

RISK IN COMPANY OPERATIONS

Introduction

Risk in business operations is the consequence of the variable surrounding, the economic freedom and the lack of various restrictions that exist in market economy. As a result, the economic risk is an inseparable element accompanying any business operations. In economy, risk is defined as the possibility to obtain results that differ from the assumed targets. The difference from the assumptions may be either advantageous or disadvantageous. From the point of view of an economic entity the advantageous results are considered to be an opportunity. Unfortunately, a reverse situations may result in the possibility of facing a loss.

Economic entities aim at taking various measures to limit the negative effects of risk. One of the ways in this respect is the creation of reserves for future liabilities.

The article presents basic issues related to the risk in business operations and the principles of creating reserves in financial accounting. In its final part, an analysis of selected companies from construction sector will be conducted. The aim of the analysis will be to investigate to what degree the selected entities created reserves during the latest financial crisis.

The article consists of five parts. The first three concern the risk and issues related to risk management in companies. The fourth part presents reserves in accounting as the instrument whose objective is to limit the effects of risk in an economic entity. The last part includes the analysis of the scope of reserve creation in the construction sector companies. The choice of the group under investigation is not accidental as especially this sector was affected by the crisis.

1. The notion of risk

The notion of *risk* is interpreted differently in various areas of science and consequently, according to some authors, the formulation of one universal definition of risk is impossible¹.

In neo-classical considerations the economists used the term of *uncertainty* instead. F.H.Knight was among the first ones to distinguish the two notions. He defined risk as the uncertainty that can be quantified, while uncertainty that cannot be measured constitutes uncertainty *sensus stricto*. Thus, risk is a particular case of uncertainty. Consequently, one can use the term risk only when for a given operation the set of potential outcomes is known as well as the occurrence probability for each of the outcomes. In the case of uncertainty however, the set of potential outcomes is known, yet the occurrence probability for each of the operation outcomes cannot be determined.

As regards the perception of risk, there are two dominating approaches in the literature on the subject: a defensive and offensive one. In the defensive approach risk is considered a negative phenomenon which results in a loss in business operations. That approach is represented mainly by German economists. For example, B.Bruchwiler defines risk as “the threat of a negative deviation from the target”². In the same approach, according to F.Philipp risk is “the potential to make a faulty decision”³. The approach to risk as a negative factor is also shared by other scientists. According to F.Orłowicz, risk is “the calculated or estimated possibility to miss the assumed targets, which -as the hazards related to the operation may occur- poses a danger to the decision maker when he/she is not sure if they may occur and cause damage but is certain that despite their occurrence, the decision is optimal”⁴.

The other approach, i.e. the offensive one, treats risk as an inherent feature of business operations and considers risk not only as the source of loss but also as the source of potential profits. That approach is represented, among others, by P.F. Drucker, H. Braun, L. Osiatyński and W. Grzybowski. For example, L.Osiatyński defines risk as “a dangerous to the economic entity possibility of a complete or partial failure of projects or operations involving dangers that the decision maker is aware of but has no *a priori* certainty as regards their occurrence or

¹ Cf. S. Nahotko, *Ryzyko ekonomiczne w działalności gospodarczej*, Zeszyt 201, OPO, Bydgoszcz 2001, pp. 37-38,42

² B. Bruhwiler, *Risk Management – eine Aufgabe der Unternehmensführung*. Verlag Paul Haupt, Bern, Stuttgart 1980, p. 40 [in:] K. Jędralska, *Zachowania przedsiębiorstw w sytuacjach niepewnych i ryzykownych*, AE w Katowicach, 1992, p. 49

³ F. Philipp, *Risiko und Risikopolitik*, C.E. Poeschel Verlag, Stuttgart 1967, p. 13 [in:] K. Jędralska, *Zachowania przedsiębiorstw w sytuacjach niepewnych i ryzykownych*, AE w Katowicach, 1992, p. 49

⁴ F. Orłowicz, *Ryzyko gospodarcze a prawo karne*, „Nowe prawo”, No 3/1968

the amount of loss and takes the responsibility for their potential consequences.”⁵ And further on: „ risk has a negative connotation in the economic sense (the positive equivalent of *risk* is opportunity) ”.⁶ Sometime later, in 1976 W.Grzybowski pointed out to two aspects of risk: „ risk, which poses the danger of the occurrence of a negative deviation – an economic loss, must also create an opportunity to achieve benefits over the predicted state of balance or, at least to reach the balance.”⁷

There is one more approach in the literature on the subject as regards the notion of risk. It is the psychological approach in the risk analysis, i.e. the one that refers directly to the decision maker. That approach appears in the works of, among others, J. Koziński, R. Kietliński⁸ and T. Kotarbiński⁹. According to them, the decision maker determines in a subjective way the probability of the occurrence of a risky situation and takes necessary steps with the consideration of the degree of risk and his/her preferences in this respect. The experiments conducted by R.Kietliński show that people take two variables under consideration when making decisions:

- subjective probability of the loss
- size of the loss.

However, A. Pollatsek and A. Tversky proved that there is yet a third element, namely the size of the winning¹⁰.

Although the presented above review of approaches as regards risk analysis is rather superficial, it still proves the thesis that – due to the ambiguity of the investigation contexts where risk appears - a simple and explicit definition of the notion is not an easy task. However, the following features of risk can be presented: ¹¹

- risk is an objective category, i.e. it occurs irrespectively of human awareness;
- conscious risk becomes a key decision criterion in every area of human operation;
- when measured, risk is manageable

2. Risk in company operations

⁵ L. Osiatyński, *Problem kwantyfikacji ryzyka w handlu zagranicznym*, part I, „Wiadomości Ubezpieczeniowe”, No 1/1963, p. 1.

⁶ Ibidem, p. 2.

⁷ W. Grzybowski, *Ryzyko w procesie podejmowania decyzji*, Uniwersytet Marii Curie-Skłodowskiej, Lublin 1976, p. 25.

⁸ See: J. Koziński, R. Kietliński, *Podejmowanie decyzji w warunkach ryzyka związanego z działaniem podmiotu*, Warszawa 1972.

⁹ See: J. Koziński, T. Kotarbiński, *Traktat o dobrej robocie*, Ossolineum, Wrocław 1965.

¹⁰ A. Pollatsek, A. Tversky, *A theory of risk*, „Journal of Mathematical Psychology” 1970.

¹¹ Based on: A. Karmańska (scientific editor) *Ryzyko w rachunkowości*, Difin, Warszawa 2008, p. 61.

P.F.Drucker analyses risk through the theory of company management. He mentions four types of risk that basically exist in a company. They are:

- risk that has to be taken in order to continue operations;
- risk that is affordable– it is the loss of money and waste of efforts when looking for opportunities;
- risk that is not affordable – as the opposite of the affordable risk;
- risk that cannot be taken – it accompanies breakthrough moments when fundamental economic features and the potentials of a company undergo changes.¹²

According to P.F.Drucker, a company should focus on maximizing opportunities and not on minimizing the risk. Operations concentrated on risk avoidance result in the situation where companies take the biggest and the least justified risk – the risk of idleness. As P.F.Drucker states, if one starts looking for negative effects of operations, the arguments for idleness will always be found.

There are various types of risk in business. However, the classification of company risks is not simple as there are different types that change depending on the kind of operations (the risk is different in trade or manufacturing and differs from the one in financial entities). Moreover, some types of risk are distinguished on the basis of their source (e.g. credit risk, interest rate risk, etc.), while other types are classified on the basis of the effects they cause (e.g. the risk of losing good reputation or liquidity). One of the risk classification criteria is the division of risk with the consideration of company's ability to manage it. From this point of view, one can determine:

- active (internal) risk – related to company operations and manageable ;
- passive (external) risk – determined by external factors and cannot be managed by company.¹³

¹² Based on: P.F. Drucker, *Skuteczne zarządzanie*, PWN, Warszawa 1976, pp. 296-298.

¹³ K. Kiziuk, *Pomiar ryzyka przedsiębiorstwa. Modele pomiaru i ich ryzyko.*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2011, p. 22.

Table 1 presents basic types of active risk

Table 1. Types of company risks – division by risk sources

Types of company risks	I. Strategic risk	Structure of shareholders and capital connections	
		Profile of operations	
		Management system and organizational structure	
		Legal status and binding regulations	
		Other	
	II. Financial risk	Credit risk	
		Market risk	Interest rate risk
			Currency rate risk
			Commodity price change risk
			Other
	III. Operational risk	Organizational risk	Personnel risk
			Organization risk
			Other
		Technical risk	Quality risk
			Risk of technical means
			Risk of technical progress
			Other
IV. Model risk			

Source: Author's study based on K. Kiziuk, *Pomiar ryzyka przedsiębiorstwa. Modele pomiaru i ich ryzyko.*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2011, p. 23.

Strategic risk (I) influences company's competitive position in the long run. According to table 1 strategic risk is related to:

- the structure of its shareholders (especially to their awareness and commitment to company) and capital connections (which, for example, result in the possibility to gain means from other members of the group);
- the profile of operations – which means both the choice of the market sector and product range, as well as the target consumer group;
- the organizational structure and management system – which affect the operational risk in the future;

- the legal form and the subordination to particular regulations – which results in the range of asset liability and various information duties that affect operational, financial and business risks.¹⁴

Financial risk (II) distinguishes credit risk which is related to the possibility of failing to meet the terms of agreement by one of the parties and market risk that is caused mainly by the changes of prices on the market (or by a change of currency or interest rates). Operational risk (III) is the risk of loss, which results from improper management, wrong supervising and controlling structures or the errors on the part of decision makers. Model risk is related to the generation of loss caused by a theoretical model that is put into practice.¹⁵ The model is a certain approximation of reality, yet it should not be forgotten that model risk cannot be completely eliminated. The significance of model risk was pointed out by R.Merton” “ ... At times, the mathematics of the models become too interesting, and we lose sight of the models' ultimate purpose. The *mathematics* of the models are precise, but the *models* are not, being only approximations to the complex, real world. Their accuracy as a useful approximation to that world varies considerably across time and place. The practitioner should therefore apply the models only tentatively, assessing their limitations carefully in each application.”¹⁶

The presented above types of risk belong to active risk. Apart from that, companies are exposed to passive risk, i.e. the one that they have no influence on. Among passive risks one should mention:¹⁷

- political risk – resulting from the decisions of the authorities;
- risk of events – related to unexpected events that influence the situation of a particular entity;
- social risk – resulting from the behavior of consumers, their convictions, culture and religion;
- legal risk – is the consequence of the lack of appropriate rules, of changing rules and of the lack of certainty as regards their interpretation;
- risk of offense – risk of loss due to theft, violence, etc.;

¹⁴ Based on K. Kiziuk, *Pomiar ryzyka przedsiębiorstwa. Modele pomiaru i ich ryzyko.*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2011, pp. 23, 24.

¹⁵ Ibidem, p. 25.

¹⁶ R. Merton, *Influence of mathematical models in finance on practice*, Phil. Trans. Royal Society of London, 1994

¹⁷ Based on: K. Jajuga, *Miary ryzyka rynkowego - part one*, „Rynek Terminowy” No 6, 1999, pp. 67 – 69; R. Kendall, *Zarządzanie ryzykiem dla menedżerów. Praktyczne podejście do kontrolowania ryzyka.*, K.E. Liber, Warszawa 2000

- risk of financial system – which increases together with the increase of the mutual dependence between financial markets;
- risk of purchasing power – related to inflation;
- risk of market liquidity – occurs when closing the position on the market is impossible as the other party is non-existent;
- weather risk – occurs due to weather conditions (apart from natural disasters) and is particularly significant in agriculture or power industry;
- catastrophe risk – related to such events as natural disasters (e.g. hurricane, flood) or human action (e.g. a terrorist attack).

3. Risk management in a company

Risk management was first formalized in American plants at the turn of the 19th century. At first it referred to quality control and effective organization of production, aiming at the elimination of downtime in production. The Ford and DuPont companies were the forerunners in this respect. Simultaneously, insurance was used as a classical defense against risk. However, that method involved an increase of costs due to the rising premiums related to the wave of bankruptcies caused by the Great Crisis. Consequently, insurance costs were so high that ideas appeared to transfer the responsibility for risk back to companies.

Initially, instead of the term *risk management* other expressions were applied such as dealing with the risk, controlling the risk, protection against risk, etc. In 1997 P.L. Bernstein defined what should be understood by dealing with the risk. According to him, managing risk consists in maximizing the range of events whose effects - at least to some degree- can be predicted, and in minimizing the areas where cause and effect relationships are completely beyond our control and unknown to us¹⁸.

There are several methods that make a fairly precise measurement of risk possible. However, the methods were worked out for financial institutions, while non-financial institutions were treated marginally or simply neglected. It should be remembered that there are significant differences between risk management in financial and non-financial institutions. According to K.Jajuga, risk management in a financial institution means designing and implementing a time structure of cash flow with the aim to reach a desired risk level. The definition assumes that financial entities do not strive to eliminate risk but to reach

¹⁸ P.L. Bernstein, *Przeciw bogom. Niezwykłe dzieje ryzyka*, WIG-Press, Warszawa 1997, p. 174. (*Against the Gods. The Remarkable Story of Risk*)

a defined level of risk that ensures a determined money revenue. Financial institutions focus on the maximization of their financial instruments portfolio, while non-financial institutions emphasize the need to increase the value for the shareholders through the rise of the profit and cash flow. Other differences between risk management in financial and non-financial companies are given in the table below.

Table 2. Risk management in financial and non-financial institutions

Criterion	Financial entity	Non-financial entity
Value measurement	Value of financial instruments portfolio	Profits, cash flow
Time span	day, week	month, quarter, year
Direction of risk management	Mainly <i>bottom-up</i>	Mainly <i>top-down</i>

Source: Author's study based on : J.C. Stein, S.E. Usher, D. LaGattuta, J. Youngen, *A comparable approach to measuring Cash-flow-at-Risk for non-financial firms*, „Journal of Applied Corporate Finance” 13 (4), 2001, pp. 8-17 and K. Kiziuk, *Pomiar ryzyka przedsiębiorstwa. Modele pomiaru i ich ryzyko.*, Wyd. Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2011, p. 32.

In the last decade, one can observe on the part of companies a substantial interest in the issues of risk. It turns out that companies can be as efficient in risk management as banks. At present, the dominating trend is that risk management systems used by banks are introduced and adjusted to the needs of non-financial entities.

P.Borkowski points out to the fact that companies experience a significantly higher variety of risk types than banks. As a result, they need their own and individualized risk models. That makes things more difficult because the prevailing method of company management is not adapted to dealing with the risk due to the fact that it is only a slightly modified copy of the 19th century way of management when risk was local and not global in character.¹⁹ Thus, first of all the organizational structure of companies should be changed by introducing a unit that deals with risk.

Company risk management is undergoing a continuous change. J.Lam mentions the following effects as regards the progress in this respect. They are²⁰:

- in several companies units responsible for risk management have been transferred out of business operations and are independent as regards their controlling duties;

¹⁹ P. Borkowski, *Ryzyko w działalności przedsiębiorstw*, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2008, p. 15

²⁰ Based on: J. Lam, *Enterprise Risk Management: From Incentives to Controls*, John Wiley & Sons, New York 2003

- issues that previously belonged to the competences of accounting unit are within the responsibilities of financial managers;
- the range of services of accounting and risk management units has generally expanded;
- many companies strive not only for the elimination of risk but are also interested in maintaining it on a defined level in order to be able to benefit from the opportunities that result from taking it;
- many companies have defined principles and procedures of risk management.

Natomiast przewiduje się, że w najbliższym czasie nastąpią m.in. następujące zmiany w zakresie zarządzania ryzykiem:²¹

Moreover, it is predicted that - among others - the following changes in the field of risk management will occur:

- the role of the Board member responsible for risk management (Chief Risk Officer) will increase;
- the difference will increase between the remuneration of better and worse specialists in risk management;
- the work of risk management specialists will gain in significance;
- integrated risk management will become a standard in companies as shareholders will demand information on the existing types of risk;
- the integration of risk transfer will be conducted on company level (in the case of hedging it means that whole portfolios of financial instruments and not particular transactions will be secured);
- Value-at-Risk measurement method - due to its shortcomings- will be replaced by a different and more universal method that will take into consideration events that are seldom yet significant in consequences (VaR method does not consider them);
- a measuring standard of operational risk will be created;
- market-to-market accounting will expand and become more common, i.e. every transaction unclosed on a given day will be settled at the daily settlement price (every day the account will increase or decrease by an adequate amount).

²¹ J. Lam, *Enterprise Risk Management: From Incentives to Controls*, John Wiley & Sons, New York 2003

4. Reserves as the opportunity to secure against the effects of risk in the future

Reserves that are created in compliance with the principles of accounting should constitute a response to the effects of future risk. Thanks to the creation of reserves, which at the same time can be accounted as the costs of a given period, the financial result is lower and, consequently, the owners can pay a lower dividend. Thus, the reserves basically retain a part or the whole of the net profit in the company in order to finance further expansion. What is more, reserves secure the company against the expected liabilities such as costs or losses that may appear in the future as the effects of the operations of a current reporting period. Thus, reserves can be considered as an indication of a “cautious” financial policy of a company, and their creation may be treated as a way of company self-insurance against negative effects of risk related to future economic events. The creation of reserves is an important element of financial policy in every company. However, it is not an easy task. The problem is not only in the estimation of its value but also in the ability to predict future events and their effects.

The issues related to the principles of creating reserves are regulated in the Polish act on accounting and, additionally, in the KSR 6 (the National Accounting Standard No 6) of 14.10.2008 in *Reserves, accrued liabilities, contingent liabilities*. As regards international regulations concerning the issue of reserves, a separate document deals with the problem: MSR 37 (International Accounting Standard No 37): *Reserves, contingent liabilities and assets*.

According to the act on accounting, the liability is perceived as an obligation resulting from past events to make performances of a reliably fixed value which will make the entity use its currently owned or future assets²². The definition implies that the possibility of a reliable determination of the value and the probability to use the owned or future assets is the characteristic feature of liability. However, reserves are the liabilities whose due dates or the amount are not certain²³. Consequently, the lack of certainty as regards the due date or the amount is the criterion that makes it possible to differentiate reserves from liabilities.

In compliance with the act on accounting, reserves are created for:

²²art. 3 ust. 1 pkt 20, Ustawy z dnia 29.09.1994 r. o rachunkowości (Dz.U. z 2002 r. Nr 76, poz. 694 z późn. zm.)
Act on accounting of 29.09.1994, Art. 3, par 1, item 21 (Journal of Laws of 2002, No 76, item 694 as amended)

²³Act on accounting of 29.09.1994, Art. 3, par 1, item 21, op. cit.

- inevitable or highly probable future liabilities whose value can be estimated in a reliable way; particularly for the losses on economic transaction in progress, including the losses in respect of warranties, suretyships, credit operations and the effects of judicial proceedings in progress;
- future liabilities caused by restructuring, if the entity is obliged to conduct it on the basis of separate regulations or if adequate binding agreements were signed and the restructuring plans make it possible to estimate the value of future liabilities in a reliable way²⁴.

Such reserves are accounted as other operational costs, financial costs or extraordinary losses, adequately to the circumstances related to future liabilities.²⁵ Thus reserves can be created for future liabilities that are listed in the regulation and for other ones, which is implied by the open form: “ particularly”.

5. Scale of reserve creation in construction sector

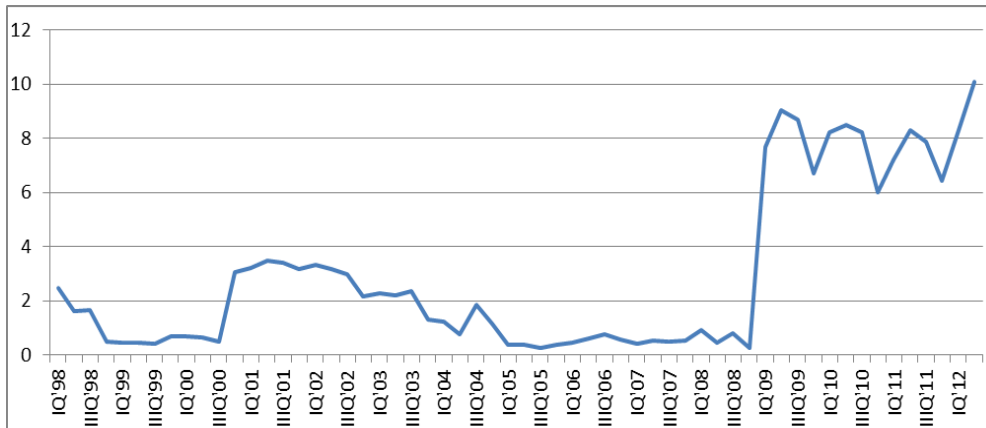
The aim of the investigation is to determine the degree of change in the amount of reserves in the course of several years and particularly during the latest financial crisis. Undoubtedly, the crisis resulted in the increase of the risk of operations and one should expect that economic entities would show a greater tendency to create reserves in order to self-insure against the effects of such a crisis. The analysis considered 25 companies that are included in the WIG-BUDOW Warsaw Stock Exchange index for companies in the construction sector. The sector was badly affected by the recent crisis and therefore the degree of reserves created should be significant. The data applied in the analysis were derived from the database of the Notoria Serwis SA company. They are quarterly and cover the period from the first quarter of 1998 to the second quarter of 2012.

The graph below presents the ratio of balance sheet reserve to the balance sheet total of the Budimex SA company. It is clear that the ratio of reserves increased significantly when crisis started. Obviously, their value fluctuated in particular quarters but it was never lower than 6%.

Graph 1. Ratio of reserves to balance sheet total in the Budimex SA company in 1998-2012 (in %)

²⁴Act on accounting, Art. 35d, par 1, op. cit.

²⁵Act on accounting, Art. 35d, par 1, op. cit.

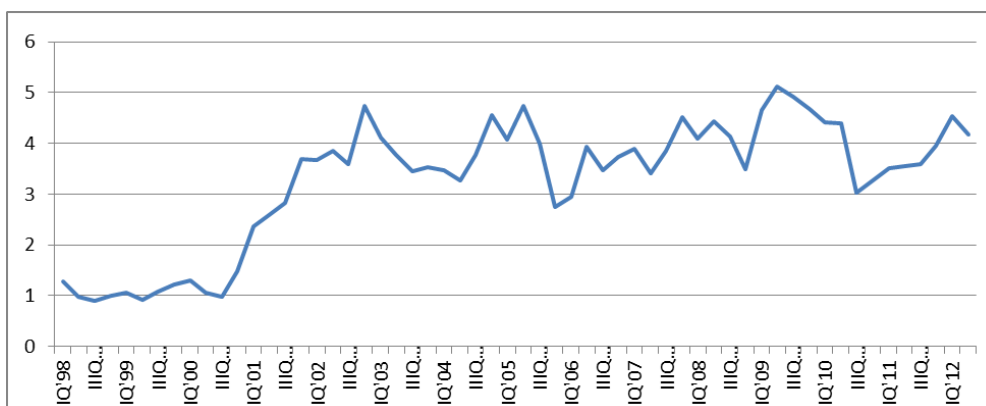


Source: Author's investigation

However, such tendency cannot be observed when the ratio of the average value of reserves to the balance sheet total of the companies under investigation was analyzed. At first, the ratio of the reserves was very low, around 1%. In time, its value increased when the regulations on accounting were amended. An insignificant rise of the ratio appeared in the first and second quarter of 2009. The highest level was reached in the second quarter of 2019, when it amounted to 5.12%. A year later it went down to the level of 3%.

It should be mentioned that graph 2 presents the average value of the ratio of reserves to the balance sheet total calculated only for the companies that created reserves in this time. Companies that did not create the reserve were not taken into consideration.

Graph 2. Average ratio of reserves to balance sheet total for companies included in the WIG-BUDOW index in 1998-2012 (%)

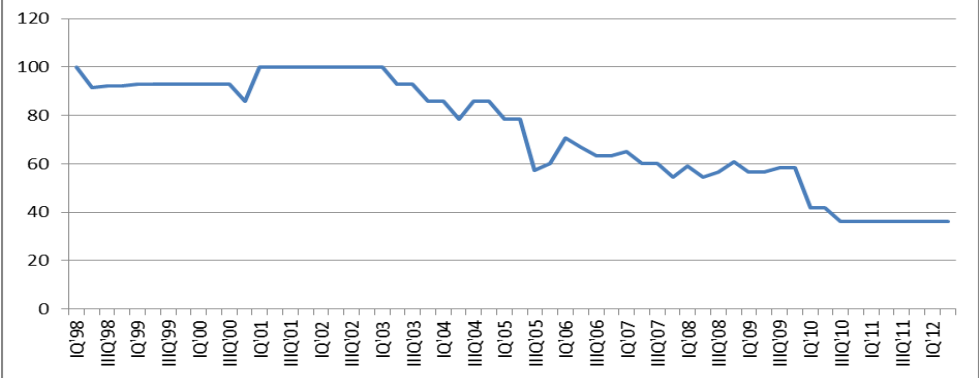


Source: Author's investigation

A more detailed analysis of the data may lead to the conclusion that some of the companies stopped creating reserves at all. The graph below shows the ratio of companies

from the group of the 25 entities under investigation that create reserves. It shows clearly, that in the first period all companies created reserves, and in this case their value is of no significance. Since the second quarter of 2003 the number of companies creating reserves dropped gradually to the level of 36%. Even the crisis did not result in the reverse of the trend.

Graph 3. Percentage of companies creating balance sheet reserve



Source: Author's investigation

After the analysis of the companies included in the WIG-BUDOW index, it can be stated that particular companies create reserves and treat them as a method of reacting against negative effects of the risk related to the latest crisis. Budimex SA is one of them. However, the average ratio of reserves to the balance sheet total does not indicate a significant growth that would accompany the symptoms of the approaching crisis. Moreover, surprisingly enough, an increasing number of companies stopped creating reserves. Probably, this is due to the fact that reserves are accounted as costs and, consequently they decrease the value of the financial result. The crisis resulted in company problems with profitability and the reserves would have only worsened the figures.

Conclusion

Risk is an inherent element of the operations of any economic entity. In the last years risk management has been undergoing several changes. New concepts and instruments have appeared to ensure efficient risk management. Accounting also provides a tool that should help reduce the results of risk in a company. It is the reserves that are created to meet future risk. In the research, financial reports were analyzed of 25 companies listed on the Warsaw Stock Exchange and included in the WIG-BUDOW index. It turned out, unexpectedly, that

during the crisis the companies did not increase their reserve levels in relation to the balance sheet total. What is more, some of the companies under investigation ceased creating reserves. That might have been caused by the fact that reserves are accounted as costs and consequently decrease company financial results. Possibly, although it is rather improbable, they apply other, more advanced methods of risk management and do not see a further need to limit the effects of future risk.

Bibliography

- [1] Bernstein P.L., *Przeciw bogom. Niezwykłe dzieje ryzyka*, WIG-Press, Warszawa 1997.
- [2] Borkowski P., *Ryzyko w działalności przedsiębiorstw*, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2008.
- [3] Bruhwiler B., *Risk Management – eine Aufgabe der Unternehmensführung*. Verlag Paul Haupt, Bern, Stuttgart 1980.
- [4] Drucker P.F., *Skuteczne zarządzanie*, PWN, Warszawa 1976.
- [5] Grzybowski W., *Ryzyko w procesie podejmowania decyzji*, Uniwersytet Marii Curie-Skłodowskiej, Lublin 1976.
- [6] Jajuga K., *Miary ryzyka rynkowego - part one*, „Rynek Terminowy” No 6, 1999.
- [7] Jędralska K., *Zachowania przedsiębiorstw w sytuacjach niepewnych i ryzykownych*, AE w Katowicach, 1992.
- [8] Karmańska A. (scientific editor), *Ryzyko w rachunkowości*, Difin, Warszawa 2008.
- [9] Kendall R., *Zarządzanie ryzykiem dla menedżerów. Praktyczne podejście do kontrolowania ryzyka.*, K.E. Liber, Warszawa 2000.
- [10] Kiziuk K., *Pomiar ryzyka przedsiębiorstwa. Modele pomiaru i ich ryzyko.*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2011.
- [11] Koziński J., Kietliński R., *Podejmowanie decyzji w warunkach ryzyka związanego z działaniem podmiotu*, Warszawa 1972.
- [12] Koziński J., Kotarbiński T., *Traktat o dobrej robocie*, Ossolineum, Wrocław 1965.
- [13] Lam J., *Enterprise Risk Management: From Incentives to Controls*, John Wiley & Sons, New York 2003.
- [14] Merton R., *Influence of mathematical models in finance on practice*, Phil. Trans. Royal Society of London, 1994.

- [15] Nahotko S., *Ryzyko ekonomiczne w działalności gospodarczej*, Zeszyt 201, OPO, Bydgoszcz 2001.
- [16] Orłowicz F., *Ryzyko gospodarcze a prawo karne*, „Nowe prawo”, No 3/1968
- [17] Osiatyński L., *Problem kwantyfikacji ryzyk w handlu zagranicznym*, part I, „Wiadomości Ubezpieczeniowe”, No 1/1963.
- [18] Philipp F., *Risiko und Risikopolitik*, C.E. Poeschel Verlag, Stuttgart 1967.
- [19] Pollatsek A., Tversky A., *A theory of risk*, „Journal of Mathematical Psychology” 1970.
- [20] Stein J.C., Usher S.E, LaGattuta D., Youngen J., *A comparable approach to measuring Cash-flow-at-Risk for non-financial firms*, „Journal of Applied Corporate Finance” 13 (4), 2001.
- [21] Ustawa z dnia 29.09.1994 r. o rachunkowości, (Act on accounting of 29/09/1994) Dz. U. z 2002 r. Nr 76, poz. 694 (Journal of Laws of 2002, No 76, item 694) as amended

Abstract

The article discusses selected issues related to company risk. It points out that the method of reducing the negative impact of risk in accounting is to create reserves. Finally, analysis of selected companies is conducted with the aim to check to what extent the companies create reserves.