



Financial Analysis and Bankruptcy Risk Identification Model Used by Companies Operating in Poland – Empirical Study Results

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DOI: 10.26417/wc9xbd78

Abstract

Financial analysis and bankruptcy risk assessment models serve as indispensable tools for comprehensively evaluating a company's economic position and proactively identifying systemic threats to ongoing business activities. These quantitative assessments are traditionally conducted using standardized data extracted from corporate financial statements, which in Poland may be legally prepared in accordance with either domestic accounting regulations or International Financial Reporting Standards (IFRS). In the Polish economic landscape, bankruptcy risk identification models—which leverage both historical metrics and prospective forecasting data to calculate the mathematical probability of corporate insolvency—first began to emerge a few years following the pivotal socio-political and market transformations of 1989. Today, the academic and professional literature describes over 15 distinct, locally developed forecasting models, each featuring unique variables tailored by different authors to map distress. The primary objective of this article is to present the empirical findings of a comprehensive survey study investigating the practical application of these financial analysis and bankruptcy identification tools among the largest companies operating within Poland. The empirical results robustly demonstrate that large Polish enterprises actively deploy these analytical tools not only to evaluate their own internal economic health, but also to audit the financial stability of their direct competitors and key business partners. Furthermore, the findings reveal a distinct operational preference for utilizing bankruptcy risk assessment models that were explicitly developed according to and calibrated for the unique macroeconomic circumstances and structural nuances of the Polish market.

Keywords: financial analysis, bankruptcy risk identification models, financial statements, survey study,

1. Introduction

Changes in the capital structure and the passing of risk constitute reasons of conflicts between shareholders and other stakeholders (Swanson, Srinidhi, Seetharaman, 2003). One can imagine a situation, in which shareholders strive to increase the value of assets and thus influence the increase of unpredictability of company's future position (Nowak, 2013). For every entity the building of company values is inherently related to capital structure, and relationships between the two have been the subject of interest of and studies conducted by many scientists. Such studies were already carried out in 1960s by F. Modigliani, M. H. Miller (Modigliani, Miller, 1958).

Nowadays, in the Polish economic reality one can often see attempts to apply synthetic measures to predict financial problems. The majority of those attempts are directed at the use of Z-score models prepared and presented in western countries. Such an approach, however, has limited application as those models have been developed in different economic circumstances (Holda, Micherda, 2007). Models of financial risk assessment developed in one country cannot be applied to another country due to differences in (Prusak, 2005):

- economies of specific countries,
- applicable accounting standards,
- access to information.

Similarly to other countries, in Poland there are models based on discriminant function which are useful to assess solvency as well as bankruptcy risk. One of the first Polish models was developed by E. Maczynska (Maczynska, 1994). Currently, there are more than 15 models used in Poland which have been developed by different authors.

To assess financial risks of Polish companies, ratio analysis is applied, and one of the first Polish studies in that respect was conducted by D. Wedzki in 1997 (Wędzki 1997).

What is more, the assessment of company's bankruptcy risk is a process, the objective of which is to determine a probability of such an event in the future on the basis of historical and prospective data (Dorozik, 2006). The primary source of such data is a financial statement.

The principles of preparing general purpose financial statements in Poland are stipulated in the Polish Accounting Act of 29 September 1994, with further amendments (*The Accounting Act of 29 September 1994*). It should be indicated, however, that since 2005 capital groups listed on the Warsaw Stock Exchange must

prepare their financial statements in accordance with IAS/IFRS (IFRS, 2014), which is related to the implementation of Regulation (EC) No 1606/2002 of the European Parliament and of the Council on the application of international accounting standards to the domestic regulations. A comparison of domestic and international legal regulations for reporting shows that the structure of financial statements as well as the scope of data and revaluation method are not identical and thus provide information of different quality. Nevertheless, financial statements prepared in accordance with both the Accounting Act and IAS/IFRS constitute the primary source of information used for financial analysis and bankruptcy risk assessment.

The aim of this article is to present the results of an empirical study on the use of financial analysis and bankruptcy risk identification models by the largest companies in Poland. It should be noted that the study conducted by the authors is the first study of this sort carried out in Poland.

2. Description and methodology of the study

The largest companies in Poland were invited to participate in the study, and the sampling was purposive, not random. There were 120 entities participating in the study, eighty of which were the companies listed on the Warsaw Stock Exchange which composed two major indices, i. e. WIG-30¹ and WIG-50². The remaining 40 companies were selected from a list of the largest Polish companies indicated in a summary list entitled *Lista 500*, prepared by the Polish weekly magazine *Polityka* in 2014. The first 40 companies listed in the summary which were not stock-listed were selected for the study.

The study was conducted from 10 May 2014 to 20 June 2014 by means of a mail survey. The survey questionnaire which was prepared and then sent out to the respondents consisted of two parts:

- the first part, the so called particulars, included first eight questions regarding basic information on respondents, such as type of business activity, employment rate or capital structure;
- the second part included next nine questions on financial analysis and methods of bankruptcy risk assessment as well as their application by the studied entities.

Questions in the questionnaire were closed-ended and open-ended. Some of them required only *yes* or *no* answer; however, in most cases respondents were asked to select one answer or more from those available. If applicable and justified, respondents could express their own opinions. Statistical methods, especially structure ratio, were applied for the analysis of result.

¹ WIG-30 – index of thirty largest companies on the Warsaw Stock Exchange. The constituents are selected based on two criteria: capitalization and turnover.

² WIG-50 – index of further fifty largest companies on the Warsaw Stock Exchange, following the 30 companies composing WIG-30.

3. Description of sample

Survey questionnaires were sent to 120 selected companies, thirty four of which returned completed questionnaires, which constituted the response rate of 27, 5%. Seven questionnaires (20, 6%) were received from companies from WIG-30 index, fifteen (44, 1%) from companies from WIG-50 index, and twelve (35, 3%) from non-public companies listed in the summary of the largest Polish companies, *Lista 500*.

The decisive majority of the companies which returned completed questionnaires were capital groups (67, 6%) which prepare consolidated financial statements (67, 6%) and which are listed on the stock exchange (64, 7%). There was also an insignificant dominance of companies with solely Polish capital (58, 8%), employing over 250 people (55, 9%) and conducting production (52, 9%) or (50, 0%) trading activities. Questions were mainly answered by chief accountants or financial directors. Specific characteristics of companies participating in the study are presented in Table 1.

Table 1. Description of the sample

Characteristic		N	%	Characteristic		N	%
Activity*	Production	18	52, 94	Stock exchange	Listed	22	64, 71
	Trade	14	41, 18		not listed	12	35, 29
	Services	17	50, 00	Capital	solely Polish	14	41, 18
Capital group	yes	23	67, 65		with foreign capital	20	58, 82
	no	11	32, 35	Employment	up to 250 people	15	44, 12
Financial statements	Separate	23	67, 65		more than 250 people	19	55, 88
	Consolidated	11	32, 35	Sales revenue	up to 250 million PLN	14	41, 18
* more than one answer possible					more than 250 million PLN	20	58, 82

Source: author's compilation based on survey results

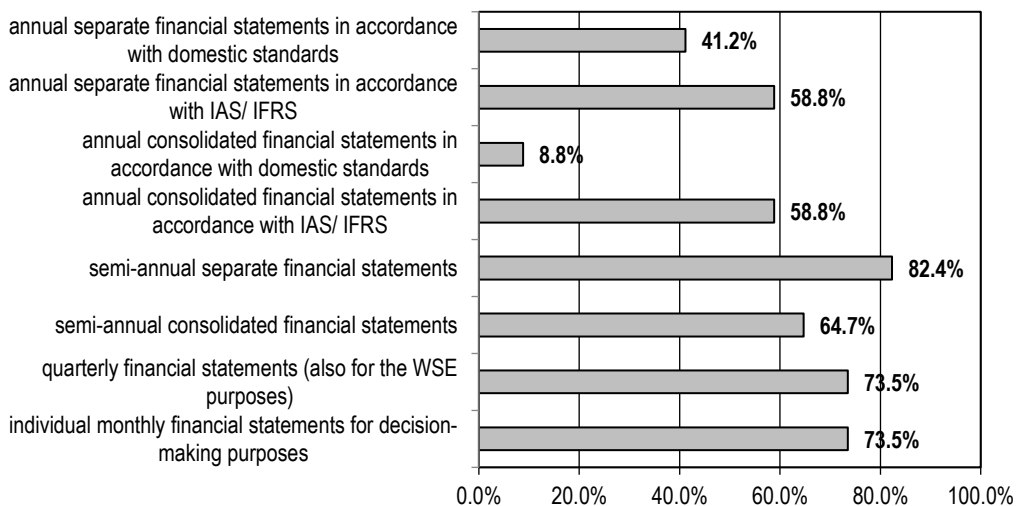
While describing the sample, it should be underlined that only some entities which returned completed questionnaires prepare their financial statements in accordance with international standards (IAS/ IFRS). It is 86, 4% of stock-listed companies and 8, 3% of the remaining companies, among which capital group entities are dominant. As for the stock-listed companies, it should be mentioned that they have a long-standing experience in applying international regulations to prepare their financial statements. On average, the period of eight or nine years was indicated, which is

directly related to the 2005 introduction of obligation to prepare financial statements of companies listed on the WSE in accordance with IAS/ IFRS. Regarding other entities, the period of applying international regulations is much shorter – most often those companies have prepared their financial statements in accordance with international regulations for two or three years.

4. Study results

The study started with determining what kinds of financial statements the analysed companies prepared. It was possible to choose an answer from several options including the type of financial statements (separate and consolidated), preparation standards (domestic and international) and frequency (annual, semi-annual, and quarterly). The results are presented in Chart 1.

Chart 1. Financial statements prepared by the analysed companies



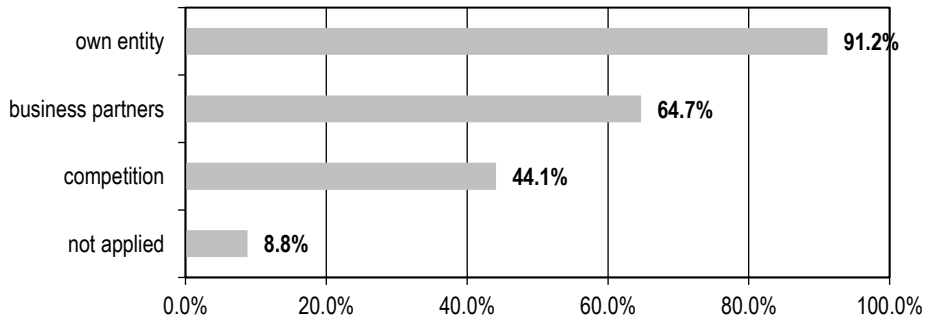
Source: author's compilation based on survey results

All analysed entities confirmed that they prepared separate statements, and 60% of the entities indicated that they prepared statements in accordance with IAS/ IFRS. All capital groups (67, 6%) confirmed that they prepared consolidated statements. What is more, seventy-five per cent of the entities indicated that they also prepared semi-annual and quarterly statements as well as individual monthly statements for decision-making purposes. It is worth mentioning that semi-annual and quarterly statements were prepared by all companies listed on the WSE, which results from disclosure requirements.

Further questions regarded the application of financial analysis of financial statements to assess economic position of company. The first one was to provide information whether a company applied such an analysis, and if so, whether it was

applied only to assess the financial position of their own entity or to assess other entities such as competition or business partners. The results are presented in Chart 2.

Chart 2. Application of financial analysis for economic assessment

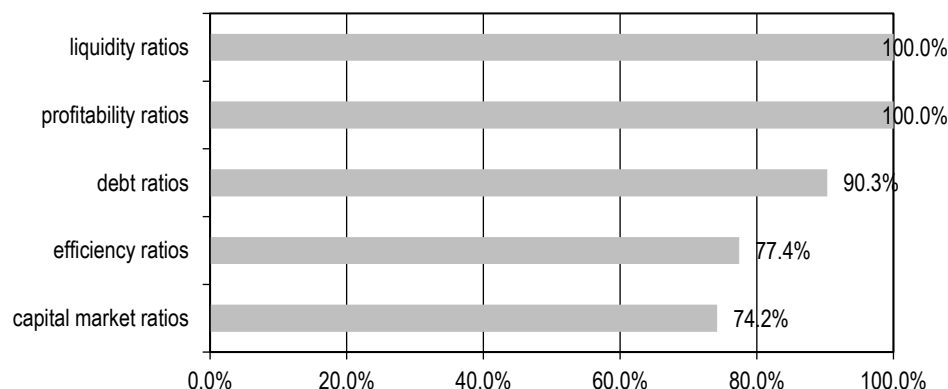


Source: author's compilation based on survey results.

The application of financial analysis of financial statements was confirmed by 91% of the respondents. They were all companies listed on the WSE and 75% of the remaining entities. All companies applied financial analysis to assess their financial position, almost two-thirds used it to assess economic position of their business partners as well, and more than half to assess competition. A deeper analysis of the results showed that the percentage rate of the application of financial analysis to assess business partners and competition was higher for the companies listed on the WSE. The rate was 81, 8% in the case of business partners and 54, 5% in the case of competition. For non-public companies the rates were 33, 3% and 25%, respectively. Similarly, a higher percentage rate of answers was received in the case of capital groups. The assessment of economic position of business partners was conducted by 73, 9% of them and 36, 4% of the remaining entities. In the case of competition assessment, the rate was 52, 2% and 27, 3%, respectively.

Next, the companies which applied financial analysis were requested to indicate which groups of ratios they most often used to assess financial position of entities conducting business activity. The results are presented in Chart 3.

Chart 3 Groups of financial ratios used by the analysed entities



Source: author's compilation based on survey results

All analysed entities confirmed that they applied liquidity and profitability ratios while 90% confirmed the use of debt ratios. It is worth mentioning that in the case of the first four ratio groups the results did not differ for public and private companies, capital groups and separate entities, companies with solely Polish capital and those with foreign capital when analysed separately. The only difference appeared in the case of capital market ratios which were applied by all stock-listed companies and only by 11% of the remaining entities. A similar difference was noted in the case of capital groups (82, 6%) and separate companies (12, 5%), which directly results from the fact that most of the capital groups participating in the study are listed on the Warsaw Stock Exchange.

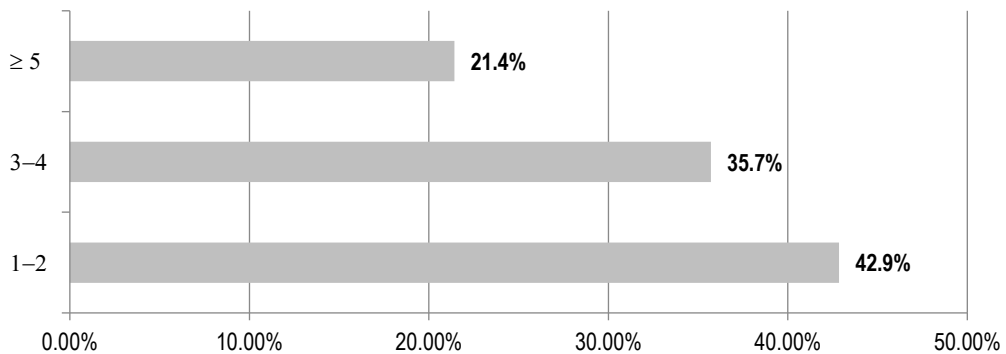
The respondents were also asked about the application of computer software for financial analysis. An affirmative answer was given by 93, 5% of the respondents. Computer software was used by 95% companies listed on the WSE and by 89, 9% of the remaining entities. Moreover, financial analysis was performed by 38, 7% of the respondents, using possibilities of their own financial and accounting software (e. g. modules purchased for financial analysis or tools integrated with ERP software) while the remaining 61, 3% performed financial analysis using spreadsheets. It is worth mentioning that in the case of companies with foreign capital (47, 3%) the percentage rate of the application of their own financial and accounting software for financial analysis purposes was slightly higher than in the case of companies with solely Polish capital (25%).

Further questions were related to the use of models of bankruptcy risk assessment developed on the basis of financial ratios. The aim of the first question was to indicate whether such models had been applied. Only 41% of the respondents gave an affirmative answer, from which 57, 1% were stock-listed companies and 42, 9% the

remaining companies. The models were also applied by 57, 1% of the capital groups which prepared consolidated financial statements.

The next question was to show whether in order to identify bankruptcy risks the respondents used one model or more and to determine which Polish bankruptcy risk models reviewed in the literature were most frequently applied. The results are presented in Chart 4 and Table 2.

Chart 4. Number of bankruptcy risk assessment models used by a single entity



Source: author's compilation based on survey results

Table 2. Models of bankruptcy risk identification used by the respondents

Model	% of indications	Model	% of indications
M. Pogodzinska and S. Sojak	57, 14%	M. Hamrol, B. Czajka and M. Piechocki	14, 29%
E. Maczynska	35, 71%	P. Stepień and D. Strak	14, 29%
A. Holda	35, 71%	A. Pogorzelski	7, 14%
D. Wierzba	35, 71%	J. Janek and M. Zuchowski	7, 14%
S. Sojak and S. Sawicki	35, 71%	B. Prusak	7, 14%
J. Gajdka and D. Stos	21, 43%	D. Apprenzeller and K. Szarzec	0, 00%
M. Maczynska and M. Zawadzki	21, 43%	Other	21, 43%

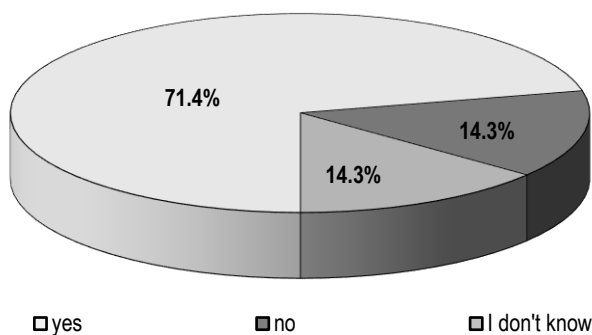
Source: author's compilation based on survey results

In order to assess bankruptcy risk the studied entities usually use one model or two. It was confirmed by almost 43% of the respondents. The use of at least five models was confirmed by 20% of them. A detailed analysis of the results showed that entities constituting capital groups and stock-listed companies used a smaller number of models. This might be related to a better economic position of those entities.

Regarding the type of a model, the analysis of the results showed that only one – Pogodzinska and Sojak’s model – was most popular, and more than half of the respondents confirmed that they used it. One-third of the respondents applied Maczynska’s, Holda’s, Wierzba’s and Sojak and Sawicki’s models. The percentage rate of application of another model is worth attention, in which case all the respondents indicated that they used Altman’s model.

Finally, respondents using bankruptcy risk identification models were asked whether such models could be applied by companies which prepared their financial statements in accordance with IAS/ IFRS. The results are presented in Chart 5.

Chart 5. Application of financial statements prepared in accordance with IAS/ IFRS to assess bankruptcy risk



Source: author’s compilation based on survey results

Almost 75% of the respondents gave an affirmative answer, with 90% of them being capital groups which prepared financial statements in accordance with IAS/ IFRS. Nevertheless, the respondents indicated that financial statements prepared in accordance with international regulations required adjustments and grouping, so that information included there could be used to assess company’s bankruptcy risk. It mainly regards items included in the statement of financial position and statement of comprehensive income.

The respondents were also asked whether models applied to measure individual items presented in the financial statements influenced the results of models assessing bankruptcy risk. The respondents were of one mind and gave an affirmative answer.

5. Summary and conclusions

Based on the survey study on the application of financial analysis and models of bankruptcy risk assessment conducted among the largest Polish companies, the following conclusions may be drawn:

- all entities perform financial analysis of their own economic position, almost two-thirds assess the economic position of their business partners and nearly half also assess their competition;
- entities use computer software to perform financial analysis. Nevertheless, they usually use separate spreadsheets rather than software integrated with the currently used financial and accounting software;
- merely 41% of the entities use models of bankruptcy risk identification to assess their financial position; usually companies listed on the WSE and capital groups use such models;
- almost half of the respondents use one model or two models described in the Polish literature to assess bankruptcy risk; most often it is Pogodzinska and Sojak's model;
- the respondents believe that information included in financial statements prepared in accordance with international standards can be applied to the Polish models of bankruptcy risk assessments provided that specific adjustments and revaluations are introduced to those statements;
- applied measurement methods influence the results received from models of bankruptcy risk assessment.

The assessment of financial position, and most significantly the assessment of risks to business activity are highly important, and therefore Polish companies use all tools and methods theoretically available. The use of financial analysis and models of bankruptcy risk assessment allows making reasonable decisions and limiting the level of risk. Nevertheless, results of performed analyses will always be distorted because of:

- changes in legal regulations, including amendments to the Accounting Act and international standards;
- lack of possibility to compare results of analyses over time due to a lack of unified accounting standards among business partners;
- change of measurement method, including introduction of goodwill as measurement method.

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