Financial Risk Identification based on the Balance Sheet Information

Joanna Błach

Abstract
The exposure to risk in modern economy is constantly growing. All enterprises have to take up different types of risks. This paper is devoted to financial risk - its definition, components, factors and consequences and the way it can be identified and analyzed by the usage of information provided by the balance sheet. The advantages and limitations of this method of financial risk assessment are also presented. The potential of identifying financial risk based on the balance sheet information is illustrated on the example of aggregated data for 100 biggest Polish companies for 10 years period (2000-2009).

Key words
Financial risk, financial analysis, risk assessment, balance sheet.

1. Introduction
Modern society is often described as “the society of risk”, which means that the social production of wealth is accompanied by the social production of risk [5, p.59]. Therefore, enterprises operating in such environment, are forced to take up different types of risk, in order to develop themselves and increase their effectiveness. Thus their exposure to risk is constantly growing.

There is a huge variety of corporate risks that are analyzed and classified taking into account different types of criteria. One of the most important types of corporate risk is financial risk.

2. Defining financial risk and its components
There is no unified definition of financial risk in the literature. But the problem begins with the general definition of risk.

In the theory there are presented two conceptions of risk definition. The first one - the negative conception describes risk as a threat of potential loss. The second one – the neutral conception suggests that risk is not only a threat but also an opportunity, so the risk means the possibility of obtaining results different than expected [3, p.150].

Thus the definition of risk depends mainly on the approach towards risk and it may result in different actions taken up by the managers. In case of the negative approach, the main aim of the managers will be to minimize the potential loss and try to avoid risky actions, in order to stabilize the situation of the company. In the second situation, the managers will not only try to minimize the loss, but also try to take advantage of the undertaken risk and improve the

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situation of the company. Thus financial risk, as any type of risk, can be analyzed from neutral or negative perspective.

In the theory of finance, one can also find different meaning of financial risk.

In narrow meaning the financial risk is described as the additional risk borne by the shareholders due to the substitution of debt for common stock [10, p.G-10]. Thus, in this meaning, financial risk is an equivalent to the capital structure risk.

In broad meaning, the financial risk is defined as any fluctuation in the cash flows, financial results and the company's value due to the influence of different types of factors; mainly market ones, such as: interest rates, exchange rates, commodity and stock prices. So, according to this definition financial risk is responsible for any changes in the financial condition of the company.

In this paper the narrow definition of the financial risk is applied, with one modification - two additional components are included in the financial risk besides the capital structure risk – liquidity risk and insolvency risk (or long-term stability risk) which are connected with the financing decisions of the company. Therefore financial risk analyzed in this paper would be equal to the financing risk including three components:

1. capital structure risk arising by using debt capital to finance part of the company’s assets;
2. liquidity risk connected with the ability of the company to pay its short term liabilities by using assets that can be quickly converted into cash (current assets);
3. long-term stability risk connected with the sources of finance used to buy long-term assets (fixed assets) and long-term insolvency risk.

It is worth mentioning that financial risk in presented meaning is only one part of the overall corporate risk. There are many others types of risk which should be taken into account while preparing an integrated approach to risk management process in the company.

Despite different approaches to risk definition, modern companies must be aware of their exposure to risk and should take up actions in a form of planned risk management process aiming at acceptable level of risk. This process includes three stages: analysis, manipulation and monitoring of risk [see more about risk management process: 13, pp.12-15, 9, pp.44-55].

Risk management process starts with risk analysis, which enables the company to identify different types of risk, to recognize risk factors and to evaluate the potential consequences of risk by measuring risk exposure. Next stage - risk manipulation - includes different scenarios of actions that are prepared for each type of risk. The company can use variety of risk management tools, both traditional (e.g. insurance) and modern ones (e.g. derivatives), that should be tailored to company's unique situation and needs. Taken actions should be continuously monitored and controlled to check up their results, compare them to the plan and introduce modification if it is required. Risk monitoring enables the company to forecast the level of risk and prepare the company's actions in future. Thus, the risk assessment is a continuous process that is an important part of the risk management, and is realized at the first and the third stage – risk analysis and monitoring of risk.

There are many risk assessment methods – one of them is financial analysis, that can be used both at the stage of risk analysis and risk monitoring. Financial analysis is a financial management tool that uses different sources of information concerning company’s past and current activities as well as its present and future financial situation. The most important sources of information used in the financial analysis are financial statements provided by the accounting system, translating a company's diverse activities into a set of objective numbers that inform about the company's performance, problems and prospects [6, p.3]. Financial data included in the financial statements can be used to identify the types of risk and their factors,
to recognize the reasons and consequences of the corporate risk, to analyze the results of risk management tools and to forecast the level of risk in future.

It is worth mentioning that analysis of the financial risk can be prepared for internal purposes of the company and also for the external parties – that is any stakeholders that are interested in assessing the financial situation of the company (current and future) – these are mainly shareholders and potential investors, including creditors thinking about providing capital to the company. Risk analysis for this group of the statement users is a little bit different than for company's internal purposes – as they are interested in the overall company's risk to estimate risk premium included in the expected rate of return on investment made in the company.

3. Using balance sheet information to assess the financial risk

The first element of the financial statement is the balance sheet presenting the company's financial position at a single point of time, including company's assets and the liability and equity claims against those assets [see more about balance sheet elements and its construction in:12, pp.14-18, 4, pp.128-136, 1, pp.20-24]. Basic elements of the balance sheet are presented in table 1.

<table>
<thead>
<tr>
<th>Assets</th>
<th>Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed assets:</td>
<td>Equity capital:</td>
</tr>
<tr>
<td>1. Intangible assets</td>
<td>1. Common stock</td>
</tr>
<tr>
<td>2. Net plant and equipment</td>
<td>2. Additional paid-in capital</td>
</tr>
<tr>
<td>3. Long-term accounts receivable</td>
<td>3. Retained profit</td>
</tr>
<tr>
<td>4. Long-term investment</td>
<td></td>
</tr>
<tr>
<td>Current assets:</td>
<td>Debt capital:</td>
</tr>
<tr>
<td>1. Inventory</td>
<td>1. Long-term debt capital</td>
</tr>
<tr>
<td>2. Accounts receivable</td>
<td>2. Current liabilities</td>
</tr>
<tr>
<td>3. Short-term investment</td>
<td></td>
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</tbody>
</table>

Table 1: General model of a balance sheet

By using balance sheet information the three components of the financial risk can be identified and analyzed: capital structure risk, liquidity risk and insolvency risk (figure 1).

To analyze the capital structure risk one should calculate the D/E ratio (debt-to-equity ratio) comparing debt to equity capital used by the company to finance its assets\(^2\). D/E ratio is one of the most important indebtedness ratios showing the financial leverage used by the company. The higher this ratio is, the higher financial risk connected with using debt capital by the company. The optimal value for this ratio is described as 1 till 3 – in this situation the company can use all the advantages of the debt capital (mainly tax shield) without too high risk of financial distress. Obviously, presented standard results from theoretical studies, in real world each company should look for its optimal value taking into account its characteristics and unique situation – this problem is connected with searching for the optimal capital structure\(^3\).

\(^2\) D/E ratio can be calculated by using book or market values. Balance sheet provides information on book values of equity and debt capital.

\(^3\) Optimal capital structure is defined as the optimal financing mix (debt and equity capital) that minimizes company’s weighted average cost of capital (WACC) and simultaneously maximizes its value [1, pp.388-389].
When more detailed information on capital structure is needed there can be calculated additional ratios, such as:

- debt to assets ratio (D/A) showing the part of the company's assets financed by debt capital;
- equity to assets ratio showing part of the assets that belongs to the shareholders;
- retained profit to assets ratio showing part of the assets financed by the internal equity capital generated by the company itself, thus showing its independence from external sources of finance;
- long-term debt capital to assets – showing part of the assets financed by long-term debt capital;
- long-term debt capital to equity – showing the level of financial leverage taking into account only long-term debt;
- interest-bearing liabilities to equity – showing the level of financial leverage taking into account only debt capital which usage is connected with interest payments;
- long-term debt capital to total debt showing the structure of the company’s liabilities.

More detailed ratios describing company’s capital structure can be constructed when needed.

The second element of the financial risk analysis is connected with liquidity. The basic analysis of the company’s liquidity risk can be conducted by the usage of liquidity ratios based on the balance sheet information. There are three basic liquidity ratios: current, quick and cash ratio.

Current ratio equals to current assets divided by current liabilities and indicates the amount of current assets available to meet all of the maturing obligations listed under current liabilities. The optimal value for this ratio is between 1,5-2,0 - this means that below 1,5 the company may have problems with paying its current obligations on time, and in the opposite situation, when it is higher than 2,0 - this may lead to lower efficiency due to excess cash balances, slow paying receivables or obsolete inventory (over liquidity).

Second liquidity ratio is more conservative as it takes into account current assets excluding inventory as the least liquid part of them. The general standard for quick ratio is 1 to 1 between current assets without inventory and current liabilities. The interpretation of the quick

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4 D/E ratio can be calculated by the usage of different formulas according to the type of the capital structure definition. Therea are several approaches to this problem:
- in broad definition capital structure is equal to sources of finance used to purchase company's assets – that is a financing structure [8, p.1],
- in narrow definition capital structure includes equity capital + long-term debt capital excluding current liabilities, so it is equal to fixed capital [14, p. 565],
- in popular definition capital structure is equal to equity capital + interest bearing liabilities excluding liabilities without interest payment, in this approach capital structure is equal to the total capital employed [6, p.53],
- capital structure can be also defined as capital obtained only by issuing financial instruments – shares and bonds, excluding sources of finance that are not connected with the capital market (such as bank loans) [7, p.435].

5 The analysis of the capital structure risk can be improved by using information from the second element of the financial statement – the income statement. Data included in it can be used to analyze the coverage ratios showing the company’s ability to cover interest payments from its earnings – mainly operating profit (EBIT). It can be useful also to calculate the Degree of Financial Leverage (DFL) showing the fluctuation of the earnings per share (EPS) caused by the changes in the earnings before interest and taxes (EBIT) due to the interest charges [see more about debt analysis in: 4, pp.584-594, 1, pp.52-55, 2, pp.113-118].
ratio is similar to the current ratio; higher value means lower liquidity risk; however it may be a signal of lower effectiveness. Similar information is provided by the cash ratio, in which cash is divided by current liabilities. As these ratios are calculated by the usage of balance sheet information, their results are static, and the data are valid only for the balance sheet day. To analyze the dynamic changes in the liquidity risk, the managers can use the cash flow statement and the cash sufficiency ratios (cash coverage ratios)\(^6\).

In addition to liquidity ratios, in order to assess the liquidity risk of the company, the level of net working capital can be calculated and analyzed. Net working capital is defined as part of the company's current assets financed by the fixed capital\(^7\) and it can be calculated as the difference between current assets and current liabilities. Net working capital can be compared to total assets indicating the percentage of assets that a company carries as net working capital. The main role of the net working capital in the company is the additional liquidity reserve and it is considered as one of the most important aspects of the company’s strength. The higher level of net working capital, the lower liquidity risk due to a stronger liquidity condition, however the problem of the company’s efficiency should be taken into consideration as well, as higher level of net working capital is connected with higher cost of capital. So after some point, further increase in net working capital becomes ineffective [see more about liquidity analysis: 1, pp.47-52, 4, pp.733-736, 2, pp.108].

The third element of the financial risk assessment is connected with long-term stability and financial balance of the company. It is recognized that the company keeps financial balance, if its long-term assets are financed by long-term sources of finance, and short-term assets by short-term sources of funds. Otherwise, company looses its financial balance, which may lead to financial instability and problems with long-term solvency of the company that may result in bankruptcy.

To analyze the financial balance of the company, two golden rules can be used. According to the first rule (I), fixed assets should be covered by equity capital; only in this situation the financial balance is maintained. Second rule (II) is less restrictive, as according to it, fixed assets may be financed by fixed capital including equity capital together with long-term debt capital\(^8\). If at least, the second golden rule (II) is maintained, the company keeps financial balance and its insolvency risk is very low. Otherwise the risk of potential bankruptcy is significant [see more about golden rules: 11, pp.68-69].

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\(^6\) Cash sufficiency ratios provide information about the ability of the company to cover all its cash expenses (in the form of cash outflows connected with financing and investing activities) from its operating cash flow (cash generated in its operating activity).

\(^7\) Fixed capital = equity capital + long-term debt capital

\(^8\) To analyze golden rules one can use following formulas:

(I) golden rule = equity capital / fixed assets = E/FA
(II) golden rule = fixed capital / fixed assets = FC/FA
Summarizing, balance sheet information can be used to identify and assess three components of the financial risk showing its extent, reasons and potential consequences (figure 1). However, potential problems and limitations of the financial analysis should be taken into account while using this risk assessment method. One of these problems is connected with the time lag between the day on which the financial statements are published and the balance day – in times of high market volatility information presented in the financial statements can be invalid. This may lead to pitfalls in forecasting future operating performance and financial condition based on past trends. Another problem results from the financial statement risk, arising from different methods and techniques of accounting that can be used by the company in order to improve its situation presented in the financial statements and show it as better than it in reality is (“window dressing technique”). Other areas of concern are connected with the selection of the appropriate benchmark for comparison purposes and the proper interpretation of the ratios [see more about these limitations in: 12, pp.70-71, 4, pp.748-750, 1, pp. 70-71].

4. Financial risk assessment – an empirical study

To illustrate the potential of the financial risk identification based on the balance sheet information, basic empirical study was conducted. The group of 100 biggest Polish companies was analyzed focusing on changes in their balance sheet elements to find out the changes in their exposure to financial risk. These companies represent all sectors and industries excluding financial institution such as: banks, insurance companies, trust funds and investment companies. All companies are listed on the stock exchange and they were ranged according to their turnover. The analyzed period consists in 10 years, from 2000 till 2009, so the changes in the market condition and overall economy situation may have influence on the financial situation of the analyzed companies.
The first part of the research covers the analysis of the changes in the value of assets, equity and debt capital (figure 2).

**Figure 2:** Assets, equity and debt capital of the analyzed companies in 2000-2009 (in mln EUR)

All three elements: assets, equity and debt capital were fluctuating during the analyzed period, however, in 2000-2007 an upward trend can be observed, and then decreasing tendency in 2008-2009 caused by the financial crisis. In 2000 the value of total assets for all 100 companies was almost 25 000 mln EUR, then going up rapidly and reaching more than 81 000 mln EUR in 2007 and with the slight decrease in 2008, to more than 68 000 mln EUR in 2009. The overall increase in the value of assets was more than 170%, which means that despite the fluctuations and changing market conditions the companies are developing, realizing investment projects, resulting in the higher value of assets.

Similar dynamic changes can be observed while analyzing the value of equity and debt capital. Equity capital in 2000 was more than 10 000 mln EUR, with dynamic increase in 2003-2007, reaching the highest value more than 42 000 mln EUR at the end of 2007 and then decreasing to 38 000 mln EUR in 2009. Total increase in the equity capital was more than 280%.

At the beginning of the analyzed period the value of the debt capital was almost 15 000 mln EUR, in 2007 the highest value was almost 39 000 mln EUR and after the decrease reached the value of more than 29 000 mln EUR. The dynamic index for the whole period for debt capital is almost equal to 100%.

It is worth mentioning that the first changes in the capital structure also can be observed. In the first period - 2000-2003 debt capital was higher than equity, and in the next period the capital structure became safer as equity capital is higher than debt. These changes result from higher dynamic indexes in case of equity capital than in case of debt.

Next part of the research is devoted to the problem of capital structure changes identified by D/E and D/A ratios, together with the changes in the average profitability of equity capital measured by return on equity ratio (ROE)\(^9\) (figure 3).

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9 Return on equity = net profit / equity capital.
Values of D/E and D/A ratios were fluctuating in the analyzed period, however significant changes in the capital structure can be observed. The highest value of D/E ratio was in 2001 when it was higher than 153%. In 2000-2003 D/E was higher than 100%, which means that the capital structure was highly geared with significant financial risk, however not too dangerous. Since 2004 D/E is lower than 100%, with the minimum value in 2008 equal to 72%. These changes inform that the analyzed companies decided to use more equity capital than debt, so their capital structure becomes more safe and stable. One should here pose the question – what is the reason of such decisions? The answers can be diversified, as each of the company may have other motives for such changes - to list only the most probable ones: difficult access and high cost of debt capital, availability of the equity capital including internal sources in the form of retained profit, negative consequences of the financial leverage in the form of bankruptcy costs.

The analysis of the second ratio – D/A provides similar information – in 2000-2003 more than 50% of the companies’ assets were financed by debt capital, since 2004 the situation has changed – from 42% (2008) till 48% (2007) of assets were covered by liabilities.

Interesting conclusion can be made by analyzing changes in the capital structure together with the changes in the average ROE ratio. It is recognized that one of the motif of using debt capital is to receive the positive effect of the financial leverage, which is described as the increase in the return on equity due to the usage of debt capital. If it was true in case of the analyzed companies, the highest return on equity should be observed at highest D/E or D/A value. However in this case, at the highest D/E equal to 153% in 2001, ROE was at the minimum level equal to 3,2%. The highest profitability of equity capital was observed in 2005 – 28,1%, when D/E was equal to 76%. This observation can lead to the conclusion, that probably the analyzed companies may not have the possibility to use the positive effects of the financial leverage due to high interest payments, and may be that was the reason for decreasing level of debt in the capital structure. Obviously other factors may have influence on companies’ profitability, to list only a few – the effectiveness of the investment projects, the profitability of the operating activity or the overall economic conditions. But for detailed profitability analysis more information is needed.
Next element of this analysis is liquidity risk. Average values of current ratio and net working capital together with ratio representing the second golden rule (FC/FA) for the analyzed group of companies are presented on figure 4.

Figure 4: Current ratio, net working capital and financial balance of the analyzed companies in 2000-2009

In 2000-2003 the value of current ratio was below 1,00 and the net working capital was negative (below zero) which means that the liquidity risk was very high and the ability of the companies’ to pay all the current liabilities on time was very poor. Since 2004 the situation has been improved, as current ratio is higher than 1,00 and the net working capital is positive. However the best situation can be observed in 2005 – current ratio at the maximum level 1,6 and in 2009 – current ratio almost 1,6 and the maximum value of the net working capital more than 8 000 mln EUR. Concluding, in the analyzed period the liquidity risk is decreasing, but still there is no risk of over liquidity. These data may indicate further changes in the capital structure – as these companies are using less short-term liabilities to finance their current assets. Once again similar question should be posed – what is the reason of these changes – as current liabilities are known to be the cheapest way of financing. Whether the problem of low liquidity was the reason for this decrease in short-term liabilities and the decision was made internally by the companies, or it was imposed on them externally? Were managers aware of the potential threats connected with low liquidity and decided to improve the situation or may be the potential creditors assess the companies as very risky and decided to limit their access to short-term financing? Obviously, the answer can be different in case of each company.

Changes in the net working capital are connected with changes in the liquidity level but they are also important for the last element of the presented analysis – insolvency risk highlighted by the financial balance analysis. Changes in FC/FA ratio comparing fixed capital to fixed assets are also presented on the figure 4. In 2000-2003 there were more fixed assets than fixed capital which means that part of the fixed assets had to be financed by the short-term liabilities (net working capital was negative), so the situation was very difficult due to very high liquidity risk, lack of financial balance and quite significant insolvency risk. Since 2004 the financial balance is maintained, as long-term assets are financed by long-term sources of capital and the net working capital is positive. The analyzed companies have long-term stability with additional liquidity reserve, which guarantees health and stable fundamentals of their activity.

Summarizing, the analyzed period can be divided into two parts – the first one - 2000-2003 and the second one - 2004-2009. The situation of the analyzed companies in the first period
can be characterized as quite risky with significant level of financial leverage, liquidity risk and lack of financial balance. In the second period the situation has been improved – as the capital structure is safer, liquidity risk has decreased and the companies have obtained long-term stability.

5. Conclusion

Presented analysis illustrates the potential of identifying financial risk of the company by the usage of the balance sheet information. Obviously this analysis should be treated as introduction to more detailed analysis, but the main problems and threats can be identified. Received conclusion can be used as a basis for financial planning and financial risk forecasting. However, to obtain the overall picture of the company's health, other parts of the financial statements and additional information from the accounting system and outside the company together with more complex method of risk assessment should be used.

Reference


Summary

Financial risk defined as the risk connected with the company’s financing decisions is one of the most important determinants of company’s condition. In this paper three components of the financial risk were briefly analyzed – capital structure risk, liquidity risk and insolvency risk. Financial risk identification based on the balance sheet information was presented – the most important ratios were described and interpreted, basic principles together with significant limitations were indicated. The theoretical aspects of this risk assessment method were supported by the example showing its empirical application.