THE IMPACT OF MACROECONOMIC INDICATORS UPON SME'S PROFITABILITY

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Abstract. *Profitability is one of the most volatile company's financial indicators: it is affected not only by internal but also by external, macro factors. Therefore, this research was aimed at evaluating the macroeconomic impact on SMEs' profitability. The paper presents the model with the macroeconomic factors affecting the profitability of a SME, which includes the macroeconomic indicators such as population and firms' number in a country, exports and imports, FDI, GDP, unemployment, inflation, taxes paid, average salary, and several others. The paper also deals with the dynamics of corporate profitability in Lithuania and shows a correlation between macro factors and corporate profitability. Most of the selected macroeconomic indicators such as inflation, average wages, the number of enterprises, the monetary base were found not to be statistically significant and had no strong correlation with corporate profitability. The VILIBOR interbank interest rate changes and the unemployment have the gretest impact on profitability.*

Key words: *macroeconomic indicators, profitability, SME, correlations*

Introduction

The European Union has about 23 million small and medium-sized enterprises (further in the text SMEs) which account for around 99% of all companies and employ about 75 million people (European Commission[1], 2007). By January 2012, in Lithuania were 83.624 companies, of them 83.169 were small and medium-sized and accounted for 99.4% of all operating businesses (Lithuanian Department of Statistics[2], 2012). It should also be noted that medium-sized enterprises account for only about 6% of all businesses, about a quarter are small, and micro enterprises account for about two-thirds of all firms. This means that when we talk about small and medium enterprises (SMEs), we often talk about a family business which has only one source of income – the profits of the enterprise.

Taken in mind these reasons, the **aim of this study was** to evaluate the impact of macroeconomic indicators on the SMEs profitability, even more so as one can see that

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profitability is one of the most volatile company's financial indicators and is affected by both internal and external factors.

For this purpose, the following tasks are raised:
1. To identify the characteristics of SMEs.
2. To analyze the dynamics of SME profitability.
3. To compile a the model of the macroeconomic factors affecting SME profitability.
4. Using a correlation analysis, to explore the relationship between macro indicators and corporate profitability.

To achieve these objectives, a systematic, logical, comparative, horizontal and vertical, correlation-regression analysis was used. The study integrates empirical material and theoretical knowledge, quantitative and qualitative data.

1. Literature review

In the recent years, the Lithuanian Republic devotes considerable attention to small and medium-sized companies but research related to the evaluation of complex macro factors and their influence on the final results of SMEs is not sufficient. Most recent studies in the field have been done made by B. Galinienė, N. Jukna and M. Tvaronavičienė and other authors.

The economic development is a dynamic process affecting SMEs on both macro and micro levels, as well as nationally and internationally. B. Martinkus, investigating SMEs, identifies factors influencing small business activity; he states that small businesses are mostly affected by the energy and raw materials, capital, innovation, labour, goods and services markets.

At present, most of macroeconomic researches are performed by banks and other institutions. Calculations and simulations are carried out by the Ministry of Economics and the Statistics Department under the Government of the Republic of Lithuania. Integrated transport companies' macro environment evaluation has shown that for this sector the most favourable factors are the political environment, GDP growth, infrastructure development and the EU membership (Žvirblis, 2007). The most unfavourable macroeconomic factors were identified to be labour shortage and the rising fuel prices. However, this survey focuses on logistics, and the general macroeconomic problems of Lithuania are not reflected in it.

Studies of the Lithuanian SMEs' development in the context of the overall European Union were carried out by the Observatory of European SMEs (http://ec.europa.eu). The most important individual business constraint reported by SMEs is the limited purchasing power of customers: 46% of the managers interviewed in the EU have reported this issue to have been a business constraint in the last two years. Two other business constraints affect a large number of SMEs in the EU; these are excessive administrative regulations

(more than a third – 36% – of SMEs claim to have faced difficulties in this area over the past two years) and the issue of the availability (35% of reported problems) and the cost of appropriate human resources (33%)[3].

Large enterprises in the EU export much more than small ones. Large exports account for 19% of their total turnover, while in small for only 5%. SMEs are more productive. Their profit increased by 15%, and the marketing costs of micro enterprises were 3.6%, while of large firms only 1.7%. Higher SME marketing costs reflect higher management costs, which directly affect the profitability decline. Higher revenues, operational efficiency and profitability generating innovations were more efficient in large firms, because 38% of SMEs did not receive any income from the updated or newly developed products; among the large enterprises such indicator was lower by more than one-third (24%). Back in 2007, a survey of the Observatory of European SMEs' results indicated that Lithuania took the first place in the EU in terms of working place vacancies: 56% of Lithuanian SME managers were facing a shortage of labour force, and 15% of CEOs said that they were unable to offer an adequate compensation to their employees.

R. Cressy in his business surveys made in England found that only 10% of SMEs borrowed for a long term assets (land, buildings, computer hardware, equipment), and a large share of financial resources for starting a business comes from relatives and acquaintances (Cressy, 2004). The author found that short-term liabilities of SMEs comprised 50% of total liabilities. This indicates that the funding is for the working capital rather than for the development of enterprises, investment in fixed assets, technologies, everything that increase the revenue and profit. The credit line on SME assets comprises 11% and in large manufacturing plants only 6%, and only 4.4% in services. The author concludes that large companies have acquired more working capital to cover debts and have no need to use a relatively more expensive credit line than a long-term loan. Long-term loans to SMEs accounted for only 3% of total capital and liabilities, in case of large companies they made 11.5%, with an average period of 7–8 years.

When studying the impact of macroeconomic factors on firms' profitability, the number of bankruptcies gives a similar result as the profitability analysis, because a company goes bankrupt when it is no longer able to generate profits and suffers losses. To examine the impact of macroeconomic factors on the number of bankruptcies, the following macro indicators were selected: GDP, inflation, unemployment, FDI, imports, changes in businesses, and the general population numbers (Jukna, Tvaronavičienė, 2004). It was found that the greatest impact on bankruptcies was made by unemployment, FDI, changes in businesses and the general population numbers. The second factor was the importance of GDP and inflation rates, and imports were found to have the least impact on bankruptcies.

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[3]   http://ec.europa.eu/enterprise/policies/sme/files/analysis/doc/2007/03_analytical_report_en.pdf

The author analyzed also attributed the importance of other factors for bankruptcies, such as government regulation, political stability, foreign policy, scientific technological achievements, business culture, etc.

The usage of macroeconomic indicators such as GDP, inflation, unemployment, FDI and imports, businesses and general population is not sufficient to assess the main factors affecting the business environment. Macro indicators such as export growth, tax burden or the average monthly salary are also important for evaluating the economy.

P. Bareika, investigating in the Baltic countries a correlation of stock prices with macroeconomic indicators, found that in Estonia the highest correlation coefficient was identified for GDP, unemployment and monetary market, in Latvia for individual consumption expenditure, GDP, construction cost index, unemployment, money supply, and in Lithuania the correlation coefficients were the same as in Latvia. Although the author concludes that there is a strong correlation between stock prices and the macroeconomic indicators, the individual consumption expenditure is a component of GDP, and the mentioned construction cost index is also related to the general inflation rate and influences only the construction sector-related group.

The scientific studies, models, methods and performed calculations gave a lot of valuable information on the model of macro indicators affecting SME profitability.

2. Methods

First of all, it is indispensable to define what the SME stands for. In Lithuania and the European Union, " medium-sized enterprises" are companies employing 50 to 249 employees, to small companies are ascribed those which employ 10 to 50 employees, and micro enterprises are those with less than 9 workers (Table 1).

TABLE 1. **The distribution of SMEs**

Enterprises	Number of employees	**Annual revenue**	**Assets value**
Medium	50–249	138 (mln. Lt)	93 (mln. Lt)
Small	10–49	24 (mln. Lt)	17 (mln. Lt)
Micro	1–9	7 (mln. Lt)	5 (mln. Lt)

Source: the Law of Lithuanian Small and Medium-sized Enterprises, 2002, October 22 d., No. IX-1142.

The **objective** of the research was to analyze the influence of macroeconomic indices on a the company's profitability. The study started with an overview of Lithuanian profitability descriptive statistics.

The research includes a quantitative analysis of Pearson's correlation between the macroeconomic indicators and Lithuanian companies' profitability. Data of rhe Department of Statistics of Lithuania will be used for the period from 2000 to 2010.

To obtain the estimated parameters (coefficients) of the model, calculations were made using SPSS Release 20.0.0 computer package.

3. SME profitability

Profitability is a financial indicator of how much one unit of turnover generates units of benefit. As has been mentioned, profitability is one of the most volatile parameters; in particular, it is most inconsistent among the smaller companies (see Table 2).

The biggest standard deviation is observed in the micro and small business area. In the study period, it was most stable, while the yield was lowest among the medium-sized enterprises. This explanation could be attributed to the wide sectorial distribution, which makes it possible to diversify risk and stabilize the rate of return; moreover, it was never negative, while all other participants in the economics haa a negative minimum profitability value.

TABLE 2. **Descriptive statistics of SME profitability**

	N	Minimum	Maximum	Mean	Std. deviation
1–9	10	-4.37	12.83	4.0175	**5.73704**
10–49	10	-.69	18.13	4.6451	**5.20778**
50–249	10	1.06	6.25	3.4250	1.80255
250>	10	-.58	8.11	3.6074	2.91653
1–249	10	-.67	11.44	3.9697	3.49507
All	10	-.18	10.30	3.8495	3.20922
Valid N (listwise)	10				

Source: compiled by the author.

Many researches show small companies to be more profitable, and the Lithuanian case also shows that the maximum yield was reached by small companies and they were generally profitable: their average yield was 4.65%, and they achieved the maximum profitability of 18.13%.

It is also worth mentioning that if a comparison were made of all SMEs versus large companies, profitability would not have been varying significantly: only a little higher than 0.5% SME standard deviation and 0.3% profitability. It is, therefore, important to analyze not only the SME shared, but pay more attention to individual business segments, which are often in different situations.

Reviewing the profitability of different business segments, the next chapter will present a model of the macroeconomic indicators influencing the profitability of SMEs.

4. The model of macroeconomic factors affecting SME profitability

In order to analyze the external factors affecting the business environment, according to other authors' studies and personal experience gained during the observation, was made a model of macroeconomic factors affecting SME profitability was compiled (Fig. 1).
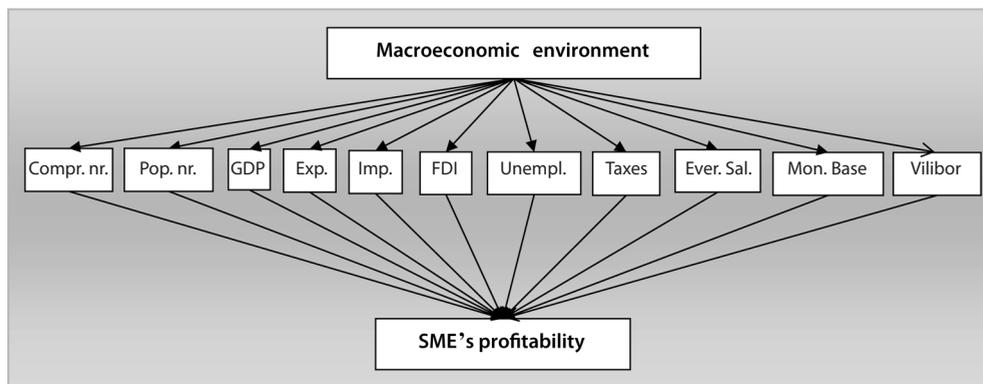

FIG. 1. **A model of macroeconomic factors affecting the profitability of SMEs**
Source: compiled by the author.

If the country's economy does not grow, it can be argued that the increasing *number of enterprises* means increased competition and reduced revenue per capita, which automatically tura into a lower corporate profitability. On the other hand, the increasing number of companies promote competitiveness, which is one of the major functions performed by a SME in a market economy. Therefore, it is likely that this figure will have a significant impact on the corporate financial performance of smaller SMES.

The dynamics in the *number of Population* as a macroeconomic indicator influencing SME, was chosen because, more than larger companies, they are sensitive to fluctuations in the labour market due to lower wages and worse visibility (Table 3). Furthermore, low-exporting small business is very dependent on the internal market participants.

TABLE 3. **Wage rate according to the number of employees in company groups**

	Average salary	1–9	10–49	50–249	250 >
All country	100	66.2	88.1	104.5	118.3
Private sector	100	66.7	86.1	108.2	126.0

Source: Lithuanian Department of Statistics, 2010.

The *GDP growth* in non-export-oriented SMEs is very important. This growth reflects in part the expansion of the domestic market. Automatically, when imports grew more slowly than the GDP, this indicates that there is a new space for purchasing demand and reduced competition in the local market, providing new opportunities to increase both

sale volume and profit. It is also important to consider the fact that the GDP is a direct link to corporate incomes, but whether incomes have a direct link to profitability will be revealed during the study.

Exports and *imports* are among the most important economic engines for a small country. Exporting firms have a greater diversification of business opportunities which guarantee stable revenues and profits, while importing promotes a faster technological development and competitive national economy by supplying raw materials and new technologies and services.

Foreign direct investment (FDI) is a are very important indicator that reflects the country's business environment. Most of economic institutions use this indicator when analyzing the macroeconomic situation of the countries. Foreign investment helps to create jobs, to reduce the current account deficit. On the other hand, FDI is more focused on big business and creates a more sophisticated competitive environment in the country's economy; offering better salaries, it attracts the best employees, as confirmed surveys by of the Observatory of the European SMEs 2007.

The high level of *unemployment, as* regarded from only the company's side, has not always only the bad significance: high unemployment means that the market has a lot of free labour, which in this case contributes to the high supply and better prices of the working power. Of course, this is only an empirical phenomenon. On the overall macro-level, high unemployment rates have similarly negative consequences as the high *inflation*; because of relatively small workers the market is becoming less solvent, the Government collects less personal incomes taxes and incomes to the SODRA budget and still has to support the increasing army of unemployed people budget, so there is less money for other many different investment programs. *Taxation* has always been one of the most important topics of discussions between the government and business. Business naturally interested in minimum taxes; the government must fulfil its social obligations to society, based on them and on regulating the market. It is a very important to analyse the taxation factor, because it limits the revenue and profit. Analyzing the impact of taxes on SME profitability, it is important to keep in mind that taxes break small businesses, instead of improving their financial condition. .

Corporate profitability, among other indicators, also depends on the *wages* paid to employees, and small business profitability is further influenced by labour costs due to the lower level of technology and related manufacturing efficiencies and the lower ability to pay. For the above reasons, the average salary is an important indicator which may have a strong relationship with SME profitability.

The monetary base, consisting of currency in circulation, credit institutions' current account and reserve requirements, can have a significant impact on business and financial results, including profitability. In addition to this financial indicator, there is another equally important indicator related to the availability of financial resources and borrowing costs; it is the VILIBOR interbank interest rate.

Resuming the model of macroeconomic factors affecting SME profitability, following hypotheses could be raised:

Hypothesis 1: all macroeconomic factors have a strong influence on corporate profitability.

Hypothesis 2: unemployment, taxes, the number of companies, VILIBOR rate, wage, inflation have a strong negative correlation with corporate profitability.

5. Results

The research shows that the greatest correlations with the chosen macroeconomic indicators can be observed for micro enterprises (most of the correlation coefficients are

TABLE 4. **Macroeconomic indicators and correlation with SME profitability**

		POPNR	GDP	FDI	EXP	IMP	INFL	UNPL	WAGE	COM-PNR	TAX	MONYB	VILIB
1-9	*Pearson's correlation*	-.197	.536	.385	.507	**.606***	„545	**-.906***	.188	-.289	**.641***	„310	-.591
	Sig. (2-tailed)	.562	.089	.243	.111	.048	.083	.000	.580	.389	.033	.353	.055
	N	11	11	11	11	11	11	11	11	11	11	11	11
10–49	*Pearson's correlation*	-.077	.471	.329	.348	.390	.362	**-.720***	.091	-.216	.431	.197	„495
	Sig. (2-tailed)	.822	.144	.323	.295	.235	.274	.013	.789	.523	.186	.561	.121
	N	11	11	11	11	11	11	11	11	11	11	11	11
50–249	*Pearson's correlation*	-.223	.531	.376	.440	.497	.296	**-.898***	.101	-.226	.491	.251	**-.780***
	Sig. (2-tailed)	.511	.093	.255	.176	.120	.377	.000	.768	.504	.125	.456	.005
	N	11	11	11	11	11	11	11	11	11	11	11	11
250>	*Pearson's correlation*	-.190	.499	.329	.345	.385	.180	**-.770***	.069	-.166	.377	.217	**-.798***
	Sig. (2-tailed)	.575	.118	.324	.299	.243	.597	.006	.840	.627	.253	.522	.003
	N	11	11	11	11	11	11	11	11	11	11	11	11
1–249	*Pearson's correlation*	-.137	.552	.365	.432	.502	.421	**-.868***	.117	-.274	.534	.245	**-.628***
	Sig. (2-tailed)	.687	.078	.270	.184	.116	.198	.001	.732	.415	.091	.468	.039
	N	11	11	11	11	11	11	11	11	11	11	11	11
All	*Pearson's correlation*	-.161	.550	.366	.417	.479	.353	**-.863***	.106	-.243	.499	.245	**-.706***
	Sig. (2-tailed)	.636	.080	.268	.202	.136	.287	.001	.756	.471	.118	.467	.015
	N	11	11	11	11	11	11	11	11	11	11	11	11

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

higher with a higher degree of significance) than for large companies. A possible reason could be that large companies are more internationalized; this makes their activity less dependent on the situation in the internal market (Table 4).

Speaking separately about each macro indicator, as had been expected, the correlation between the *number of population* and the profitability of SMEs was found to be statistically insignificant. This phenomenon is of crucial importance to the fact that the number of people in the country is continuously, steadily decreasing, so the correlation is a negative value, but the relationship is not statistically significant, partly because the profitability is either decreasing or increasing, while the number of people is getting smaller constantly. Therefore, it can be concluded that the lack of correlation does not mean that the population decline does not affect the company's financial performance.

Unfortunately, the effect of *foreign direct investments* on large and small businesses is not significant, especially since the bulk of FDI in Lithuania is received by large companies. The correlation is weak and has a relatively low statistical significance despite the impact of macroeconomic factors on the number of bankruptcies (Jukna, 2004); the greatest impact on bankruptcies is exerted by unemployment, FDI, changes in businesses, and the general population numbers.

The higher profitability rate showed no connection with the country's *export* and *import* dynamics. Only micro business shows a more pronounced statistical significance of imports, which confirms the results based on older studies conducted for SMEs in relation to imports; this happens due to the fact that this business segment is a more active importer than exporter. It has been found by the Observatory of European SMEs (http://ec.europa.eu) that large enterprises in the EU export much more than small ones.

As one can see in Table 4, *unemployment* has the biggest impact on profitability. It corresponds with Martinkus findings that small businesses are mostly affected among other by labour markets. The correlation is negative, which means that the rising unemployment reduces the profitability of firms. It should be also noted that this indicator is important for all groups of firms, especially for smaller companies more proactive in the internal market. The hypothesis that a high unemployment rate helps small businesses to find easier skilled labour at a reasonable price and improve their financial performance is wrong, because the correlation is not be positive.

According to the theory of corporate finance, the rising *average wages* would reduce the firm's profits, but the correlations show that for all groups of firms this effect was not statistically significant; nevertheless, it remained positive. This phenomenon can be explained by the fact that the household income growth in the internal market is more important for a business than payments in wages. Also, the explanation why there was not a negative correlation could be the rapid income growth in the of time prosperity economic and in the average salary fall in the times of crisis.

In contrast to the population, the number of enterprises in Lithuania is constantly increasing and affect the profitability of the companies by raising the level of competitiveness. Another factor that could weaken the correlation could be the rapid economic growth and the constantly expanding market, which lead to the emergence of new businesses in the market. Contrary to the integrated macro environment evaluation of transport companies which has shown that for SMEs one of the most favourable factors is the GDP growth (Žvirblis, 2007), the investigation did not show a statistically significant correlation between the GDP growth and profitability, but it can be stated that the GDP influence on the financial ratios studied is dependent as much as the profitability of companies depends on incomes, but it does not always go that way. The integrated transport companies' macro environment evaluation survey provides an evidence that before the global crisis of 2007 the correlation between GDP growth and profitability was statistically significant, and when we integrate the post-crisis data the significance does not exist.

The survey also shows that there is no statistically proven correlation for companies between the paid *taxes* and the profit. The statistics show a strong correlation only in case of micro-enterprises. In the beginning of the study, a negative result was expected, since the tax reduces profits, but the study showed a positive relationship. An increased tax burden is slightly less favourable for the large firms' profitability, because they pay the biggest part of taxes. Furthermore, the tax burden in the country is roughly the same as the fees paid directly depend on the GDP, while the yield rate is constantly changing.

Both the cash and bank deposits have a positive impact on corporate profitability, but statistically it was again not significant, contrary to the research of the Baltic countries' stock price correlation with macroeconomic indicators (Bareika, 2009) which has shown that in Latvia and Lithuania, besides other indicators, the money supply was statistically important for stock prices and reasonable for corporate profitability.

The interbank interest rate changes VILIBOR has a strong, statistically-based impact on profitability, particularly among larger companies. This can be explained by the fact that SMEs in general are less borrowing from banks (Cressy, 2004) and get preferential loans with state guarantees.

To summarize, we can confidently say that most of the selected macroeconomic indicators such as inflation, average wages, the number of enterprises, or the monetary base are not statistically significant and have no strong correlation with corporate profitability, and **the hypothesis 1** that all macroeconomic factors have a strong influence on corporate profitability has not been validated. This could be explained by the global economic crisis which influenced profitability more than these indicators.

The hypothesis 2 that unemployment, taxes, companies' number, VILIBOR rate, wages and inflation have a strong negative correlation with corporate profitability has been proven in part:: all the macro indicators show a negative correlation and only the unemployment rate shows a strong correlation, with corporate profitability.

Conclusions

1. In recent years, Lithuania devotes considerable attention to small and medium-sized companies' profitability, but research related to the evaluation of complex macro factors and their influence on the final performance of SMEs is not sufficient. Profitability is one of the most volatile company's financial indicators. It is affected not only by internal but also by the external macro factors in particular; it is most inconsistent among the smaller companies.

2. Most of the selected macroeconomic indicators such as inflation, average wages, the number of enterprises, or the monetary base were not statistically significant and showed no strong correlation with corporate profitability. Ir could be explained by the global economic crisis which influenced profitability more than these indicators.

3. The survey has also shown that there is no statistically proven correlation for companies between the paid taxes and the profit. The statistics show a strong correlation only in case of micro-enterprises. The increased tax burden is slightly less favourable for the large firms' profitability, and this can be explained by the fact that they pay the biggest part of taxes.

4. The interbank interest rate VILIBOR changes have a strong, statistically-based impact on profitability, particularly among larger companies. This can be explained by the fact that SMEs in general are less borrowing from banks and also get preferential loans with state guarantees.

5. Unemployment has the biggest impact on profitability. The correlation is negative, which means that the rising unemployment reduces the profitability of firms. It should also be noted that this indicator is important for all groups of firms, especially for smaller companies more active in the internal market. The claim that a high unemployment rate helps small businesses easier to find skilled labour at a reasonable price and improve the financial performance has failed, because the correlation should be positive.

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