

CHARLES UNIVERSITY
FACULTY OF SOCIAL SCIENCES
Institute of Economic Studies

Bachelor thesis

2018

Eva Parlášková

CHARLES UNIVERSITY
FACULTY OF SOCIAL SCIENCES

Institute of Economic Studies

Eva Parlásková

**Impact of Size and Other Factors on
SMEs Performance: Evidence from the
Czech Republic**

Bachelor thesis

Prague 2018

Author: Eva Parlásková

Supervisor: Mgr. Aleš Čornanič

Academic Year: 2017/2018

Bibliographic note

PARLÁSKOVÁ, E. (2018). *Impact of Size and Other Factors on SMEs Performance: Evidence from the Czech Republic*. Bachelor thesis. Charles University, Faculty of Social Sciences, Institute of Economic Studies. Supervisor Mgr. Aleš Čornanič

Abstract

This bachelor thesis is focused on an analysis of the impact of the SME size on its performance. Return on assets and cash flow from operations used as the performance measures. Some other additional factors are included in the models such as firm age and liquidity to provide a closer look at the determinants of the firm performance. Although there have been many studies examining the factors influencing the firm performance, these studies were analysing this problem in general. Thus, our research is focused on the private small and medium-sized enterprises in the Czech Republic in years 2010 – 2016. Empirical methods using the panel data were applied to test the hypotheses. The results show that there is a significant and a positive relationship between the firm size and its performance. This relationship does not change with the different measures of the firm performance nor the different measures of the firm size.

Keywords

Firm performance, size impact, determinants of firm performance, small and medium-sized enterprises, Czech Republic

Abstrakt

Tato bakalářská práce je zaměřená na analýzu vlivu velikosti malých a středních podniků na jejich výkonnost. Rentabilita aktiv a peněžní toky z provozní činnosti byly použity jako ukazatele výkonnosti podniků. Do modelů také byly zahrnuty další faktory jako například věk firmy a likvidita. Přestože se již mnoho studií věnovalo faktorům, které ovlivňují výkonnost firem, zkoumaly tento problém pouze obecně. Proto je tento výzkum zaměřen na soukromé malé a střední

podniky v České republice mezi lety 2010 – 2016. Na testování hypotéz byly aplikované empirické metody s použitím panelových dat. Výsledky ukázaly, že vztah mezi velikostí firmy a její výkonností je kladný a signifikantní. Tento vztah je stejný pro různé proměnné výkonnosti i pro různé proměnné velikosti firmy.

Klíčová slova

Výkonnost firmy, vliv velikosti, determinanty výkonnosti, malé a střední podniky, Česká republika

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.
2. The author hereby declares that all the sources and literature used have been properly cited.
3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague 21st June 2018

Eva Parlášková

Acknowledgments

I would like to express my sincere gratitude to the supervisor of this thesis, Mgr. Aleš Čornanič, for his valuable and constructive suggestions during the development of this thesis.

Bachelor Thesis Proposal

Institute of Economic Studies
Faculty of Social Sciences
Charles University in Prague

Author: Eva Parlášková

Supervisor: Mgr. Aleš Čornanič

Proposed Topic: Impact of Size and Other Factors on SMEs Performance:
Evidence from the Czech Republic

Research Question and Motivation

Firm performance has attracted attention of many researchers in recent years and there exist many studies examining it in many different ways. Related existing literature suggests that firm performance is affected by internal factors (firm related) and external factors (market-related). As small and medium-sized enterprises (SMEs) are a very important part of the economy, the main subject of my thesis is to examine determinants of SMEs performance in the Czech Republic.

The main factors determining whether an enterprise is an SME are number of employees and turnover or balance sheet total. A business is considered a SME if it employs fewer than 250 people and it has an annual turnover lower than 50 million euros (its balance sheet total cannot exceed 43 million euros). So I will be primarily interested in examining the effect of firm size on its performance.

Accounting earnings scaled by assets and cash flow from operations will be used as measures of firm performance. As mentioned above, I will primarily focus on the impact of size. The size of the firm will be measured by total assets, number of employees and sales. In order to control for firm specifics, I will include additional internal factors. Previous research of SMEs was also focused on SMEs and capital structure, which will be one of the other factors I will examine. With respect to related literature, the other internal factors except for capital structure I would like to add into the model are for example age, productivity, growth rate.

Contribution

The main contribution of this bachelor thesis would be a new perspective on the determinants of firm performance. Most of the previous studies were focused on macroeconomics factors as inflation or GDP (e.g. Kung'U (2011) and Murungi (2013)), but there is a lack of studies examining the effect of internal factors on SMEs performance.

Existing studies analysing the impact of size and factors connected to it on firm performance have already been made, but provide mixed evidence. Therefore, more research is needed in this area, because understanding the determinants of performance is really important for developing an effective performance strategy, so this thesis could be useful for managers for improving their firm's strategy.

Another contribution of this thesis would be using also cash flow from operations as a performance measure, which aims to reduce the impact of tax management. Companies want to optimize taxes, which could show on performance measured by earnings, but in case of the cash flow of operations, optimization is more difficult.

Methodology

Data will be collected for only Czech firms from databases EMIS (<https://www-emis-com.ezproxy.is.cuni.cz>) and Magnus Web (www.magnusweb.cz) and additional information about firm characteristics will be obtained from annual reports. The bachelor thesis will use econometrics methods for analysis.

Outline

- 1) Introduction
- 2) Literature Review
- 3) Data and Methodology
- 4) Analysis
- 5) Conclusion

Bibliography

MAGARETHA, F., & SUPARTIKA, N. (2016). Factors Affecting Profitability of Small Medium Enterprises (SMEs) Firm Listed in Indonesia Stock

Exchange. *Journal of Economics, Business and Management*, 4(2), 132-137.

MOČNIK, D., & ŠIREC, K. (2015). Determinants of a Fast-Growing Firm's Profits: Empirical Evidence for Slovenia. *The Journal of "Alexandru Ioan Cuza" University from Iasi*, 62(1), 37-54.

NIRESH, J. A., & VELNAMPY, T. (2014). Firm Size and Profitability: A Study of Listed Manufacturing Firms in Sri Lanka. *International Journal of Business and Management*, 9(4), 57-64.

PATTITONI, P., PETRACCI, B., & SPISNI, M. (2015). Determinants of profitability in the EU-15 area. *Applied Financial Economics*, 24(11), 763-775.

PERVAN, M., & VIŠIĆ, J. (2012). Influence of Firm Size on its Business Success. *Croatian Operational Research Review (CRORR)*, 3, 214-223.

SERRASQUIERO, Z. S., & NUNES, P. M. (2008). Performance and size: empirical evidence from Portuguese SMEs. *Small Business Economics*, 31, 195-217.

SIVATHAASAN, N., THARANIKA, R., SINTHUJA, M., & HANITHA, V. (2013). Factors determining Profitability: A Study of Selected Manufacturing Companies listed on Colombo Stock Exchange in Sri Lanka. *European Journal of Business and Management*, 5(27), 99-107.

Contents

INTRODUCTION	2
LITERATURE REVIEW	6
THEORIES ABOUT FIRM SIZE AND FIRM PERFORMANCE	6
EXISTING STUDIES ABOUT DETERMINANTS OF FIRM PERFORMANCE	7
<i>Firm Size and Performance</i>	7
<i>Other Determinants of Performance</i>	11
PAPERS EXAMINING SMES IN THE CZECH REPUBLIC	15
HYPOTHESES	17
DATA	19
SMES IN THE CZECH REPUBLIC	20
VARIABLES	21
<i>Description of Variables</i>	22
<i>Descriptive Statistics</i>	23
<i>Correlation between Variables</i>	25
METHODOLOGY	27
ANALYSIS OF THE EMPIRICAL RESULTS	28
<i>Regression Analysis</i>	28
DISCUSSION	34
CONCLUSION	36
BIBLIOGRAPHY	39
LIST OF APPENDICES	43
APPENDIX 1: DEFINITION OF SME IN THE EU	43
APPENDIX 2: REGRESSION RESULTS.....	44
APPENDIX 3: RESULTS OF THE SPECIFICATION TESTS	47
APPENDIX 4: RESULTS OF TESTS FOR AUTOCORRELATION AND HETEROSCEDASTICITY	47

Introduction

Firm performance and its determinants have always been a widely discussed theme in economics. Many researchers studied different variables that might have an impact on firm performance as the firm success or even survival mostly depends on firm performance (e.g. Niresh and Velnampy (2014), Pervan and Višić (2012), Sivathaasan, Tharanika, Sinthuja and Hanitha (2013)). Therefore, performance, especially profitability, is an instrument for determining the firm's success and understanding its determinants is one of the most important things for managers to develop and improve an effective performance strategy. Understanding the determinant of profitability is even more important in the case of SMEs because they cannot use their size (e.g. they are not able to benefit from economies of scale), but they are more adaptable and innovative. It is widely recognized that small and medium-sized enterprises are important for economic growth through generation of employment, income and innovations (Krasniqi, Shiroka-Pula, Kutllovci, 2008). Thus, I decided to focus on small and medium-sized businesses because they are a very important segment of the economy.

Despite the fact that there were many debates over the firm performance, it is not an unambiguously defined term. Many previous researchers that were focused on the performance of a firm define the firm's performance via profitability ratio (e.g. Return on Assets) or growth rate of firm's sales.

The success of a small business depends on its ability to continually earn profits in short and medium run. Earning a profit is important to a small business because profitability impacts whether a company can secure financing from a bank, attract investors to fund its operations and grow its business (Margaretha, Supartika, 2016). Without profits, a firm cannot attract other firms which could be potential partners or potential investors, because the most entrepreneurs invest with an intention to make a return and the profit earned of that firm might be a useful measurement of a value of that investment. Earning a profit allows you to open other business locations, acquire another business, target other markets and expand your operations into foreign territory, thus not just profitability, but also other achievements and goals are affected by profitability determinants (Margaretha, Supartika, 2016). Even borrowing money can be affected by these determinants, because company's profitability plays an important role in whether a

bank lends the company money. If a company cannot turn a profit it is typically seen as a risk for a lender. A business owner must understand the importance of profitability in business management and develop strategies that give his company the best chance at remaining profitable. The owner should create a business plan for expansion and analyse economic factors that affect the business performance.

However, through accounting and non-cash-based transactions, companies that appear very profitable can actually be at a financial risk if they are generating little cash from these profits. For this reason, I would like to measure the firm performance also in a different way. Except for profitability, cash flow from operations scaled by assets will be used as a second variable of performance. Cash flow from operations is a suitable performance measure because it is less sensitive for managerial manipulation and it aims to reduce the impact of tax management. Earnings or ratios based on earnings as a profitability measure can be manipulated fairly easily (Padgett, 2012). There are many non-cash items (depreciation, receivables etc.) included in earnings. Since cash flow from operations adjusts for e.g. liabilities, receivables, and depreciation, it is a more accurate measure of how much cash a company has generated than traditional measures of profitability.

The size of the firm is one of the decisive factors in the achievement of efficiency in its operations. In these days, large-scale production is considered to bring most economic results by the way of lower costs and higher returns (Serrasquero, Nunes, 2008). It is possible for larger companies to face competition more successfully because they are able to get better prices. Larger company size gives the company the ability to benefit from economies of scale and also the ability to dealing with customers and producers (Serrasquero, Nunes, 2008). While a smaller company may only be able to concentrate on one or two products, a larger company might have thousands of products in different areas. A larger company might also sell to a larger market. All of these things might suggest that larger companies can be more successful than smaller companies. But on the other hand, medium and especially small businesses will deal more directly with their customers, which will enable them to meet their needs more specifically and to offer a more individualized service. Because of their size and simpler structure, they will have a greater capacity to adapt to changes. It will allow them to know the variations in the market before anyone else. One reason why smaller firms are more adaptable is that many times the owner who is usually the main

decision maker is involved in the business and he can react to changes more quickly. Due to fewer employees, the owners are in a closer contact with their employees and workers are always more motivated when there is a closer relationship between them. Since the business is owned mostly by one person or a small group of people, decisions can be made and implemented faster than in a case of a large firm. It is also a personal investment, so decisions are made with better interests and more carefully. One of the problems for a small business could be getting a loan because banks and other financial institutions are not as willing to give loans to small firms as they are to larger ones. They appear riskier to them because SMEs have a lower bank collateral or they are more dependent on a particular client in comparison to large companies.

The main purpose of this thesis is to examine and specify the relationship between the firm performance of private SMEs and its size. I will use three measures of firm size – sales, total assets and number of employees to examine if the impact of size depends on the measure of size. In addition to studying the size influence, a closer look will be taken at the impact of other factors such as capital structure, firm age, liquidity, sales growth rate and asset turnover on the firm performance. Except for the typical measure of performance, return on assets, the cash flow from operations scaled by assets will be used which is not standard performance proxy used in the previous studies.

The research started with the collection of data about the firms and based on this information, the dataset was created. Although there are many papers studying the problem of performance and firm size, they are focused on the firms in general and there are just a few studies examining this relationship in the private SMEs sector. Thus, more research in the area of private SMEs is needed. This thesis will specify the relationship between the firm size and its performance and also examine which other factors are relevant in determining the performance of SMEs using data of 207 private SMEs in the Czech Republic for the years 2010 – 2016.

The thesis is structured as follows:

In the first section, there is a brief description of theories about the firm growth in general followed by the main part of the literature review, which introduces existing studies about the factors influencing the firm performance, however mostly focused on large companies.

The theoretical part is then followed by an empirical analysis of the relationship between the firm size and firm performance and other factors mentioned above. The research is focused on exclusively private Czech SMEs. The results of the analysis are compared to the existing literature in the discussion followed by the conclusion where the results are summarized. This thesis should provide a useful information for the companies for developing an effective performance strategy.

Literature Review

Theories about Firm Size and Firm Performance

The first theory focused on firm performance is called Gibrat's law which studies the impact of firm size on firm growth. This first formal model based on industry growth was presented in 1931 by Robert Gibrat who argued that firm growth is independent of firm size (Gibrat, 1931). Originally his work was based on the observations of skewed distributions in various economics areas. Sutton (1997) stated that Gibrat's main argument was that the skewed distribution consisted of a large number of small variables that were additive and independent of each other. Gibrat argued that the appropriate firm size function is a logarithmic function. Eventually, he found an asymmetric distribution across manufacturing firms in France in the early 20th century and he proposed a size-independent firm growth model. He created a law which says: "The profitability of a given proportionate change in size during a specified period is the same for all firms in a given industry – regardless of their size at the beginning of this period." (Mansfield, 1962, p. 1031). This is known as Gibrat's law of proportionate effect. Nowadays the Gibrat's law is interpreted as that the firm size and growth rate of this firm are independent of each other. In the past years, many researchers tested the validity of Gibrat's law. Santarelli, Klomp, Thurik (2005) summarized 60 of these studies and they said that "one cannot conclude that the Law is generally valid nor that it is systematically rejected". In general, Gibrat's law is rejected now, but there exist some studies that accept the law (even for a subsample). For example, Dunne and Hughes (1994), Johansson (2004) and Harris and Trainor (2005) reject the Gibrat's law. On the other hand, Acs and Audretsch (1990) and Acs and Armington (2001) suggest that Gibrat's law holds.

Another theory about firm growth is the Jovanovic's learning theory (Jovanovic, 1982). He started from ideas that smaller firms have higher and more variable growth rates and that firm size distribution is skewed to the right. He wanted to show that selection matters, which means that over time, efficient firms grow and survive and inefficient firms decline and fail. In his model he examined a small industry to which factors are supplied at a constant price, the product was homogeneous and the time-path for the demand is deterministic and known. Each

firm has its own true cost (the mean of its costs). Among all of these firms, the distribution of true costs is known, any firm does not know its true cost. The lower the true cost the higher is the probability of survival of the particular firm. He stated that there is always an infinite number of firms in the industry and every firm that wants to entry knows the equilibrium price sequence and their actions can be based on his knowledge. His model implies that the exit rate decreases with age of the firm and that the surviving firms are larger than exiting firms. In his research he defined the learning process that if a firm learns that it has lower costs than expected, it logically increases production.

Existing Studies about Determinants of Firm Performance

Firm performance has attracted attention of many researchers in recent years. Although many papers have been written about this topic, they provide mixed evidence. In the majority of existing studies firm size, capital structure, growth rate, liquidity and age were used as the main determinants of the firm's performance across the whole world.

Firm Size and Performance

Current evidence of the relationship between the firm size and its performance is mixed. So the results are ambiguous, but majority expect that there is a positive relationship between the firm size and its performance (Niresh and Velnampy, 2014, Serrasquero and Nunes, 2008, Pervan and Višić, 2012, Doğan, 2013, Al-Jafari and Al-Samman, 2015), but some papers found out negative relationship (Močnik and Širec, 2015, Salman and Yazdanfar, 2012, Ciszewska-Mlinarič and Mlinarič, 2010). Increased company size can positively influence the performance because larger firms are able to take the advantage of economies of scales. Different measures of performance are used in many cases. The return on assets was used most often as a proxy for firm's performance. Return on equity or profit margin were used as one of the other performance variables in mentioned researches.

Niresh and Velnampy (2014) examined the effects of firm size on the profitability of the listed manufacturing firms in Sri Lanka. They examined the impact of fifteen companies which were active in Colombo Stock Exchange between the years 2008 to 2012. Net profit ratio and return on assets had been

used as performance variables and total assets and total sales as a measure of firm size. For testing these variables, they used multiple regression and correlation methods. The results of the analysis showed that there is a weak positive relationship between the firm size and its profitability. The reason why this relationship is weak is a possible change in the strategy of these firms, used technology or poor organization structure.

These results do not differ even in the case of Portuguese SMEs which examined Serrasquero and Nunes (2008). Variables used as a measure of performance were given by the relationship between operational results and assets. They used total assets, sales and number of employees as the size variables and they concluded that there is a positive and statistically significant relationship between these size variables and performance of SMEs in Portugal. This relationship suggests that scale economies are a dominant factor for SMEs to reach higher levels of performance.

The results of Pervan and Višić (2012) paper about Croatian manufacturing industry showed that a firm size has a weak positive impact on firm profitability (it is statistically significant, but the coefficient is really low). The reason is that larger firms are able to charge higher prices and hence earn higher profits. They explained the weakness of this impact by several reasons. One of them could be the separation of ownership from management in modern corporations that shifted managers' focus from maximization of profit to maximization of managerial utility. They used a broad range of variables as a proxy for firm's performance. They used return on assets, return on equity, profit margin, EBIT margin and EBITDA margin as profitability measures.

Doğan (2013) used total assets, total sales and number of employees as size indicators and applied the multiple regression and correlation methods in the empirical analyses. He observed a positive relationship between size and performance in all models he examined. This may be explained by the fact that big firms are more effective than small firms since they make use of the scale economy.

Al-Jafari and Al Samman (2015) made a research about determinants of profitability of industrial companies listed on Muscat Securities Market in Oman. The profitability was measured by profit margin and return on assets and size of a firm was measured by sales of the firm. The panel ordinary least squares

technique provided results that the size variable has a positive and significant effect on both net profit margin and return on assets.

Zhou and de Wit (2009) examined the determinants of firm growth of 1100 Dutch enterprises in years 2003 and 2005. As the dependent variable (firm growth) they chose the relative growth in employment because they wanted to maximize their sample for the empirical analysis. One of the independent variables was also the firm size and the analysis showed that there is a negative, but statistically insignificant relationship between size and firm growth. They concluded that in some future studies, there should be included some other growth variables, especially the sales growth.

Leitner and Güldenbergl (2010) examined the impact of firm size and firm age on the SMEs performance in Austria. They used three variables measuring the firm performance – average profitability, turnover growth and employment growth. They decided to use the total number of employees as the size variable in their research. The results showed that neither the firm size nor the firm age has a significant impact on the SME performance in Austria.

Sivathaasan, Tharanika, Sinthuja and Hanitha (2013) studied some selected manufacturing companies which are listed on Colombo Stock Exchange in Sri Lanka as Niresh and Velnampy (2014) did. Although they also found a positive relationship between firm size and firm performance, they also found out that this relationship is not significant at 5% level. In their analysis they used return on assets and return on equity as a measure of firm performance and firm size was measured by total assets.

Another research had been made about manufacturing companies listed on Colombo Stock Exchange in Sri Lanka by Margaretha and Supartika (2016) and which provided statistically significant results of how the firm size influences its performance and these results said that there was a negative relationship between the size of a firm and its performance. They find out that the limitation of assets makes the management to increase the production levels at the optimum level. This limitation also makes the management think about the right strategy in the selection of markets, the appropriate technology, and the strategy to compete in the same market.

Močnik and Širec (2015) who examined the determinants of a fast-growing firm's profits in Slovenia found out that in their case there was a statistically significant negative association between firm size and profitability of this firm. The main question was if a profitability of a business (measured by the ratio of the net income to assets in this particular case) can be explained by the size of this business which was measured by their asset value. They expected that there would be a positive relationship because to become a large company with a profitable business, that firm should be growing steadily. They made a conclusion that fast-growing Slovene firms have not yet arrived at this point of profitable business.

The same results have provided Goggard, Tavakoli and Wilson (2006) in their paper. They tested the determinants of profitability in European manufacturing and services and in their research the firm size was negatively related with the firm profitability. They used return on assets as their profitability variable and total assets as the size variable in their analysis.

Another paper which provided results showing that there is a negative relationship between firm size and firm profitability is a paper written by Aparna (2015) who examined firms of Steel Authority of India Limited. He studied the impact of total assets which was the size variable on the return on assets which was the profitability variable.

Salman and Yazdanfar (2012) studied the profitability of Swedish micro firms during the year 2007. They used the ratio of operational results to total assets as the profitability variable (the dependent variable) and they decided to use the total number of employees as a measure of the firm size. This decision has been based on the theory of diminishing returns. Their research showed a significant and negative relationship between the size of a firm and its profitability. Their recommendation for Swedish micro firms is that they should not increase the number of employees, especially if they have good employees and that they should support the growth by using more advertising and innovation.

Ciszewska-Mlinarič and Mlinarič (2010) examined factors of performance of small and medium-sized enterprises in Slovenia. They used three dimensions of performance – efficiency, which was measured by return on equity and value added per employee, growth measured by change in sales and change in the number of employees and profitability, which was measured by return on sales

and return on assets. The total number of employees was used as a firm size variable. They found some statistically significant relationships between firm performance and firm size and age. Firm size has a negative impact on the firm's efficiency. They say that it is clear that bigger firms in terms of employment are less efficient in creating additional firm value. Firm age also has a negative effect on firm performance. In particular, it is negatively related to the firm growth and efficiency.

Other Determinants of Performance

Except for firm size which was measured in various ways researches also included many other factors.

Močnik and Širec (2015) examined the impact of leverage ratio which measures total debts to assets and labour costs apart from firm size. The results showed that the leverage ratio has the greatest impact on performance out of the three main variables. The relationship is negative and statistically significant and this means that the higher the indebtedness of a firm, the lower the profits. Another reason might be that profitable firms rely less on debt and use their own finances. In their research they used a dummy variable which examined the impact if the company is limited liability company or not. The positive coefficient of this interaction term between the dummy variable and leverage ratio means that businesses that secure their repayments of debts using personal assets borrow money somewhat easier than businesses with the limited liability legal form. The second examined variable was labour costs which has a positive impact on the firm performance which they said: “Exhibit that the better payment of labour affects leads to motivated and satisfied employees and might also be related to more educated employees.” (Močnik and Širec, 2015, p. 49)

Pattitoni, Petracci and Spisni (2015) used also total debt to total assets, the ratio of net working capital to total assets and growth rate of sales as their micro-level variables in their paper. In all models the total debt to total assets has a negative coefficient which means that it has a negative impact on profitability – SMEs often have greater difficulties in accessing funds. Net working capital to total assets and growth rate are positively related to profitability in their models. A

positive relationship between growth rate and profitability supports the idea that growth can help increase employee motivation and, thus, firm profitability.

Marharetha and Supartika (2016) included in their study firm age, growth rate, lagged profitability, productivity and industry affiliation. The relationship between firm age and its profitability is negative, but it is statistically insignificant. This relationship indicates that whether old or not the age of firm does not have any influence on the level of profitability. Growth rate and firm performance were negatively related and this relation is statistically significant. Lagged profitability also affects the profitability negatively, this relationship is significant and it shows us that the ability of the business to be more profitable in the previous years reduces the ability to earn profits in the current year. On the other hand, productivity and industry affiliation influence the profitability positively. The conclusion says that this relationship can be really useful for managers of the firm to help them improve their performance.

Sivathaasan, Tharanika, Sinthuja and Vanitha (2013) examined capital structure (measured by the ratio of total debt to total equity), working capital, non-debt tax shield and growth rate apart from firm size. The results showed that only capital structure and non-debt tax shield have a statistically significant impact on profitability and this relationship is positive in both cases. Working capital has positive impact and growth rate has a negative impact, however both impacts are not statistically significant (they are not significant at 5% level in particular).

Other determinants of performance that Pervan and Višić (2012) used are current ratio measured by ratio of current assets to total liabilities, asset turnover and debt ratio. They found out that liquidity measured by current ratio have a statistically insignificant impact on profitability. Greater indebtedness will decrease the profitability and growth of asset utilization expressed by asset turnover will lead to higher profitability.

Serrasquero and Nunes (2008) included debt ratio, liquidity, risk, assets structure and dummy variables determining the shareholder control and managerial control. The negative relationship between the level of debt and firm performance suggests that companies with a higher level of debt which are obligated to pay off the debt are not able to finance projects that would increase their profits. The relationship between assets structure and performance is also negative. And the relationship between separation of ownership control and

management and performance is positive and statistically significant. The results obtained suggest that the effects of giving more responsibility, motivation and specialization will be more relevant than agency problems between managers and owners. On the other hand, the relationships between the rest of the independent variables and firm performance were statistically insignificant.

Al-Jafari and Al Samman (2015) examined average tax rate measured by tax expense to earnings before tax, growth, fixed assets ratio, financial leverage and working capital as other determinants of profitability. There has been found a positive and significant relationship between growth, fixed assets, working capital and profitability. On the other hand, the relationship between financial leverage and profitability is negative and significant. Average tax rate and profitability are negatively related, but the relationship is not significant.

Doğan (2013) used as his control variables: firm age, leverage ratio and liquidity ratio. He found a strong and positive relationship between the liquidity ratio and return on assets. The increase in liquidity ratio of the firms cause a decrease in liquidity risk and this situation causes an increase in asset profitability. In contrast, the relationship between both the leverage ratio and firm age and firm profitability is positive.

Okurut, Ama, Mookodi, Okurut and Ama (2016) examined the determinants of SMEs growth in Botswana. They used the business earnings as the dependent variable and many independent variables: current ratio, leverage ratio, capital productivity, labour productivity, experience, ownership, sector, location, age of the entrepreneur, his education level and dummy variables for gender, bank credit, capacity, taxation, labour market regulations, licensing regulations and business registration. They found out that the production efficiency (measured by labour productivity and capital productivity) has a positive and significant effect on the SME growth. Other variables that have a positive and significant influence on SME growth are firm experience, access to bank credit and the age of the entrepreneur. On the other hand, the labour laws, which prohibit access to cheap foreign labour and being a female entrepreneur, have a negative and significant impact on the SME growth.

Except for the impact of firm size on firm growth, Zhou and de Wit (2009) studied many other independent variables. They divided them into four groups: individual determinants which included variables like personality traits, growth

motivation, personal background and individual competencies, organizational determinants which are firm attributes, firm strategies, firm-specific resources, organizational structure and dynamic capability, environmental determinants and growth barriers. From all of these variables, just seven determinants have a significant impact on firm growth. Among the individual determinants, need for achievement is negatively related to the firm growth. On the other hand, specific skills and growth motivation shows a positive relationship. From the group of the organizational determinants, preparedness to grow, financial performance and extra finance have a positive impact on the firm growth. Firm size is negatively related to the firm growth. This means that the environmental determinants do not have a statistically significant impact on firm growth. They say that organizational determinants have the greatest influence on firm growth.

Krasniqi, Shiroka-Pula and Kutllovci (2008) also studied the determinants of firm growth measured by the growth of employment. They examined three groups of variables. The ones related to the firm itself, the ones describing the entrepreneur and the ones connected to the industry or business environment. They examined the determinants of firm growth of SMEs in Kosova. Firm variables included variables like age, size at start-up, ownership and multiplant. Variables describing the entrepreneur were age, education and entrepreneurial team. The last group of variables included services, trade and sector growth. They said that their results reject the Gibrat's law and they support the learning theory which states that age and size of the firm are negatively related to the growth of the firm. Among the firm related variables, the firm that operates as multiplant or operates in two or more locations has higher growth rates. Another firm variable which has a positive effect on the firm growth is the separation of ownership from management. They found out that at the beginning the age of entrepreneur has a negative effect on the firm growth, but with increasing age and experience the effect changes from negative to positive. Education of entrepreneur does not have a significant impact of the firm growth. They say that firm operating in trade and manufacturing experience slower growth rates and they did not find any impact of the growth of the sector on firm growth.

Salman and Yazdanfar (2012) studied except for the impact of size on the profitability some other factors as well. They examined the firm age, total factor productivity growth, which was measured by the comparative advantage of

production or opportunity cost of producing a good and asset turnover, which was measured by the ratio of quantity of sales to total assets. Their main purpose is to provide empirical evidence by measuring the profitability of four important Swedish micro firm sectors (trade, health, transport, metal). They found out that the productivity growth sales and asset turnover have a significant and positive effect on the profitability, meanwhile the firm age has a negative effect on the firm profitability.

Batrancea, Morar, Masca, Catalin and Bechis (2017) examined the determinants of SMEs performance in Romania. They showed, how the firm performance (measured by return on assets and return on sales) was influenced by fixed assets, current assets, inventory, receivables, equity and liabilities. They obtained data from 1233 SMEs from five economic sectors during years 2004 – 2008. The results showed that in case of return on assets, variables that have some influence were current assets ratio, inventory ratio and equity to total liabilities ratio. Other rates did not influence return on assets in the majority of models. They found a positive and significant relationship between performance and equity to total liabilities. They say that they also found a significant and negative relationship between return on sales and return on assets and receivables ratio and inventory ratio. This means that managers can increase the SMEs performance by reducing the number of days of accounts receivable and inventories.

Papers Examining SMEs in the Czech Republic

Some papers examining the small and medium-sized enterprises in the Czech Republic have been written. They mostly discuss the environment and conditions for small and medium-sized enterprises in the Czech Republic and sometimes in Slovakia. Belás, Demjan, Habánik, Hudáková, Sipko (2015) examined the business environment of small and medium-sized enterprises in selected regions of the Czech Republic and Slovakia. Their research dealt with socio-economic parameters of the business environment – motivational factors, status in society, level of corruption, business risks, approach to debt finance, ability to manage financial risks and business optimism. They examined three regions (Zlín, Žilina, Trenčín) during the year 2013 and they obtained information from 180 Czech firms and 269 Slovak firms (449 observations). They have tested hypotheses about the major motivation in each region, about the degree of

corruption, how the businesses are able to manage risks and all of the other parameters mentioned above. They have found some differences between the approach in the Czech Republic and the approach in Slovakia. For example, the motivation for running one's own business in the Zlín region is the wish to have a job. In contrast, the motivation to start one's own business in both Slovak regions is money. In general, their research showed that entrepreneurs in these regions think that society perceives them negatively and this is what influences the motivation to start the business and the whole attitude to entrepreneurship. Many entrepreneurs also think that the support of the state is not sufficient. On the other hand, the majority of entrepreneurs believe that they can manage their financial risks properly and that their businesses can survive the next five years, despite the changes in the business environment and the decrease in SMEs performance in the years before this research.

Ehrenberger, Koudelková and Strielkowski (2015) examined the innovations as a factor of growth and success in Czech small and medium-sized enterprises. They posted a questionnaire online and they collected data from 1144 firms (but their analysis included companies which have less than 300 employees). Four models – innovation model, ownership model, impact factors model and barriers model – have been created. They concluded that many factors influencing innovation can be changed by the particular firm, so the firm should focus on these factors. One of the findings was that one factor which influences the innovation negatively is the legal form of the enterprise (limited companies tend to innovate more). They say that the Czech government should support SMEs more in the investment activities or education of employees.

Krejčí, Strielkowski and Čabelková (2015) examined the factors influencing the success of small and medium-sized enterprises in the information and technology sector in the Czech Republic. They also used a questionnaire to obtain data in total from 131 Czech ICT companies. They used three models with different variables for firm success. In the first model they used the earnings per employee as a measure of success, in the second one they used average logarithms of total revenues for 2010-2012 as the dependent variable and in the third model they used the logarithm of revenues in 2012. The first model depends on the historical value of earnings and expected decline in employee expenditures. They stated that the upside for this success rate is that the company is able to cover its

expenditures on operations from either previous sales or from domestic investments. In the second model, there was a positive, but a statistically insignificant relationship between the success and employee expenses and the age of the company. One of the significant elements was the age of a company CEO. Those enterprises, whose managing director's age is between 18–30 years, perform with lower average returns. And they found a surprising result which says that if an enterprise is planning to invest more into marketing in the following year, the results on returns will be worse. They said that the second model is better than the first one. In the third model, the logarithm of revenues in 2012 is positively and significantly dependent on the logarithm of total cost also in 2012, on the logarithm of marketing costs in 2010 and the number of employees. The only negative coefficient is for the logarithm of total costs in 2011. They say again, the third model is better than the second one. In their paper, they also tested the R&D values.

Hypotheses

As I presented previously, size is an important determinant of SMEs performance and the existing literature suggest that there is mostly a positive impact of size on the firm's performance. Therefore, my first hypothesis is:

H1: There is a positive relationship between the size of SMEs and its performance.

Previous literature says that the relationship between the capital structure of SME and its performance is positive. In line with existing literature, I expect that more profitable companies have a tendency to use relatively high debt in their capital structure because debt financing is more advantageous than financing with equity. So my second hypothesis for testing is:

H2: There is a positive relationship between the capital structure of SMEs and its performance.

The relationship between sales growth rate and firm performance is negative in the majority of studied papers. The reason might be that when the

number of sales increases, some costs like delivery, packing etc. increase as well, so it is possible that profitability decreases. For this reason, my third hypothesis is:

H3: There is a negative relationship between sales growth rate and SMEs performance.

The relationship between liquidity and SME performance is positive in the paper mentioned above (Doğan, 2013). Increasing liquidity causes a decrease in liquidity risk and thus it causes an increase in profitability. So my fourth hypothesis is:

H4: There is a positive relationship between liquidity and SMEs performance.

As I stated in my literature review, the results about the firm age are mixed. The researches stated that age does not have any impact on firm performance (Leitner and Guldenberg, 2010) or that there is a positive relationship between firm age and its performance (Doğan, 2013). With increasing age, firm managers can learn from their previous mistakes and develop more effective strategy how to improve their performance. My fifth hypothesis is then:

H5: There is a positive relationship between SME age and its performance.

Data

In this study I used primarily the database EMIS, MagnusWeb and annual reports provided by firms themselves, which are published in the business register. The companies were selected from EMIS and MagnusWeb according to set of criteria from EU for small and medium-sized enterprises which say that a business is called a SME if it employs fewer than 250 people and its annual turnover does not exceed 50 million euros (or its balance sheet total does not exceed 43 million euros. The reader can find the exact definition of SME I used in my thesis in Appendix 1. Some other information like return on assets, net sales revenue, total assets and growth rate were obtained from these databases as well. If any of the information were not available in the databases, I collected the data for each firm and each year directly from their annual reports.

The collection of data was really problematic, because not every firm publishes all the necessary variables I wanted to use in my research. According to an article published on www.businessinfo.cz¹, more than a half of companies in the Czech Republic do not comply their duty to publish their obligatory financial statements (they literally said that just every tenth company has published their financial statements for the year 2016), which made obtaining some information impossible. Especially, smaller companies are less willing to compile the financial reports, so generally, we can expect that the number of SMEs, who do not publish their financial statements, is lower, because it is more difficult for them and also, they are not audited many times. Just a few firms provided the cash flow statement and the majority of the firms did not include the attachment of the obligatory annual report, so the number of employees, which is usually included in this attachment, was the most difficult information to find.

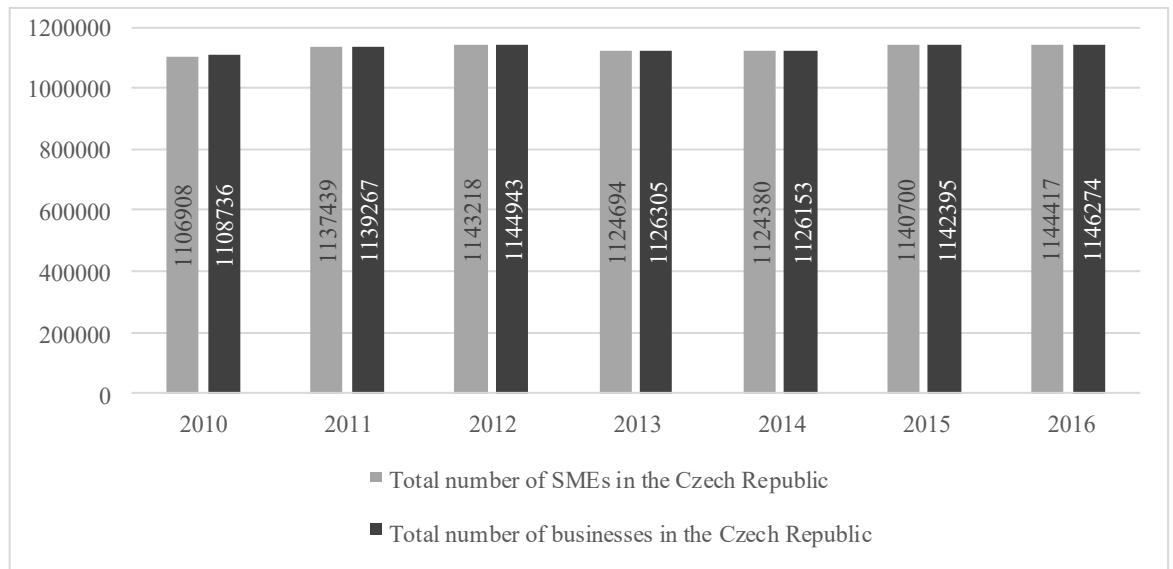
Considering these limitations, I obtained data from 207 firms in the Czech Republic which are not listed on any stock exchange between years 2010 – 2016, so I will use the panel data with 1449 observations.

¹ <http://www.businessinfo.cz/cs/clanky/ceske-firmy-informacni-povinnost-neplni-i-letos-je-jich-vetsina-92988.html>

SMEs in the Czech Republic

Small and medium-sized enterprises are a meaningful part of every developed economy and they are very important especially in the area of employment and economic performance of the particular country. According to the report of the ministry of industry and trade, in 2016 small and medium-sized enterprises stood for 99.8% of all businesses and they employed more than 1.8 million people (it means around 60% of people employed). The number of SMEs in the Czech Republic even increased in comparison to the year 2015. I used the data from Czech statistical office and the report from the ministry of industry and trade to create a bar chart which illustrates the changes in the number of SMEs and the number of people employed by SMEs in the Czech Republic during 2010 – 2016.

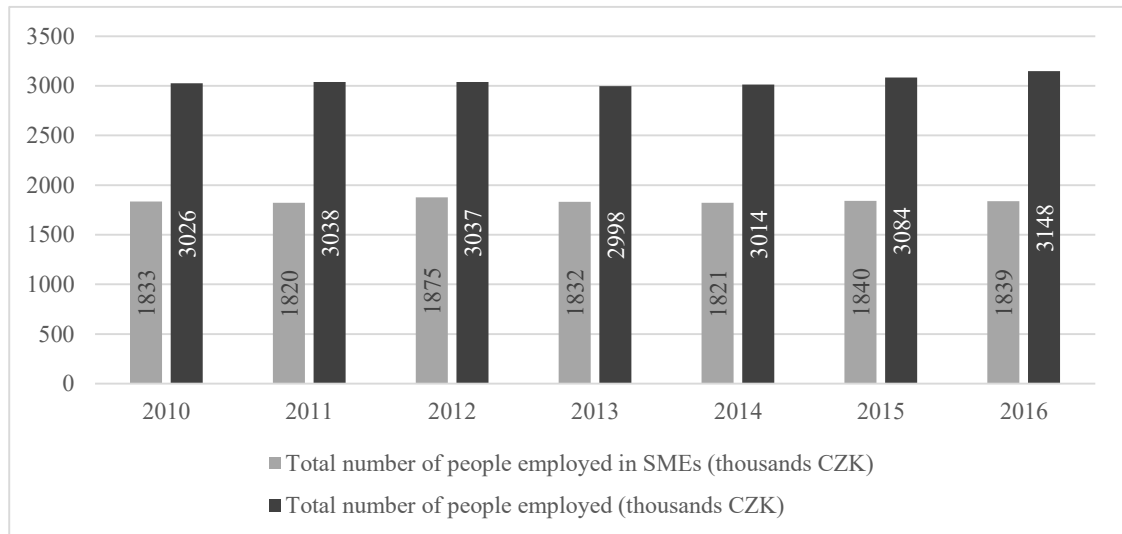
Figure 1: Number of SMEs in the Czech Republic during 2010 - 2016



Source: Report from Ministry of Industry, Czech Statistical Office

The chart shows that in the Czech Republic, small and medium-sized enterprises have always represented a major part of all businesses (in years 2010 – 2016 is it over 99.8%).

Figure 2: Number of people employed in SMEs in the Czech Republic



Source: Report from Ministry of Industry, Czech Statistical Office

The chart shows that over years 2010 – 2016, SMEs in the Czech Republic employed around 60% of the total number of people employed.

The participation of Czech small and medium-sized enterprises in the foreign market has been stable over a past few years. One of the main advantages of SMEs is the ability to adapt to market or legislative changes. Also, the less complicated organizational structure is an important reason why SMEs are an important part of the economy. Although the profitability of Czech small and medium-sized enterprises plays an important role in the sustainability of Czech economy, there are many barriers which make Czech SMEs more difficult to prosper. For this reason, many supporting projects have been established to create an easier environment for small and medium-sized businesses in the Czech Republic.

Variables

The main aim of this study is to examine the relationship between firm size and its performance in case of small and medium-sized enterprises. I used three measures of firm size to examine if the impact of size changes with the measurement. Performance was measured by the return on assets and cash flow from operations scaled by assets. Depending on the literature which was summarized in the section above, I decided to include some other variables which could have an effect on SMEs performance: growth rate, age, capital structure and

liquidity. In the following table, I present the variables and their proper measurement.

Table 1: Description of Variables

<i>Dependent</i>	
<i>Variable</i>	<i>Measurement</i>
Return on Assets (ROA)	Ratio between Net Income and Average Total Assets (this and previous year)
Cash Flow from Operations	$\frac{\text{Cash Flow from Operations}}{\frac{\text{Total Assets}_1 + \text{Total Assets}_0}{2}}$
<i>Independent</i>	
<i>Variable</i>	<i>Measurement</i>
Company Size 1	Natural Logarithm of Total Assets
Company Size 2	Total number of employees
Company Size 3	Natural Logarithm of Net Sales Revenue
Capital Structure	Ratio between Debt and Equity
Growth Rate	$GR = \frac{\text{Sales}_1 - \text{Sales}_0}{\text{Sales}_0}$
Liquidity	Ratio between Current Assets and Current Liabilities (Current Ratio)
Age	From the year the firm was established
Asset Turnover	$\frac{\text{Net Sales Revenue}}{\frac{\text{Total Assets}_1 + \text{Total Assets}_0}{2}}$

Description of Variables

Return on Assets: Return on assets shows how profitable a company is in relationship to total assets. In other words, the return on assets ratio measures how efficiently a company can manage its assets to generate earnings over the given period.

Cash Flow from Operations/Average Total Assets: Cash flow from operations shows cash payments and receipts coming from transactions connected with the determination of net income of a firm. Cash flow from operations adjusts for liabilities, receivables, and depreciation so it is a more accurate measure of how much cash a company has generated than traditional measures of profitability

(return on assets, earnings etc.). It is scaled by average total assets to get a more accurate measurement because it is natural that the cash flow from operations would be higher with growing size.

Capital Structure: Capital structure is a particular distribution of debt and equity a company uses to fund and finance its operations. Companies that use more debt than equity to finance assets have an aggressive capital structure, in contrast, companies that use more equity than debt have a conservative capital structure. It is usual that aggressive capital structure leads to higher growth rates and as I said when I stated my hypothesis, I believe that more profitable companies have a tendency to use relatively high debt in their capital structure.

Growth Rate: In our case I will examine the sales growth rate which is calculated as

$$GR = \frac{Sales_1 - Sales_0}{Sales_0}$$

where $Sales_1$ denotes sales during the current year and $Sales_0$ denotes sales from the last year. This ratio shows the increase or decrease in the business activity of a particular company. It also shows us how well a company improved over a given time period.

Liquidity: For measuring liquidity I will use current ratio which is a ratio between current assets and current liabilities. Current ratio is a liquidity ratio that shows a company's ability to pay off debts as they come due.

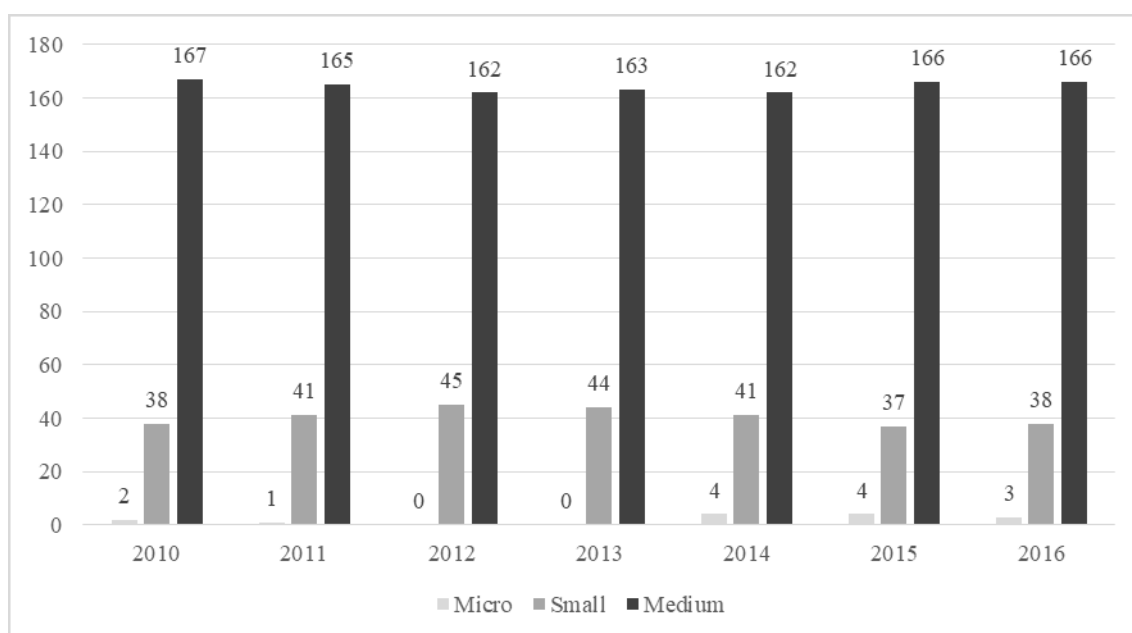
Asset Turnover: Asset turnover ratio measures the value of a firm's sales generated to the value of its assets. In my analysis, I used asset turnover as a proxy for the effect of industry, since this ratio can vary widely from one industry to another.

Descriptive Statistics

Firstly, I would like to discuss the descriptive statistics in this section, where I will state some basic information about the data in general.

As I said at the beginning, I obtained data from 207 Czech small and medium-sized businesses. Earlier, I described, how this group of businesses is divided, so at first, I created a bar chart which shows, how my group of businesses was structured over the examined years depending on the criteria of micro, small and medium-sized businesses.

Figure 3: Structure of selected SMEs



Source: Author's own calculations

We can see from the bar chart that the majority of selected companies is the size medium (over 70% for each year). In contrast, in my sample, there are just under ten micro firms. This might be because many of the smaller firms have missing data from many years and in many cases, they do not include the information I needed in their reports as I mentioned earlier.

In order to eliminate the effect of possible outliers, all variables were winsorized at 1% and 99% level. Table 2 shows the descriptive statistics for the variables used in the models. We can see that the average return on assets is around 6% (which means that on average a firm creates 6 CZK with its 100 CZK assets). We get almost the same value in the case of the cash flow from operations. In the case of the total number of employees it is visible that the average number is slightly above 100, which corresponds to the fact that the majority of my firms are from the medium-sized group. On average, the capital structure measured by the debt to equity ratio is higher than one, which indicates a relatively high indebtedness. When looking at the descriptive statistics of the age of the firm, it is visible that the mean and median are fairly close together, which means that the distribution of these values in the dataset is symmetrical. I can say the same about the values of total assets or the net sales revenue, but this fact is not surprising, because all of the values of these variables are very close in

contrast to the wide range of the firm age (the minimal and maximal values have a really big difference between them. This is because of the transformation of total assets and net sales revenue into the logarithmic form.

Table 2: Descriptive Statistics

<i>Variable</i>	<i>Minimum</i>	<i>Mean</i>	<i>Maximum</i>	<i>Median</i>	<i>Standard Deviation</i>
Return on Assets	-0.13	0.06	0.30	0.04	0.04
Cash Flow	-0.24	0.08	0.39	0.07	0.06
Total Assets	10.20	12.18	13.72	12.25	0.51
Employees	5	104	246	91	47.88
Net Sales Revenue	9.85	12.42	13.93	12.59	0.56
Capital structure	0.01	1.31	9.87	0.72	0.64
Age	8	19.46	59	19	2.66
Liquidity	0.40	2.86	15.21	1.96	1.00
Growth Rate	-0.58	0.06	1.24	0.03	0.09
Asset Turnover	0.07	1.68	7.88	1.34	0.59

Source: Author's own calculations

Correlation between Variables

Another very important thing which should be examined before the analysis itself is the intensity of correlation existing between variables. The results with significance levels are shown in the table below.

Table 3: Correlation between Variables

	<i>ROA</i>	<i>CFO</i>	<i>Size1</i>	<i>Size2</i>	<i>Size3</i>	<i>CS</i>	<i>Age</i>	<i>Liq</i>	<i>GR</i>	<i>AT</i>
<i>ROA</i>	1									
<i>CFO</i>	0.50***	1								
<i>Size1</i>	0.10***	0.06**	1							
<i>Size2</i>	0.14***	0.16***	0.45***	1						
<i>Size3</i>	0.21***	0.11***	0.57***	0.41***	1					
<i>CS</i>	-0.19***	-0.11***	0.00	-0.07***	0.21***	1				
<i>Age</i>	-0.02	0.02	0.02	0.21***	0.00	-0.18***	1			
<i>Liq</i>	0.14***	0.08***	-0.11***	-0.13***	-0.34***	-0.35***	0.09***	1		
<i>GR</i>	0.18***	0.06**	0.05*	0.01	0.15***	0.05*	-0.05*	-0.09***	1	
<i>AT</i>	0.12***	0.05*	-0.32***	-0.12***	0.44***	0.24***	-0.06*	-0.23***	0.12***	1

Note: ***, ** and * denote significance at 1%, 5% and 10% respectively

ROA represents the return on assets, CFO stands for the cash flow from operations scaled by the average total assets, Size1 stands for the natural logarithm of total assets, Size 2 is the total number of employees, Size3 represents the natural logarithm of the net sales revenue, CS is the capital structure, Liq stands for liquidity, GR is the sales growth rate and AT represents the asset turnover

Source: Author's own calculations

Table 3 shows that there exists a statistically significant relationship between the different measures of firm performance. This relationship is positive and it is one of the highest correlation coefficients in the table. The highest correlation coefficients (which are also statistically significant) are between the different measures of the firm size which will not be a problem, because, as I said earlier, I will separate those variables into different models. Correlation coefficients between other determinants are relatively small and really close to zero.

Methodology

For my analysis I have chosen to examine two sets of dependent variables – the return on assets and cash flow from operations scaled by the average total assets. I will use pooled OLS, fixed-effect and random-effect models to examine the impact of independent variables on the firm performance of SMEs in the Czech Republic and I will also test the five hypotheses which I have stated in the previous section. Primarily, I am interested in examining the relationship between the firm size and its performance, but I will also study the impact of indebtedness, an age of the firm etc. Except for the testing variables, I included asset turnover in my models, which can be considered as a control variable and it can also determine the effect of industry. Panel data sorted out by the year and the name of the firm will be used in my analysis. As I mentioned above, main independent variables, I would like to focus on, are firm size indicators. I used three different size variables – total assets, number of employees and net sales revenue. The natural logarithm of total assets and net sales revenue has been used to make my results more precise. These size variables have been used separately to prevent multicollinearity and autocorrelation problems in the models. The following regression models have been used in our analysis.

Model 1:

$$ROA_{it} = \beta_0 + \beta_1 SIZE1_{it} + \beta_2 CS_{it} + \beta_3 AGE_{it} + \beta_5 LIQ_{it} + \beta_6 GR_{it} + \beta_7 AT_{it} + u_{it}$$

Model 2:

$$ROA_{it} = \beta_0 + \beta_1 SIZE2_{it} + \beta_2 CS_{it} + \beta_3 AGE_{it} + \beta_5 LIQ_{it} + \beta_6 GR_{it} + \beta_7 AT_{it} + u_{it}$$

Model 3:

$$ROA_{it} = \beta_0 + \beta_1 SIZE3_{it} + \beta_2 CS_{it} + \beta_3 AGE_{it} + \beta_5 LIQ_{it} + \beta_6 GR_{it} + \beta_7 AT_{it} + u_{it}$$

Model 4:

$$CFO_{it} = \beta_0 + \beta_1 SIZE1_{it} + \beta_2 CS_{it} + \beta_3 AGE_{it} + \beta_5 LIQ_{it} + \beta_6 GR_{it} + \beta_7 AT_{it} + u_{it}$$

Model 5:

$$CFO_{it} = \beta_0 + \beta_1 SIZE2_{it} + \beta_2 CS_{it} + \beta_3 AGE_{it} + \beta_5 LIQ_{it} + \beta_6 GR_{it} + \beta_7 AT_{it} + u_{it}$$

Model 6:

$$CFO_{it} = \beta_0 + \beta_1 SIZE3_{it} + \beta_2 CS_{it} + \beta_3 AGE_{it} + \beta_5 LIQ_{it} + \beta_6 GR_{it} + \beta_7 AT_{it} + u_{it}$$

Where ROA_{it} is the return on assets, CFO_{it} represents the cash flow from operating activities scaled by average total assets, $SIZE1_{it}$ is the natural logarithm

of total assets, $SIZE2_{it}$ represents the total number of employees, $SIZE3_{it}$ is the natural logarithm of the net sales revenue, CS_{it} is the capital structure described above, AGE_{it} is the age of the firm, LIQ_{it} is liquidity represented by current ratio, GR_{it} is the sales growth rate, AT_{it} is the asset turnover.

Analysis of the Empirical Results

In this section, I will describe the classes of models I used, I will run some tests to examine the accuracy of the model (tests for heteroscedasticity and autocorrelation) and finally, I will present the results of my analysis. The RStudio will be used for the tests and analysis.

Regression Analysis

To examine the impact of selected explanatory variables on firm performance, I regressed return on assets and cash flow from operations scaled by assets on three sets of explanatory variables which I mentioned earlier in the section where I specified the models. I estimate the equations using different classes of models for panel data – Pooled OLS, Fixed Effect model and Random Effect and run some test to find out which model is the best one for my analysis.

Pooled OLS regression is probably the easiest way to estimate the equations. But the OLS assumptions cannot be violated in order to the pooled OLS estimates to be unbiased and consistent. The regressors should be uncorrelated with the error term, however the error term is mostly correlated over time for a given residual. (Woolridge, 2012)

Fixed Effects model is a method in which all behavioural differences between individual firms and over time are captured by the intercept. (Pervan and Višić, 2012) Under a strict exogeneity assumption on the explanatory variables, the fixed effects estimator is unbiased: roughly, the idiosyncratic error should be uncorrelated with each explanatory variable across all time periods. Fixed effect estimation involved a transformation to remove the unobserved effect prior to estimation. (Wooldridge, 2012) And then the OLS can be applied on the transformed equation.

Random Effects model is a method which decomposes unobserved firm or time effects from the error term. (Pervan and Višić, 2012) It assumes that the individual-specific effects are independent of the regressors. This individual-

specific effect is included in the error term. In this model we assume that the unobserved effect is uncorrelated with each explanatory variable at all periods, thus fixed effect estimator would be inefficient. There is an assumption which rules out the correlation between unobserved effect and explanatory variables as I mentioned above, but there is also an assumption which allows explanatory variables to be constant in time (which was not possible in the fixed effects model). (Wooldridge, 2012)

I estimated the six models from the model specification section by the different regressions. The reader can find the results in Appendix 2. In order to apply the appropriate estimator, I ran multiple tests. Firstly, I ran the Lagrange multiplier test to find out whether the random effect model is better than the pooled OLS regression. The test showed me that in all six cases the random effect model is more appropriate. Secondly, I tested if the fixed effect model is better than pooled OLS as well. In all six models, the fixed effect model is better. Finally, I used the Hausman specification test, which is a test that examines if the individual effects are uncorrelated with the other regressors in the model. (Pervan and Višić, 2013) This idea is that one uses the random effects estimates unless the Hausman test rejects the key random effects assumption. In practice, a failure to reject means either that the RE and FE estimated are sufficiently close so it does not matter which is used. (Wooldridge, 2012) After running the Hausman test, it showed that the fixed effects estimator is better than the random effects estimator – it rejected the null hypothesis in all six cases. The reader can find the results of these specification tests in Appendix 3.

After selecting the proper models to examine, the tests for autocorrelation, stationarity and heteroscedasticity had to be done. At first, I have done the Breusch-Godfrey test, which is a test for autocorrelation in the errors in a regression model. The null hypothesis is that there is no serial correlation of any order. In my analysis I rejected the null hypothesis in all six models which means that autocorrelation is present. Secondly, I tested each of my variables for the presence of a unit root with the use of augmented Dickey-Fuller test. Unit root can cause serious problems if it is present in the model. Fortunately, the augmented Dickey-Fuller test, which has the null hypothesis that a unit root is present, showed that all variables included in my models are stationary. The third thing, that needed to be examined, was the heteroscedasticity, which means that the

variance of the error term, given the explanatory variables, is not constant. Heteroscedasticity makes the standard formulas invalid. (Wooldridge, 2012) I used the Breusch-Pagan test to examine, whether the heteroscedasticity is present or not. It tests whether the variance of the errors from a regression is dependent on the values of the independent variables. The null hypothesis is that the regression is homoscedastic. In my analysis, I rejected the null hypothesis in all cases, so the heteroscedasticity is present in all my models. The reader can find the results of tests for heteroscedasticity and autocorrelation in Appendix 4.

After detecting possible problems in the models, I had to deal with them to make my estimations accurate. For the fixed effects models, where heteroscedasticity and autocorrelation have been present, a special function for correction of heteroscedasticity and autocorrelation (whc) in RStudio has been used. After correcting the heteroscedasticity and autocorrelation, I obtained the proper results to present.

Table 4: Regression Results

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
	<i>(ROA)</i>	<i>(ROA)</i>	<i>(ROA)</i>	<i>(CFO)</i>	<i>(CFO)</i>	<i>(CFO)</i>
Total Assets	0.049*** (0.011)			0.027 (0.017)		
Number of Employees		0.000* (0.000)			0.000 (0.000)	
Net Sales Revenue			0.049*** (0.015)			0.012 (0.014)
Capital Structure	-0.013*** (0.002)	-0.011*** (0.002)	-0.012*** (0.002)	-0.001 (0.004)	-0.000 (0.004)	-0.000 (0.004)
Age	0.002* (0.001)	0.003*** (0.001)	0.002* (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
Liquidity	0.003* (0.002)	0.003 (0.002)	0.004** (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
Growth Rate	0.023*** (0.007)	0.031*** (0.008)	0.019** (0.008)	0.015 (0.016)	0.019 (0.016)	0.017 (0.017)
Asset Turnover	0.036*** (0.009)	0.030*** (0.009)	0.018* (0.010)	0.023* (0.014)	0.020* (0.013)	0.017 (0.014)
Observations	1,449	1,449	1,449	1,449	1,449	1,449
R ²	0.19	0.17	0.20	0.03	0.03	0.03

Note: ***, ** and * denote significance at 1%, 5% and 10% respectively

The number in the brackets represents the standard error of the particular coefficient.

Source: Author's own calculations

Table 4 shows the regression results for all of the models.

In the first model, where the return on assets was used as the dependent variable the size has a positive effect on firm's performance. This relationship is statistically significant at 1% level and it has turned out as expected. The coefficient for the capital structure is negative and determines that if the debt to equity ratio increases by 1, the return on assets lowers by 0.013. This impact is also statistically significant at 1% level and I expected this impact to occur. Other

numeric variables I have included in the first model influence the firm's performance positively. The coefficients for age and liquidity are statistically significant at 10% level and growth rate and asset turnover coefficients are statistically significant at 1% level.

In Model 2 the return on assets was used as the firm's performance variable and the number of employees as the size variable. The results showed that there is a positive relationship and also it is statistically significant at 10% level. The capital structure has a statistically significant at 1% level and negative impact on the firm performance in the Model 2. Other variables in this model have a positive relationship with the firm performance measured by the return on assets. However, they are not all statistically significant. Age, growth rate and the asset turnover coefficients are statistically significant at 1% level, but the impact of liquidity in the second model is not significant.

The Model 3 results show that there is a positive and statistically significant influence on 1% level between the firm size measured by the net sales revenue and the firm's performance presented by the return on assets. In this case the capital structure has again a negative and statistically significant impact at 1% level on the firm performance. Capital structure is the only variable that has a negative impact because the rest of the variable influence the firm performance positively. In the case of firm age the impact is not statistically significant though. Other variables have a statistically significant relationship with the return on assets at least at 10% level.

In the Model 4, the cash flow from operations scaled by average total assets has been used as the measure of firm performance. There has been found a positive and statistically significant relationship between this measure of firm performance and firm size measured by the natural logarithm of total assets in this model, but this relationship is not significant. All of the variables have the same sign as in the previous models, but the only two variables have a statistically significant impact on the firm performance – the firm age and the asset turnover. Firm age has a positive and significant impact at 1% level and asset turnover has also positive influence, but significant at 10% level. The capital structure coefficient sign is negative as in previous cases, but it is not statistically significant. The rest of the numeric variables have positive signs.

In the fifth model, the results show that again there is not any significant relationship between the firm size measured by the total number of employees and the firm performance measured by the cash flow from operations divided by the average total assets. Age and asset turnover have both positive and statistically significant impact on the firm performance. Other variables do not have any statistically significant impact on the cash flow from operations.

The sixth model results say that the net sales revenue (which was used as the measure of the firm size in this model) does not have any statistically significant impact on the firm performance in this case. The only variable which has a significant impact on the cash flow from operations is the firm age, which influences the firm performance positively. The coefficients of other variables have the same signs as in the previous models, but these coefficients are not statistically significant.

Discussion

Before comparing the results with existing literature, I would like to summarize them. The impact of size is positive in every model, however in the last three models, the coefficients are insignificant. Because the relationship is positive, the first hypothesis is not rejected for this reason. I also wanted to examine whether the impact of firm size changes with the different measure of this variable. The results showed that the impact does not depend on the measure of the firm size. Capital structure has a negative impact on the firm performance. The impact is statistically significant in the first three models and insignificant in the rest of them. The second hypothesis says that there should be a negative relationship between the capital structure and the firm performance. The relationship is overall negative, thus the second hypothesis is not rejected. Firm age has always a positive and significant relationship with the firm performance, except for the third model. There, the relationship is statistically insignificant. The relationship is positive, thus the fifth hypothesis is not rejected. The liquidity coefficients are always positive, but they are statistically significant just in Model 1 and Model 3. For this reason, the fourth hypothesis is rejected because there is no statistically significant relationship between the liquidity and firm performance. Finally, the sales growth rate has positive coefficients in all models, however, the results are insignificant in the last three models. So we can say that the third hypothesis is not rejected in the case when the return on assets stands as the dependent variable and it is rejected in the model with cash flow from operations scaled by total assets as the measure of firm performance. In the previous researches, the literature was focused only on return on assets and not on the cash flow from operations. As the main topic of this thesis is to examine the effects of firm size, these results will be discussed first.

My results indicate that the net sales revenue has a positive impact on the return on assets is the same as in the case of Niresh and Velnampy (2014), Serrasquero and Nunes (2008), Doğan (2013) and Al-Jafari and Al Samman (2015). Found positive impact of total assets and total number of employees is in line with the results of Niresh and Velnampy (2014), Serrasquero and Nunes (2008) and Doğan (2013) who came up with the same conclusion as I did.

The only paper studying the impact of capital structure is the paper by Sivathaasan, Tharanika, Sinthuja and Vanitha (2013), but their results differ from mine. Because they found a positive relationship between the capital structure and the firm performance. I found that there is a negative influence of capital structure on either return on assets or cash flow from operations.

My results describing the relationship between the firm age and the firm performance are the same as only one paper: Doğan (2013). Meanwhile, other researches provided the results indicating an insignificant relationship: Leitner and Guldenberg (2010), Marharetha and Supartika (2016) or a negative relationship: Ciszewska-Mlinarič and Mlinarič (2010), Salman and Yazdanfar (2012) and Krasniqi, Shiroka-Pula and Kutllovci (2008).

In my analysis I detected a positive relationship between liquidity, measured by current ratio and return on assets. This result is the same as the result Doğan (2013) found, who was also examining liquidity as a firm performance determinant. My result is in contrast with the paper by Pervan and Višić (2012) who did not find any significant relationship between liquidity and firm performance.

My results which say that the overall relationship between the sales growth rate and the firm performance are in the line with paper by Pattitoni, Petracci and Spisni (2015) and they are different from the results of Marharetha and Supartika (2016) and Sivathaasan, Tharanika, Sinthuja and Vanitha (2013) who came up with results showing that there is a negative relationship between the growth rate and the firm performance.

Conclusion

Firm performance has attracted attention of many researchers in recent years and there exist many studies examining it in many different ways. Understanding the important determinants of firm performance is really important in these days because better performance usually makes the firm more successful.

The aim of this paper is to specify and examine the impact of size and other relevant factors influencing the SMEs performance using data from small and medium-sized enterprises located and operating in the Czech Republic which are not listed on any stock market. I used the data from a seven-year period (2010 – 2016) from 207 Czech SMEs. In my analysis I used one very common measurement of performance, which is the return on assets and one, which has not been included in many researches before and that is the cash flow from operations which I divided by the average total assets. Cash flow from operations is less sensitive than other performance variables because it cannot be manipulated that easily. It adjusts for liabilities, receivables and depreciation, thus it is a more accurate measure of how much cash a company has generated. Various size indicators have been used. Not just to have more precise results, but also because I wanted to examine, whether the impact of firm size changes with its measurement. Total assets, total number of employees and net sales revenue have been used in the analysis. Total assets and net sales revenue were both used as natural logarithms to make my analysis more precise. Except for size, the analysis included some other variables such as capital structure measured by the debt to equity ratio, firm age, liquidity measured by current ratio and sales growth rate to detect the important indicators which would help the leadership of the particular firm to develop and implement an effective firm performance strategy. I also used asset turnover as a control variable. Data were tested using the pooled OLS estimator, fixed effects panel data estimator and random effects panel data estimator, depending on which one was more suitable for each of the examined models. Eventually, the fixed effects model has been used according to the Hausman test.

The results of the analysis showed that the impact of size on the firm performance does not change with the measurement of this variable – it is positive for all variables in all models. It indicates that the bigger the firm is, the better the

performance is and it does not matter whether the size is measured by total assets, total number of employees or net sales revenue.

Capital structure, which is measured by the debt to equity ratio, has an overall negative impact on the firm performance. It could be because when firms use higher debt to make higher profits, they could struggle after when they have to pay off this debt and it would make them worse off. The higher value of debt in the capital structure make the debt to equity ratio higher. Managers have to manage to pay off the high debts instead if investing this money in activities that could improve their performance. Also, Serrasquero and Nunes (2008) stated that the greater level of risk and lower level of security associated with small companies imply greater efforts to pay off the debt and may contribute to diminished performance. This means that managers should reduce the debt used in the company and use the money they save from paying off the debt to for example reducing the prices which are connected to goods sold.

In my analysis the firm age has a positive and statistically significant impact on firm performance. I expected this relationship because as a company grows older, managers get more experience with making the company more successful. They can learn from their own mistakes which possibly made the firm worse off and in the future, they would avoid these mistakes.

The coefficients for liquidity are all positive, but not statistically significant. So liquidity does not have any significant impact on the firm performance.

The impact of the sales growth rate on the firm performance is positive overall.

Eventually, I hope that this thesis will provide firm managers and researchers a closer look at firm performance and factors which influence it. Except for this impact, I found out, that so many Czech firms do not provide proper information about their financial performance. This bachelor thesis has provided some detailed information about Czech small and medium-sized enterprises since I obtained data from different time periods.

Future researches should probably focus on examining more variables to make their models more precise. Another thing that could be useful in the future research would be collecting more data from a larger number of companies and

more different industries to get a more proper overview of the examined group of enterprises.

Bibliography

- ACS, Z., & ARMINGTON, C. (2001). Gibrat's Law Reconsidered: The Relationship Between Firm Growth, Establishment Age, Establishment Size and Firm Size. *Working Paper of the Regional Entrepreneurship Catalyst Kauffman Center for Entrepreneurial Leadership*.
- ACS, Z., & AUDRETSCH, D. (1990). Innovation and Small Firms. *Cambridge (MA), The MIT Press*.
- AL-JAFARI, M. K., & AL SAMMAN, H. (2015). Determinants of Profitability: Evidence from Industrial Companies Listed on Muscat Securities Market. *Review of European Studies*, 7(11), 303-311.
- APARNA, K. (2015). Determinants of Profitability-A Firm Level Study of Steel Authority Of India Limited (SAIL). *Journal of Business Management & Social Sciences Research*, 4(12), 1-4.
- BATRANCEA, I., MORAR, I.-D., MASCA, E., CATALIN, S., & BECHIS, L. (2018). Econometric Modeling of SME Performance. Case of Romania. *Sustainability*, 10(1), 1-15.
- BELÁS, J., DEMJAN, V., HABÁNIK, J., HUDÁKOVÁ, M., & SIPKO, J. (2015). The Business Environment of Small and Medium-Sized Enterprises in Selected Regions of the Czech Republic and Slovakia. *Business Administration and Management*, 18(1), 95-110.
- CISZEWSKA-MLINARIČ, M., & MLINARIČ, F. (2010). Small Firms in a Small Country: Managerial Factors, Internationalization and Performance of Slovenian SMEs. *Managing Global Transitions*, 8(3), 239-259.
- DOĞAN, M. (2013). Does Firm Size Affect The Firm Profitability? Evidence from Turkey. *Research Journal of Finance and Accounting*, 4(4), 53-59.
- DUNNE, P., & HUGHES, A. (1994). Age, Size, Growth and Survival: U.K. Companies in the 1980. *Journal of Industrial Economics*, 42(2), 115-140.
- EHRENBERGER, M., KOUDELKOVÁ, P., & STRIELKOWSKI, W. (2015). Factors Influencing Innovation in Small and Medium Enterprises in the Czech Republic. *Periodica Polytechnica Social and Management Sciences*, 23(2), 73-83.
- GIBRAT, R. (1931). *Les Inégalités Économiques*. Paris, Librairie du Recueil Sirey.

- GODDARD, J., TAVAKOLI, M., & WILSON, J. O. (2005). Determinants of profitability in European manufacturing and services: evidence from a dynamic panel model. *Applied Financial Economics*, 15(18), 1269-1282.
- GODDARD, J., TAVAKOLI, M., & WILSON, J. O. (2005). Determinants of profitability in European manufacturing and services: evidence from a dynamic panel model. *Applied Financial Economics*.
- HARRIS, R., & TRAINOR, M. (2005). Plant-level Analysis using the ARD: Another Look at Gibrat's Law. *Scottish Journal of Political Economy*, 52(3), 492-518.
- JOHANSSON, D. (2004). Is Small Beautiful? The Case of the Swedish IT Industry. *Entrepreneurship & Regional Development*, 16(3), 271-287.
- JOVANOVIĆ, B. (1982). Selection and Evolution of Industry. *Econometrica*, 50(3), 649-670.
- KRASNIQI, B. A., SHIROKA-PULA, J., & KUTLLOVCI, E. (2008). The determinants of entrepreneurship and small business growth in Kosova: evidence from new and established firms. *Int. J. Entrepreneurship and Innovation Management*, 8(3), 320-342.
- KREJČÍ, M., STRIELKOWSKI, W., & ČABELKOVÁ, I. (2015). Factors that Influence the Success of Small and Medium Enterprises in ICT: a Case Study from the Czech Republic. *Business: Theory and Practice*, 16(2), 304-315.
- LEITNER, H., & GÜLDENBERG, S. (2010). Generic strategies and firm performance in SMEs: longitudinal study of Austrian SMEs. *Small Business Economics*, 35, 169-189.
- MAGARETHA, F., & SUPARTIKA, N. (2016). Factors Affecting Profitability of Small Medium Enterprises (SMEs) Firm Listed in Indonesia Stock Exchange. *Journal of Economics, Business and Management*, 4(2), 132-137.
- MANSFIELD, E. (1962). Entry, Gibrat's Law, Innovation, and the Growth of Firms. *The American Economic Review*, 52(5), 1023-1051.
- Ministerstvo průmyslu a obchodu. (2016). Zpráva o vývoji malého a středního podnikání a jeho podpoře v roce 2016.

- MOČNIK, D., & ŠIREC, K. (2015). Determinants of a Fast-Growing Firm's Profits: Empirical Evidence for Slovenia. *The Journal of "Alexandru Ioan Cuza" University from Iasi*, 62(1), 37-54.
- NIRESH, J. A., & VELNAMPY, T. (2014). Firm Size and Profitability: A Study of Listed Manufacturing Firms in Sri Lanka. *International Journal of Business and Management*, 9(4), 57-64.
- OKURUT, F., AMA, N., MOOKODI, L., OKURUT, M., & AMA, H. (2016). Determinants of SMMEs Growth in Botswana. *International Journal of Economic Issues*, 9(1), 23-44.
- PADGETT, C. (2012). *Corporate governance: theory and practice*. Basingstoke, Hampshire: Palgrave Macmillan.
- PATTITONI, P., PETRACCI, B., & SPISNI, M. (2015). Determinants of profitability in the EU-15 area. *Applied Financial Economics*, 24(11), 763-775.
- PERVAN, M., & VIŠIĆ, J. (2012). Influence of Firm Size on its Business Success. *Croatian Operational Research Review (CRORR)*, 3, 214-223.
- RELANDER, P. (2010). Gibrat's law revisited - A study on Gibrat's law with models of industry dynamics.
- SALMAN, A. K., & YAZDANFAR, D. (2012). Profitability in Swedish Micro Firms: A Quantile Regression Approach. *International Business Research*, 5(8), 94-106.
- SANTARELLI, E., KLOMP, L., & THURIK, A. R. (2006). Gibrat's Law: an Overview of the Empirical Literature. *Entrepreneurship, Growth, and Innovation: the Dynamics of Firms and Industries*, 41-73.
- SERRASQUIERO, Z. S., & NUNES, P. M. (2008). Performance and size: empirical evidence from Portuguese SMEs. *Small Business Economics*, 31, 195-217.
- SIVATHAASAN, N., THARANIKA, R., SINTHUJA, M., & HANITHA, V. (2013). Factors determining Profitability: A Study of Selected Manufacturing Companies listed on Colombo Stock Exchange in Sri Lanka. *European Journal of Business and Management*, 5(27), 99-107.
- SUTTON, J. (1997). Gibrat's Legacy. *Journal of Economic Literature*, 35, 40-59.
- WOOLDRIDGE, J. (2012). *Introductory Econometrics: A Modern Approach*.

ZHOU, H., & DE WIT, G. (2009). Determinants and dimensions of firm growth.
SCALES EIM Research Reports, 1-34.

List of appendices

Appendix 1: Definition of SME in the EU

This is the definition of small and medium-sized enterprise used in the EU area. There are three groups of businesses which belong under the term small and medium-sized enterprise.

1. Micro, small and medium-sized businesses category in general is composed of businesses which employ fewer than 250 people and their annual turnover does not exceed 50 million euros (or their balance sheet total cannot exceed 43 million euros).
2. In small and medium-sized businesses category, small business is a business which employs fewer than 50 people and its annual turnover or balance sheet total is lower than 10 million euros.
3. In small and medium-sized businesses category, micro business is a business which employs fewer than 10 people and its annual turnover or balance sheet total does not exceed 2 million euros.

<i>Type of Business</i>	<i>Employees</i>	<i>Annual Turnover</i>	<i>or Balance Sheet Total</i>
Medium Business	< 250	< 50 million euros	< 43 million euros
Small Business	< 50	< 10 million euros	< 10 million euros
Micro Business	< 10	< 2 million euros	< 2 million euros

Appendix 2: Regression Results

Table 5: Pooled OLS Regression Results

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
	<i>(ROA)</i>	<i>(ROA)</i>	<i>(ROA)</i>	<i>(CFO)</i>	<i>(CFO)</i>	<i>(CFO)</i>
Total Assets	0.017*** (0.002)			0.015*** (0.004)		
Number of Employees		0.000*** (0.000)			0.000*** (0.000)	
Net Sales Revenue			0.021*** (0.002)			0.018*** (0.004)
Capital Structure	-0.009*** (0.001)	-0.008*** (0.001)	-0.010*** (0.001)	-0.007*** (0.002)	-0.006*** (0.002)	-0.007*** (0.002)
Age	-0.001** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000 (0.000)	-0.001 (0.000)	-0.000 (0.000)
Liquidity	0.004*** (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
Growth Rate	0.045*** (0.007)	0.048*** (0.007)	0.043*** (0.007)	0.023** (0.011)	0.025** (0.011)	0.021* (0.011)
Asset Turnover	0.014*** (0.002)	0.011*** (0.001)	0.005*** (0.002)	0.010*** (0.002)	0.009*** (0.002)	0.002 (0.002)
Observations	1,449	1,449	1,449	1,449	1,449	1,449
R ²	0.14	0.14	0.16	0.03	0.06	0.04

Note: ***, ** and * denote significance at 1%, 5% and 10% respectively

The number in the brackets represents the standard error of the particular coefficient.

Source: Author's own calculations

Table 6: Fixed Effects Regression Results

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
	<i>(ROA)</i>	<i>(ROA)</i>	<i>(ROA)</i>	<i>(CFO)</i>	<i>(CFO)</i>	<i>(CFO)</i>
Total Assets	0.049*** (0.007)			0.027** (0.014)		
Number of Employees		0.000*** (0.000)			0.000 (0.000)	
Net Sales Revenue			0.049*** (0.006)			0.012 (0.012)
Capital Structure	-0.013*** (0.001)	-0.011*** (0.001)	-0.012*** (0.001)	-0.001 (0.003)	-0.000 (0.003)	-0.000 (0.003)
Age	0.002** (0.001)	0.003*** (0.001)	0.002** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
Liquidity	0.003*** (0.001)	0.003** (0.001)	0.004*** (0.001)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
Growth Rate	0.023*** (0.006)	0.031*** (0.006)	0.019*** (0.006)	0.015 (0.011)	0.019* (0.011)	0.017 (0.011)
Asset Turnover	0.036*** (0.004)	0.030*** (0.004)	0.018*** (0.004)	0.023*** (0.008)	0.020*** (0.007)	0.017** (0.008)
Observations	1,449	1,449	1,449	1,449	1,449	1,449
R ²	0.19	0.17	0.20	0.03	0.03	0.03

Note: ***, ** and * denote significance at 1%, 5% and 10% respectively

The number in the brackets represents the standard error of the particular coefficient.

Source: Author's own calculations

Table 7: Random Effects Regression Results

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
	<i>(ROA)</i>	<i>(ROA)</i>	<i>(ROA)</i>	<i>(CFO)</i>	<i>(CFO)</i>	<i>(CFO)</i>
Total Assets	0.028*** (0.004)			0.018*** (0.006)		
Number of Employees		0.000*** (0.000)			0.000*** (0.000)	
Net Sales Revenue			0.029*** (0.004)			0.018*** (0.005)
Capital Structure	-0.012*** (0.001)	-0.011*** (0.001)	-0.012*** (0.001)	-0.005** (0.002)	-0.004* (0.002)	-0.005** (0.002)
Age	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)
Liquidity	0.004*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.003** (0.001)	0.003** (0.001)	0.004** (0.001)
Growth Rate	0.034*** (0.005)	0.038*** (0.005)	0.032** (0.005)	0.022** (0.010)	0.024** (0.010)	0.021** (0.010)
Asset Turnover	0.021*** (0.002)	0.017*** (0.002)	0.009*** (0.002)	0.012*** (0.003)	0.010*** (0.003)	0.004 (0.004)
Observations	1,449	1,449	1,449	1,449	1,449	1,449
R ²	0.15	0.14	0.16	0.02	0.03	0.02

Note: ***, ** and * denote significance at 1%, 5% and 10% respectively

The number in the brackets represents the standard error of the particular coefficient.

Source: Author's own calculations

Appendix 3: Results of the Specification Tests

Table 8: Results of the LM test for Random Effects versus OLS

Alternative hypothesis: significant effects

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Normal	29.384	28.424	28.840	16.734	15.220	16.204
P-value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16

Source: Author's own calculations

Table 9: Results of the F test for Fixed Effects versus OLS

Alternative hypothesis: significant effects

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
F	7.445	7.034	7.334	3.530	3.278	3.440
P-value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16

Source: Author's own calculations

Table 10: Results of the Hausman Test

Alternative hypothesis: one model in inconsistent

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Chisq	51.581	48.290	62.719	17.296	21.972	19.029
P-value	2.264e-09	1.034e-08	1.259e-11	0.008256	0.001225	0.004114

Source: Author's own calculations

Appendix 4: Results of Tests for Autocorrelation and Heteroscedasticity

Table 11: Results of Breusch-Godfrey Test for Autocorrelation

Alternative hypothesis: serial correlation in idiosyncratic errors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Chisq	158.430	165.960	158.790	159.440	158.620	159.890
P-value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16

Source: Author's own calculations

Table 12: Results of Breusch-Pagan Test for Heteroscedasticity

Alternative hypothesis: significant effects

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
Chisq	863.400	807.950	831.740	280.020	231.660	262.570
P-value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16

Source 1: Author's own calculations