The analysis of the economic condition of selected wood-industry companies using Mączyńska & Zawadzki's model

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Abstract: *The analysis of the economic condition of selected wood-industry companies using Mączyńska & Zawadzki's model.* There are many methods used to verify economic condition of the company. Some of these methods allow to compared companies different sizes or even different sectors. In addition to the basic tools of fundamental analysis, which is usually focused on the indicator analysis, the specially developed methods for estimating bankruptcy risk should be distinguished. These methods are early-warning models, based on a polynomial structure. In this study Mączyńska & Zawadzki's polynomial to assess the economic condition of wood industry enterprises were verified.

Keywords: economic condition, early-warning methods, polynomial, wood industry company.

INTRODUCTION

It is well known that any decisions taken at management level are reflected in the economic results. Therefore a direct test of how the company effecting on the market is its economic condition, which can be assessed using several methods. Especially in the case of investments on the stock market during the global economic crisis, reliable indicators of actual economic situation of enterprises are wanted.

In addition to fundamental analysis, technical analysis and indicator analysis, some methods of early-warning bankruptcy prediction can be mentioned. These models have mostly a polynomial structure – on endogenous variable have specified influence some factors (exogenous variables) and their weights. The early-warning models allow to classify companies to the one of two to three groups, namely:

a) bankruptcy hazard,
b) no bankruptcy hazard,
c) uncertain classification

RESULTS

Among numerous early-warning models based on polynomial formula, a model developed by Elżbieta Mączyńska and Maciej Zawadzki deserve special attention:

$$Z_{MZ} = 9,498x_1 + 3,566x_2 + 2,903x_3 + 0,452x_4 - 1,498$$, whereas:

Z_{MZ} – Mączyńska & Zawadzki's polynomial endogenous variable,
x_1 – operating profit/total assets,
x_2 – equity capital/total assets,
x_3 – (net profit + amortization)/total liabilities,
x_4 – working assets/short-term liabilities.

The endogenous variable reaching value greater than 0 allows to classify company to a group of non-hazardous bankruptcy.

In this paper three representative wood stock-listed polish companies were tested – Forte SA, Drewex SA and Świecie SA. The data was taken from the publicly available company's quarterly statements. Most data was collected in 1st quarter 2009 –1st quarter 2013 period, other calculations were made for available data. Received values for companies were shown in figures 1, 2 and 3.

Figure 1 shows Mączyńska & Zawadzki's polynomial values achieved by the Forte SA in each quarter in 2009-2013.
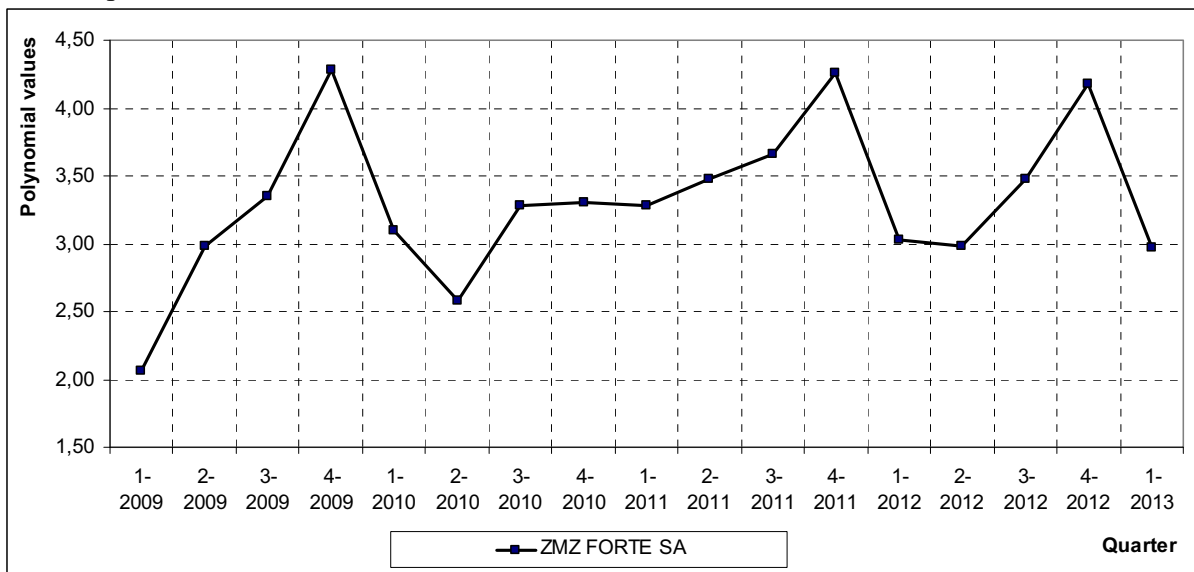

Figure 1. Mączyńska & Zawadzki's polynomial values of Forte SA
in 2009-2013

The analysis of endogenous variables of Mączyńska & Zawadzki's model presented in graphical form in Figure 1 leads to the conclusion that none of the presented values is not lower than 2, indicating positive premise about the condition of the company Forte SA. Company difficulties and the potential threat of bankruptcy would indicate values of Z_{MZ} model less than 0. A more detailed analysis of the results compiled in Figure 1 leads to the conclusion of seasonality achieved by the company results. Higher Mączyńska & Zawadzki's polynomial results are obtained by the company in the last quarter of each year, but other quarters results also indicate a lack of company liquidity difficulties.

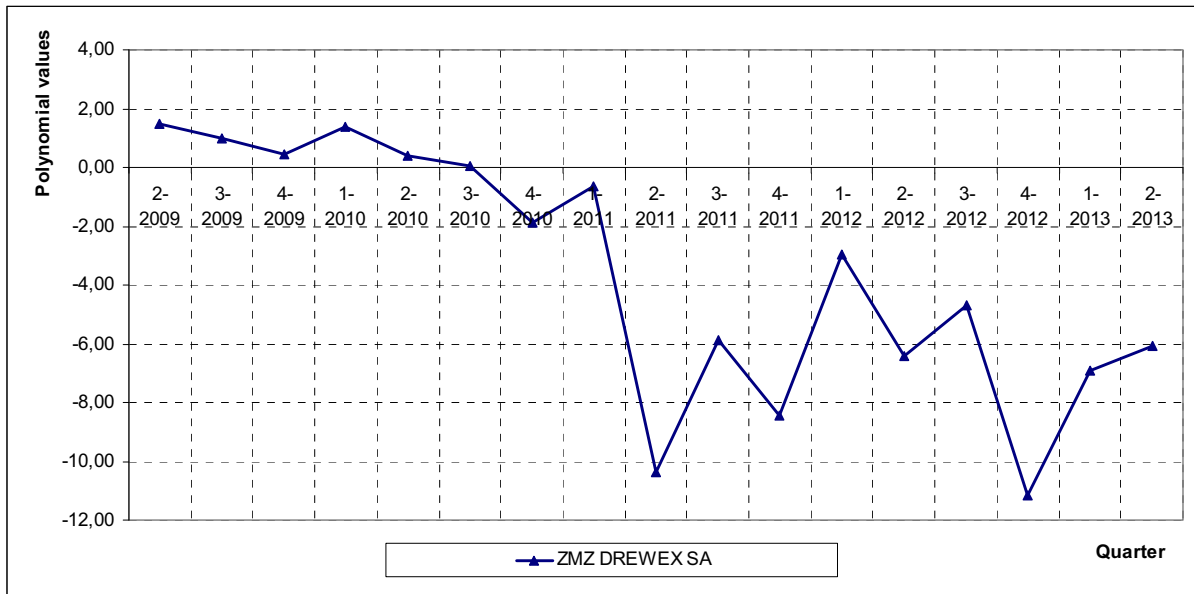Figure 2 shows a graphic illustration of Mączyńska & Zawadzki's polynomial in the company Drewex SA.

Figure 2. Mączyńska & Zawadzki's polynomial values for Drewex SA in 2009-2013

Results of the analysis carried out for the company Drewex SA shown in Figure 2 indicate deepening the company's difficulties. At the beginning of the analysis, Mączyńska & Zawadzki's polynomial values still remain at a positive level, however, the results are quite low and reach: 0,42 (4th quarter 2009), 0,40 (2nd quarter 2010) and even 0,04 (3rd quarter 2010). Values of Z_{MZ} model from this period predict company's difficulties in the future. These predictions have been well verified in 4th quarter of 2011, when company bankrupt. It can be assumed that the Mączyńska & Zawadzki's model allowed in this case to indicate problems with the company solvency for at least 6 quarters before their confirmation. Reducing company's long-term liabilities to 0 may be the reason of variations of Mączyńska & Zawadzki's polynomial values in last quarters of analysis.

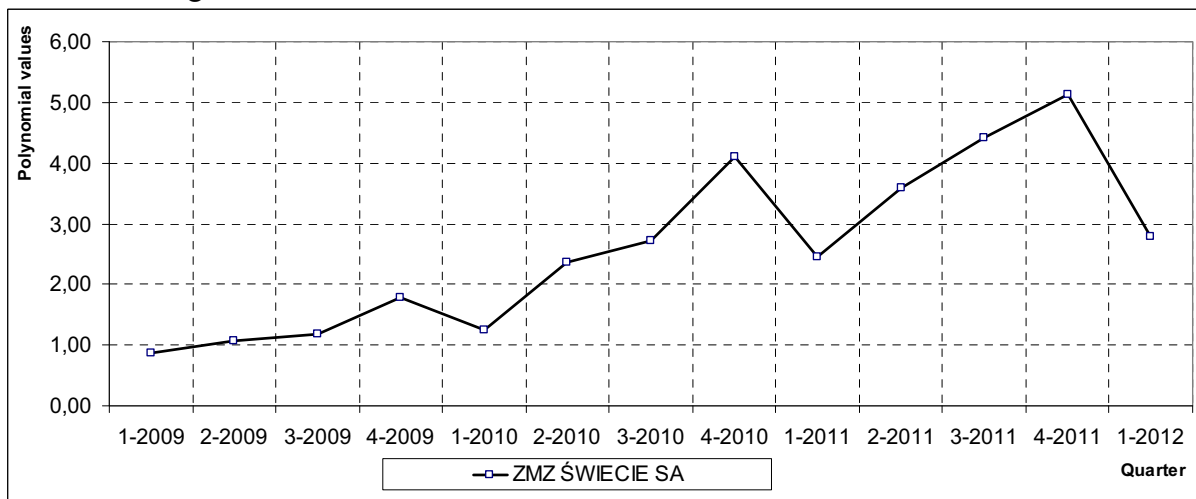The analysis of Mączyńska & Zawadzki's polynomial values of Świecie SA in 2009-2012 shows Figure 3.

Figure 3. Mączyńska & Zawadzki's polynomial values of Świecie SA in 2009-2012

As indicated results of Z_{MZ} model shown at Figure 3, Świecie SA is a company which, like Forte SA, is not at risk of bankruptcy. Values of Mączyńska & Zawadzki's polynomial for Świecie SA also show the seasonal nature of the results of company activity. In the last

quarter of each year the company achieved higher endogenous variable of Z_{MZ} model than at other times of the year. Such situation can be seen in the 4th quarter 2009 (1,78), 4th quarter 2010 (4,10) and 4th quarter 2011 (5,12). The values of Mączyńska & Zawadzki's method for Świecie SA remain throughout all the period an upward trend, which signs clearly no bankruptcy hazard.

CONCLUSIONS

It is well known that the financial statements analysis can provide many information about results of company activity. Economic values from the financial statements are the basis for investment decision, especially on stock market. To increase knowledge and make detailed analysis of not only stock-listed company, even a beginning analyst can used an indicator analysis. However, the early-warning methods analysis allows to acquire global view on the values from financial statements and proper company evaluation. Evaluated by the model's authors exogenous variables, weights and certain boarders for company classification to adequate group allow the researcher to obtain unambiguous results.

The analysis results allow to conclude that two of the examined wood industry companies did not show signs of bankruptcy risk. Drewex SA analysis confirmed company problems with solvency for 6 quarters before their actual occurrence.

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Streszczenie: *Analiza kondycji ekonomicznej wybranych przedsiębiorstw przemysłu drzewnego z wykorzystaniem modelu Mączyńskiej i Zawadzkiego.* Istnieje wiele metod wykorzystywanych do weryfikacji kondycji ekonomicznej przedsiębiorstwa. Część metod pozwala na porównywanie ze sobą przedsiębiorstw, które mają różną wielkość, a nawet działają w różnych sektorach gospodarki. Obok podstawowych narzędzi, takich jak analiza fundamentalna, zwykle skupiająca się na analizie wskaźnikowej, na wyróżnienie zasługują metody specjalnie opracowane do szacowania zagrożenia upadłością. Są to modele wczesnego ostrzegania, oparte na strukturze wielomianowej. W niniejszym opracowaniu znalazł zastosowanie jeden z takich modeli, a mianowicie model Mączyńskiej i Zawadzkiego.

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