

# RETURN ON EQUITY AND COMPANY CHARACTERISTICS: AN EMPIRICAL STUDY OF INDUSTRIES IN LATVIA

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## Abstract

This paper examines the relationship between return on equity and other company characteristics. These characteristics can be classified in two broad groups: ratios (return on assets, return on sales and current ratio), and capital structure ratios (total debt, long-term debt and short-term debt ratios). In addition, the ratio of tangible assets and company size were analysed.

Based on the analysis of a sample of 450 companies over the period from 2004 to 2012, it can be concluded that agriculture companies did not have volatile ROE in the period of the study, and during recession, this ratio still remained above 10%. Such situation can be explained by government policies and subsidies. Therefore, ROE of agriculture companies is not generally associated and correlated with other company characteristics. In the case of food production companies, one can find that during the recession more profitable companies have less debt (regardless of maturity). For retail companies, it can be concluded that bigger companies have a higher ROE, yet asset structure and long-term debt ratio are negatively correlated with ROE.

**Key words:** capital structure, return on assets, return on equity, return on sales

**JEL Code:** G30, G32

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## Introduction

Profitability ratios show the ability of the company to generate profit, and these ratios are used by the company, financing institutions, etc. to determine the performance of the company. Therefore it is crucial to evaluate the ratio, which is very important for company shareholders – the return on equity (ROE). For example, Warren Buffet encourages the use of ROE, and in his annual letter to shareholders, he mentions ROE 32 times over the past 20 years (Price, 2012).

The aim of the paper is to analyse the relationship between return on equity and other company characteristics and, based on the empirical results, to make conclusions and recommendations.

The analysis is conducted on a sample of 450 Latvian companies over the period from 2004 to 2012. In the research paper, the following qualitative and quantitative methods of research are applied: the monographic method, graphical method and correlation analysis. The authors analyse the relationship of return on equity with other ratios (return on assets, return on sales, and current ratio), capital structure (total debt, long-term debt and short-term debt ratios), and asset structure and company size. The research is based on published papers on return on equity, as well as information provided by Lursoft. Correlation analysis is done using the Statistical Package for the Social Sciences (SPSS).

The remainder of the paper is organized as follows. Next section provides the review of recent studies on the subject of the paper. Then, the methodology and sample of the study is discussed. After the methodology section, empirical results are described. The final section concludes the paper.

## **1 Literature review on return on equity**

ROE tells what percentage of profit the company makes for every monetary unit of equity invested in the company. ROE doesn't specify how much cash will be returned to the shareholders, since that depends on the company's decision about dividend payments and on how much the stock price appreciates. However, it's a good indication of whether the company is even capable of generating a return that is worth whatever risk the investment may entail (Berman, Knight and Case, 2013). ROE is usually calculated by dividing net profit by average shareholders' equity.

As pointed out by Herciu, Ogorean and Belascu (2011), company profits are not relevant to investors except to the extent that they relate to other indicators. Afore mentioned authors used ROS, ROA and ROE in order to identify a relation between effect and effort, where effect is profit while effort is given by either sales, total assets, or the stockholder's equity.

Econometric results suggest that lagged profitability is a significant determinant of current profit margins (McDonald, 1999). Acheampong (2000) analysed the effects of both country and company factors on the return on equity in the beverage and tobacco, and food and consumer-products industries. Panel data covered 129 companies from 1989 to 1995 in

12 industrialized countries. It was concluded that country and company factors are important in explaining variation in return on equity within countries but not generally across countries or time.

Porter (2005) analysed 31 industries and found that investment returns are highly correlated with the industry portfolio returns. In addition, it was found that the portion of investment returns orthogonal to equity returns is associated positively with changes in profitability and negatively with lagged differences between equity and investment returns.

Circiumaru, Siminica and Marcu (2010) studied a sample of 73 Romanian companies and analysed if the return on sales (ROS), the asset turnover and the financial leverage impact return on equity (ROE) by employing regression analysis. A correlation between ROS and ROE was found, however it was not observed that ROS impacts ROE. Empirical results by Kim and Kim (2010) found that there is a significant mutual Granger causality between equity returns and equity fund flows. By introducing the dividend yield effect, significant Granger causality is also found among the three variables.

Kabajeh, Al Nu'aimat and Dahmash (2012) examined a small sample (28 companies) over the period of 2002 to 2007. The results showed a positive relationship between the ROA, ROE, ROI and share prices. Nunes, Viveiros and Serrasqueiro (2012) used two samples of young SMEs and old SMEs in order to verify if age is an important factor of profitability. It was found that age, size, liquidity and long-term debt are important and positively correlated with profitability.

A recent paper (Warusawitharana, 2013) concluded that the expected returns have declined by about 3 percentage points over the past 40 years, and did forecast that the future returns on equity may be lower than past realized returns.

Overall, one can conclude that ROE is an important indicator. In addition, it is crucial to view ROE not as an isolated indicator, but also is necessary to analyse how this ratio is associated with changes in other company characteristics.

## **2 Sample and research methodology**

The study is based on the financial data collected from the financial statements of 450 Latvian companies over the period from 2004-2012. Companies represent three industries: agriculture (150 companies), food production (150 companies) and retail (150 companies). All companies had all the necessary data for the whole period analysed, therefore a balanced panel of data is achieved. Data are obtained from Lursoft data base.

The analysis is conducted using the correlation method. The Pearson correlation ratio measures the degree and direction of linear relationship between two variables. Correlation coefficient of +1 corresponds to a perfect positive linear relationship, coefficient of -1 corresponds to a perfect negative linear relationship, and 0 indicates no linear relationship between variables. The study uses book values of calculated variables.

The used variables and their calculation are indicated in Table 1.

**Tab. 1: Variables of the study**

<b>Variable</b>	<b>Measurement</b>
Return on equity (ROE)	Net profits/stockholders' equity
Return on assets (ROA)	Net profits/total assets
Return on sales (ROS)	Net profits/sales
Current ratio (LIQ)	Current assets/current liabilities
Short-term debt ratio (STD)	Short-term debt/total assets
Long-term debt ratio (LTD)	Long-term debt/total assets
Total debt ratio (TD)	Total debt/total assets
Active structure (TANG)	Fixed assets/total assets
Company size (SIZE)	Logarithm of total assets

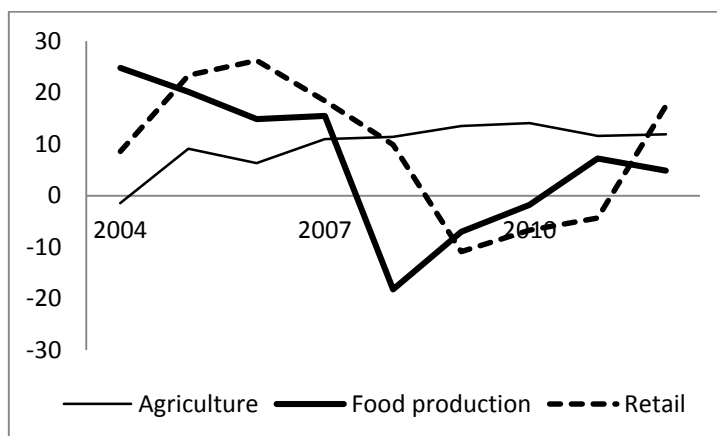
This study uses not only the total debt ratio (TD), but also the long-term debt ratio (LTD) and the short-term debt ratio (STD), since any analysis of leverage based on total liabilities may miss the important differences between long-term and short-term debt (Sogorb-Mira, 2005).

### **3 Empirical analysis and discussion of results**

ROE for all three industries included in the study is illustrated in the Figure 1. ROE dynamics can be sub-divided into two periods: pre-crisis (to and including 2007) and economic recession and recovery (from 2008 onwards). In the first period, ROE was significantly higher in retail and food production companies, yet ROE of agriculture companies was still positive. A different situation can be found for the recession period and recent years – both food production and retail industries experienced negative profitability, while agriculture companies maintained ROE slightly above 10%. One explanation why agriculture companies had a steady ROE, which did not turn negative during the recession, could be the small equity capital (if denominator is quite small, then a minor increase in the numerator can result in a high ratio). In addition, agriculture companies could have maintained a decent profitability level because of government subsidies. Therefore, agriculture companies had government support, which the other two industries did not have.

In 2012, the ROE for agriculture companies was almost 12%, for food production companies almost 5% and for retail companies this ratio was close to 17%.

**Fig. 1: ROE for the Latvian industries in the study (2004-2012)**



Source: authors' construction based on the annual reports (Lursoft, 2013)

Table 2 provides the Pearson correlation matrix of the variables included in the study for the agriculture companies. ROE is positively correlated with ROA and ROS, which can be expected, since all ratios are calculated using net profits in the numerator. However, correlation coefficients of ROE with ROA are significantly higher than correlation coefficients of ROE with ROS.

**Tab. 2: Pearson correlation matrix of the agricultural companies in Latvia, 2004-2012**

	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>ROA</b>	0.566** (0.000)	0.468** (0.000)	0.875** (0.000)	0.727** (0.000)	0.874** (0.000)	0.881** (0.000)	0.813** (0.000)	0.887** (0.000)	0.817** (0.000)
<b>ROS</b>	0.326** (0.000)	0.376** (0.000)	0.387** (0.000)	0.282** (0.000)	0.562** (0.000)	0.685** (0.000)	0.787** (0.000)	0.706** (0.000)	0.716** (0.000)
<b>SIZE</b>	-0.231** (0.006)				-0.170* (0.043)				
<b>TANG</b>			-0.272** (0.001)						
<b>LIQ</b>									
<b>TD</b>	-0.268** (0.001)				-0.178* (0.034)				
<b>LTD</b>									
<b>STD</b>	-0.290** (0.000)		-0.215** (0.009)						

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

Source: prepared by the authors of the paper.

Regarding correlations with other company characteristics, one can note that in the case of agriculture companies more significant correlations can be found in the years before the recession. In addition, correlation coefficients are quite low and it is not possible to conclude that there exists a consistent relationship between ROE and some other company characteristic.

To sum up, ROE of agriculture companies is negatively correlated with size (2004; 2008), asset structure (2006), total debt ratio (2004; 2008) and long-term debt ratio (2004; 2006).

The results of the food production companies are presented in Table 3. In the case of the food production companies, one can find similar results to agriculture companies for ROE, ROA and ROS. All profitability ratios are positively correlated and this relationship is stronger for ROE and ROA (except for the year 2008).

**Tab. 3: Pearson correlation matrix of the food production companies in Latvia, 2004-2012**

	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>ROA</b>	0.581** (0.000)	0.540** (0.000)	0.391** (0.000)	0.767** (0.000)	0.680** (0.000)	0.541** (0.000)	0.628** (0.000)	0.617** (0.000)	0.407** (0.000)
<b>ROS</b>	0.497** (0.000)	0.349** (0.000)	0.312** (0.000)	0.598** (0.000)	0.723** (0.000)	0.234** (0.10)	0.622** (0.000)	0.331** (0.000)	
<b>SIZE</b>	-0.234** (0.006)						0.200* (0.035)		
<b>TANG</b>					-0.180* (0.042)				
<b>LIQ</b>									
<b>TD</b>					-0.386** (0.000)	-0.228* (0.012)	-0.238* (0.012)		
<b>LTD</b>	0.168* (0.050)	-0.202* (0.019)			-0.212* (0.016)				
<b>STD</b>		0.196* (0.023)			-0.242** (0.006)	-0.294** (0.001)	-0.349** (0.000)		

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

Source: prepared by the authors of the paper.

Regarding correlations with other company characteristics, some difference can be found compared to agriculture companies. For food production companies, significant relationships appear at the start of the recession (in particular year 2008). Other findings can be summarized as follows:

- Size shows weak and inconsistent results. In year 2004, one can find a slightly negative relationship with ROE, whereas in the year 2010 this relation is positive. Therefore, company size is not an important determinant of ROE;
- Asset structure and ROE has a very weak and negative relationship in the year 2008;
- Liquidity is not a statistically significant determinant;
- Debt ratios (total debt ratio, long-term debt ratio and short-term debt ratio) are negatively correlated at the beginning of the recession. It means that during bad times, more profitable companies are those with less debt. Results prior to recession are mixed.

In the case of retail companies (Table 4), the same results can be found regarding profitability ratios – positive relation and higher coefficients for ROE and ROA.

**Tab. 4: Pearson correlation matrix of the retail companies, 2004-2012**

	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>ROA</b>	0.631** (0.000)	0.398** (0.000)	0.573** (0.000)	0.653** (0.000)	0.507** (0.000)	0.648** (0.000)	0.650** (0.000)	0.724** (0.000)	0.618** (0.000)
<b>ROS</b>	0.385** (0.000)	0.250** (0.006)	0.352** (0.000)	0.380 ** (0.000)	0.238* (0.012)	0.387** (0.000)	0.468** (0.000)	0.526** (0.000)	0.334** (0.001)
<b>SIZE</b>					0.227* (0.017)	0.228** (0.023)		0.291** (0.004)	
<b>TANG</b>		-0.229* (0.013)							-0.263** (0.011)
<b>LIQ</b>									
<b>TD</b>									
<b>LTD</b>					-0.317** (0.001)				-0.221* (0.034)
<b>STD</b>		0.219* (0.017)			0.203* (0.033)	-0.268** (0.007)	-0.318** (0.001)		0.318** (0.002)

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

Source: prepared by the authors of the paper.

Overall, more statistically significant relations can be observed during the second half of the studied period. Main findings can be summarized as follows:

- Size is a statistically significant determinant and there is a positive association between ROE and size. Therefore, it can be stated that, in the retail industry, bigger companies have a slightly higher ROE;
- Liquidity and total debt ratio are not statistically significant;
- Long-term debt ratio and asset structure show statistically significant correlations during two years; these relations are negative, yet coefficients are quite small;
- Short-term debt ratio shows mixed results – there are positive correlations, as well as negative ones.

Since mostly small and medium-sized companies were included in the sample, which represents three different industries, it would be advisable for future research to include macroeconomic factors as determinants of profitability. SME could be more sensitive to the general state of the economy, and these factors could help to explain the dynamics of ROE.

## **Conclusion**

The research covered companies of Latvian agriculture, food production and retail industries for the period of 2004-2012, and analysed the relationship between return on equity and other company characteristics.

Changes in ROE are similar for retail and food production industries for the period of 2004-2012. Before crisis, these industries had a higher ROE compared to agriculture companies. During the recession, this ratio plunged and became negative, whereas, in recent years, a positive tendency can be observed. On the other hand, agriculture companies had experienced a period with very low volatility of ROE. Even in recession, agriculture companies had a ratio above 10%. Two explanations can be offered – first one is technical and second one is on its merits. If a company has a relatively small equity capital (denominator), then a minor increase in profit (numerator) can result in a high ratio. Another explanation is that the government supports the industry and provides subsidies, which retail and food production industries do not have.

All three industries show similar results regarding correlations between ROE, ROA and ROS. All correlations (except one in 2012) are highly positive and statistically significant. In addition, it was observed that ROE had significantly higher correlation coefficients with ROA, compared to ROS.



Regarding industry differences on other company characteristics, it is possible to conclude that the ROEs of agriculture companies do not have statistically significant relationships with other ratios, capital structure and other characteristics. This might be due to the afore mentioned government subsidies, and as a result – distorted competition. The other two industries show more and higher correlations during the recession and this might indicate that in the pre-crisis period more attention is paid to country determinants and general condition of the economy.

Food production companies had a negative relationship between debt ratios and ROE at the beginning of the recession. It means that during bad times, more profitable companies use less debt. Retail companies show a positive relation between ROE and size in the later years, therefore, one can conclude that bigger retail companies have a slightly higher ROE.

Since the sample mostly consisted of small and medium-sized companies, which represent three different industries, it would be advisable for future research to include macroeconomic factors as determinants of profitability. SME could be more sensitive to the general state of the economy and these factors could help to explain the dynamics of ROE.

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