

ABSTRACT

Capital Structure of Public Companies in Poland in the Period Before and After the Outbreak of the Covid-19 Pandemic

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Capital structure is among the most important issues in corporate finance and is one of the longest-developing research topic in this area. Capital structure theory attempts to explain how companies make financing decisions and tries to answer two basic questions: 1) does the capital structure affect market value of a company, and 2) whether there is an optimal capital structure, i.e. one that balances benefits and risks, leading to maximization of the company's value and minimization of the cost of capital. A positive answer to the first question creates opportunities for managers to select financing that maximizes the value of the managed entity. A positive answer to the second question makes it possible to look for factors that determine the optimal capital structure.

The most often described and discussed theories of capital structure are: trade-off theory, pecking order theory, signaling theory and market timing theory. Trade-off theory was built on the basis of bankruptcy costs theory and assumes, that the choice between equity and debt is based on balancing the benefits of debt and the tax shield against the costs of financial distress and bankruptcy risk. What's more, the theory assumes that there is an optimal capital structure at which costs and benefits balance each other and lead to an increase in the market value of the company. Pecking order theory grew out of the theory of information asymmetry and assumes that companies follow a strict hierarchy in financing their operations, preferring internal sources first, followed by debt, and the issuance of shares is considered as the last possible source. According to the signaling theory managers by issuing debt or paying dividends send a signal to the market, informing current and potential investors about the financial standing of the company. Market timing theory arises from behavioral finance. In the context of capital structure this theory assumes that decisions to issue equity are based on the market valuation of a company. Fluctuations in market value have long-run impact on capital structure. Low leverage firms raise funds when

their market valuations are high, while high leverage firms raise funds when their market valuations are low.

The main purpose of the dissertation is to indicate the factors affecting capital structure and to verify theories of capital structure in the period before and during the COVID-19 pandemic. The goal was achieved by 1) analyzing the literature on capital structure theory and corporate finance, 2) reviewing research on capital structure in the literature, 3) conducting own empirical research. Based on the theories of capital structure developed in the literature and the review of empirical studies the main hypothesis was formulated: "The basic theories of capital structure, developed within the framework of finance theory, are reflected in the financing of public companies in Poland in the period before and after the outbreak of the COVID-19 pandemic." In order to verify the main hypothesis 6 additional sub-hypotheses and 2 research questions were formulated.

The added value of this work and originality is as follows:

- comprehensive verification of the theory of capital structure of Polish companies listed on the main market of the Warsaw Stock Exchange (WSE) and the NewConnect (NC) market,
- use of book data as well as market data as a measure of capital structure,
- testing the capital structure theory in the long-term,
- verification of the theory of capital structure on data from the period during the COVID-19 pandemic.

Dissertation consists of four chapters. The first chapter is devoted to introducing the issue of capital: presenting definitions, functions of capital in a company, the cost of capital and the risks associated with it. Subsequently the classification and characterization of different sources of financing was presented. Next, various theories of capital structure were presented, starting with the initial research on capital structure conducted by Durand and the Miller and Modigliani theory. The evolution of capital structure theory is further presented, describing the theories of bankruptcy costs, trade-off, agency costs, information asymmetry, pecking order and signaling. The chapter ends with a discussion of market timing theory.

In the second chapter research on the capital structure is presented and hypotheses are developed. The chapter begins with a description of research on the long-term changes in capital structure. The next part shows methods of measuring capital structure. Then

literature on determinants of capital structure is presented. Subsequent sections deal with research on various theories of capital structure: significance of the capital structure and its impact on the value of a company, pecking order and trade-off, and finally market timing. The next part of this chapter is devoted to the impact of the COVID-19 pandemic on the capital structure. This chapter ends with formulation of research hypotheses and questions.

The third chapter contains a description of the research data and research method. Verification of the hypotheses and attempt to answer research questions was based on an empirical study divided into several stages:

- 1) changes in the capital structure of Polish companies,
- 2) identification of internal and external determinants of the capital structure using panel models,
- 3) verification of the theories of capital structure:
 - a) Miller-Modigliani theorem for a world with company income tax,
 - b) pecking order theory,
 - c) trade-off theory,
 - d) market timing,using static and dynamic panel models,
- 4) the impact of the COVID-19 pandemic on the capital structure and risk.

The research sample included public companies listed on the main floor of the Warsaw Stock Exchange (WSE) and companies listed on the NewConnect market (NC). Research timeframe spans from 1997 to 2021. Each of the stages of the analysis mentioned above was conducted separately for WSE and NC companies, and divided into the entire period and pandemic period, i.e. for the WSE, the study was conducted over the period 1997-2021 and divided into the pre-pandemic period (years 2018 and 2019) and the pandemic period (years 2020 and 2021); for NC companies, the study was conducted over the period 2007-2021 and divided into the pre-pandemic period (years 2018 and 2019) and the pandemic period (years 2020 and 2021). Furthermore the book debt ratio and market debt ratio were used separately as a measure of capital structure.

The final chapter presents results of the empirical research. References are made to the hypotheses after each stage of the study. The dissertation concludes with a summary of the results.

Based on the empirical results several conclusions can be drawn.

1. The average debt level of the companies on the main market (WSE) in the years 1997-2021 fluctuated. After 2007, the average level of debt was in the range of 45-55%, long-term debt accounted for 8% to 18% of the total book value and was characterized by an upward trend. For the entire period, the average total debt ratio was 51%. In the case of companies listed on the NewConnect market, the average level of debt in 2007-2021 ranged from 47-65%, with an upward trend in years 2011-2019.
2. Several areas of factors were related the capital structure of Polish listed companies. The microeconomic factors included: profitability (negative relationship), company size (negative relationship), liquidity (negative relationship), asset structure (no clear relationship), non-debt tax shield (no clear relationship). Among industry factors financial leverage was associated with the average level of indebtedness in the industry (positive relationship) and to a certain degree by the average growth of companies in the industry (positive relationship). Among macroeconomic factors: GDP growth rate (negative relationship) and unemployment rate (no clear relationship), to a certain extent interest rate (negative relationship). Among the institutional factors: the degree of development of the banking sector (no clear relationship), size of loans (negative correlation), level of capitalization of the stock exchange (no clear relationship), amount of tax revenues to government (positive relationship).
3. In the context of research on the Miller-Modigliani theory, the results showed that there is a negative relationship between the cost of capital and the level of debt. This relationship was confirmed for companies from the Warsaw Stock Exchange and NewConnect, throughout the whole investigated period, as well as in the period immediately before and during the COVID-19 pandemic.
4. Tests of the pecking order theory have shown that there is a positive relationship between the financial deficit and the capital structure, both for WSE companies and companies from the NC market. However only 15-40% of the financial deficit was obtained in the form of debt, which is definitely less than 100%, as postulated by the pecking order theory. Therefore, it cannot be said that this theory explains the capital structure of listed companies in Poland, although some of the factors have a relationship with capital structure that is consistent with the predictions of this theory.
5. Tests of the trade-off theory showed that the pace of achieving the optimal capital structure varied, for WSE companies it ranged from 25-40% per year, and for NC

companies it was 20-30% per year. Identified relationships between factors and capital structure did not confirm this theory.

6. No evidence was found to confirm the market timing theory, neither in relation to companies from the WSE main market nor in relation to the NewConnect market.
7. Among the theories: pecking order, trade-off and market timing, based on the research results it is not possible to clearly indicate which theory fully explains the shaping of the capital structure of polish listed companies. The directions of the relationship between the capital structure and the determinants would indicate the pecking order theory, but the results of testing models with financial deficit, which is the most important variable in case of this theory, do not provide such confirmation. On the other side, tests of the trade-off theory showed the statistical significance of the most important parameter, i.e. the lagged debt ratio, but the method of verification with the proposed model may be questionable, and the identified relationships between the determinants and the capital structure do not support this theory.
8. In the study of factors influencing the level of debt, some differences can be identified whether accounting or market data was used, much more determinants indicated a significant relationship with capital structure when market data was employed. Some discrepancies were also identified due to type of market (WSE or NC) or time (before and during the pandemic). Much smaller differences were noticed in relation to the theories – regardless of the type of data used, time or type of market results led to the same conclusions. Overleveraged companies on the WSE market were characterized by increased risk.
9. The study of the capital structure in the context of risk during the COVID-19 pandemic showed that shares of the overleveraged companies listed on the WSE were characterized by increased total, systematic and specific risk during the COVID-19 pandemic, and among companies with relatively low indebtedness (underleveraged), total risk and specific risk decreased and the increase in systematic risk was slower than in the group of companies with relatively high debt. An increase in total and systematic risk could be observed on the NewConnect market during the pandemic. Among the overleveraged companies on this market, all three types of risk increased, but only the estimate for systematic risk was statistically significant.

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