior management and board attention on key risks. Risk evaluation involves comparing the level of risk found during the analysis process with risk criteria developed as part of setting the overall risk management framework. Risk criteria refer to risk appetite and risk tolerance. Risk appetite is the amount of risk, on a board level, an entity is willing to accept in order to achieve strategic goals. It reflects the entity's risk philosophy, and in turn influences the entity's culture and operating style. Risk tolerance (risk limit, risk threshold) is the acceptable level of variation relative to the achievement of a specific objective, and should be weighted using the same unit of measure applied to the related objective. Risk tolerance can vary from one risk type to another, depending on the importance to the organization's mission, values and objectives [Protiviti 2006; The State of Queensland Treasury 2011].

7. Conclusions

Risk management process, considered on integrated basis, becomes a very important part of overall management of public sector entities. The objective of the research was to work out guidelines for public sector in Poland in terms of two stages of the risk management process: risk identification and risk assessment. The study constitutes a systematic introduction to substantial issues of risk management.

Within the risk identification it is necessary to undertake some important issues like: defining goals and objectives for which risk will be identified, indicating focal points and selecting techniques for risk identification, establishing risk categories best suited for the public sector. The author recommended some risk identification techniques and worked out own risk typology which could be applied by the public sector entities in Poland.

Risk assessment should be treated like two-stage process, including risk analysis and risk evaluation. In particular the author pays attention that during the risk analysis it is necessary to determine causes of risk, their impact and the likelihood on objectives achievements, assess level of risk and prioritize it. Risk evaluation should enable to compare the level of risk found during the analysis process with risk criteria applied in risk management process. The author recommends that selection of risk assessment methods in the public sector should be preceded by analysis of practices applied in the public sector entities worldwide, international standards on risk assessment, recommendations on the national level, public sector entity level of maturity in the Risk Maturity Model, the complexity of the method, the availability and type of data, cost-effectiveness of applied method and type of risk.

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IDENTYFIKACJA I OCENA RYZYKA – WYTYCZNE DLA SEKTORA PUBLICZNEGO W POLSCE

Streszczenie: Proces zarządzania ryzykiem powinien stanowić jeden z kluczowych elementów procesu zarządzania w każdej jednostce sektora finansów publicznych. Główną przyczyną zarządzania ryzykiem w sektorze publicznym jest zapewnienie realizacji celów zawartych zarówno w planach finansowych jak i niefinansowych, ustalonych zgodnie z zapisami prawa finansowego. Celem artykułu jest opracowanie wytycznych dla sektora publicznego w Polsce w zakresie dwóch elementów procesu zarządzania ryzykiem: identyfikacji ryzyka i oceny ryzyka. Autorka podkreśliła ponadto, iż identyfikacja i ocena ryzyka powinny być poprzedzone przyjęciem określonej definicji ryzyka oraz wyborem podejścia do procesu zarządzania ryzykiem. W ramach identyfikacji ryzyka autorka przedstawiła następujące elementy: zdefiniowanie celów i zadań, w odniesieniu do których ryzyko będzie identyfikowane, wybór metod identyfikacji ryzyka, analizę przyczyn ryzyka i podział ryzyka na kategorie. Zaproponowała własną typologię ryzyka, która może być stosowana w sektorze finansów publicznych oraz wybrała określone metody identyfikacji ryzyka. Ocena ryzyka jest przedstawiona jako proces składający się z następujących etapów: określenia skutku i prawdopodobieństwa wystąpienia danego rodzaju ryzyka, oceny powiązań między różnymi rodzajami ryzyka, oszacowania poziomu ryzyka oraz porównania go z przyjętym poziomem tolerancji.

Słowa kluczowe: zarządzanie ryzykiem, identyfikacja ryzyka, ocena ryzyka, ryzyko w sektorze publicznym.