Chapter 8
Risk of Business Bankruptcy:
The Application of DEA Method – Case Study of Slovak Businesses

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ABSTRACT

Recently, the demand of business owners to ensure the sustainability of their businesses has come to the fore. It results in a focus on identifying the risks of businesses' financial failure. Several prediction models can be applied in a given area. Which of these models is most suitable for Slovak companies? The aim of this chapter was to point out the possibility of applying the DEA method in measuring the financial health of companies and predicting the risk of their possible bankruptcy. The research was carried out on a sample of companies operating in the field of heat supply. The indicators were selected using related empirical studies, a univariate Logit model, and a correlation matrix. In this chapter, two main models were applied: the DEA model and the Logit model. The main conclusion of the paper is that the DEA method is a suitable alternative in assessing businesses' financial health.

INTRODUCTION

Diagnosing the financial health of companies, as well as predicting their financial failure, is currently one of the frequently discussed topics in the academic and business world of Slovakia. In order to maintain the prosperity and competitiveness of the company, it is very important to know what financial situation the company is in. In economic practice, it is not possible to make adequate managerial decisions without a detailed analysis of the company's financial health.

An important prerequisite for effective decision-making by business owners is a quality, comprehensive and timely diagnosis based on a detailed analysis of adverse events that threaten the company's activities.

DOI: 10.4018/978-1-7998-8609-9.ch008

Especially at the time of the COVID - 19 pandemic, it is very important to pay attention to the analysis of the financial health of companies. These analyzes are also necessary for strategic solutions at the country's macro level, as countries` governments need to know how companies respond to a pandemic. Based on it, it is possible to identify sectors of activity that are more vulnerable to the effects of the crisis, and the main financial management decisions which companies need to take in times of crisis (Achim et al. 2021).

In line with the increase in corporate bankruptcy risks, the aim of the chapter was to assess the financial health of companies using the DEA method and to compare its classification ability with the classification ability of Logit model.

FINANCIAL HEALTH OF THE COMPANY AND THE PROCESS OF ITS FAILURE

When focusing on health of the company, we must take into account all of its health issues. The company is perceived as "healthy" when it achieves a positive equity value, positive cash flow and positive economic result (Juárez, 2011).

In the early stages of a company's financial problems, the company fails to meet its liabilities, and this situation escalates into financial difficulties. These will subsequently result in the *failure* of the company, which means that the achieved rate of return on invested capital, taking into account the risk, is significantly lower than the rates achieved by others in similar positions (Klieštik et al., 2019). Karels and Prakash in 1987 reported several symptoms that are signs of failure, such as: negative net assets, no payments to creditors, collapse of corporate stock, inability to repay debt, bank overdrafts, non-payment of priority dividends, forced administration, etc. (Sanobar, 2012).

In 1932 FitzPatrick (Klieštik et al., 2019) defined 5 stages in the life of a company that lead to its failure. These are the following stages:

Stage 1 - Incubation: it is the period during which the unfavourable financial condition of the company develops and deepens.
Stage 2 - Financial Embarrassment: it is the period in which the first financial difficulties occur.
Stage 3 - Insolvency: (*Financial Insolvency*).
Stage 4 - Total Insolvency: liabilities exceed company's assets.
Stage 5 - Confirmed Insolvency: the status of insolvent business company is confirmed. At this stage, all legal instruments aimed at protecting creditors' rights are being implemented (Sanobar, 2012).

Bankruptcy is a forced state that follows after the company ran out of money and lost its ability to repay its liabilities or has too many debts. Bankruptcy can be defined as a situation where a company is unable to repay liabilities to its creditors, pay preference shares to shareholders, pay its suppliers or has overdrawn its accounts or the company has gone bankrupt under the relevant law Dimitras et al. (1996). Bankruptcy was also defined by the authors Ding, Song and Zen (2008), who state that bankruptcy is a situation where the company is unable to pay its liabilities, priority dividends and has overdrawn its accounts. In the vast majority of sources dealing with the issue, the authors define bankruptcy as the inability of the company to repay its liabilities, thus triggers bankruptcy processes (Pervan, Pervan and Vukoja, 2011). In 1993 Altman defined the concept of financial distress and pointed out that bankruptcy represents the legal end of financial distress (Ding, Song and Zen, 2008).