

Navigating Investment Waters: Uncovering the Impact of Financial Factors on Business Behavior in Small Economies

Ieva Statkevičiūtė¹, Egidijus Bikas², Viktorija Cohen³

¹Finance department, Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania

²Finance department, Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania

³Economic Policy department, Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania
ORCID 0000-0003-2566-7170

Correspondence: Viktorija Cohen, Economic Policy department, Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania.

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Abstract

Using companies listed on the Nasdaq Baltic Stock Exchange (2017–2021), we analyze the influence of financial factors on the investment behavior of businesses in small economies. We run a panel regression to examine which financial factors influence corporate investment and study how business investment is affected by the previous year's cash flow, leverage ratio, asset turnover, liquidity, and sales volume. Our findings reveal robust evidence that the level of the investment of firms is negatively affected by the leverage ratio and positively affected by the asset turnover ratio. We also find that the cash flow to asset ratio has a negative but statistically insignificant affection investment. This implies that businesses in small economies are not interested in the capital market. Companies should consider taking the leverage ratio into account and incorporating it in their investment decision-making models.

Keywords: investment behavior, financial indicators, small economies, panel regression

1. Introduction

The recurrence of significant capital market downturns raises reasonable doubts about the ability of the efficient market theory to explain these fluctuations. The theory of financial behavior refutes traditional financial theory and perfectly identifies irrationality in finance. Irrationality is most visible in investment activities. Meanwhile, investment is the most frequently cited factor for the development of a country and one of the most important activities for a company, helping it maximize its value and build investors' future wealth. It can be argued that the investment behavior of firms is the basis of economic activity as businesses, acting as profit-seeking entities, create jobs and thus raise living standards and reduce poverty. Financial investment behavior is relevant to the analysis of how firms operate; thus, it is critical to understand what internal and external factors influence the investment decisions of managers or the board.

Financial behavioral theory has existed since the 1980s and is a widely researched area that has continued to attract the interest of scholars. This is reflected in the wealth of research examining the factors that shape firms' investment behavior, such as the personal characteristics of managers, their cognitive and emotional mistakes, and the impact of industry, monetary policy, and financial performance. A company's performance is a source of sustainable economic growth, which is one of the principal factors that investors analyze in their decision-making process. A company's financial performance is also important to creditors, employees, and the government. It is argued that profitability, return on equity (ROE), asset turnover, and cash flow have a positive impact on investment for a company, while the debt-to-equity ratio, leverage ratio, and liquidity constraints have a negative impact. It is important to identify the extent to which financial ratios affect corporate investment and to analyze which ratios have the greatest impact.

This paper aims to identify which financial factors affect the investment behavior of firms in small economies. We perform a comparative and systematic analysis of scientific literature as well as carry out quantitative research. We use the financial statements of companies listed on the Nasdaq Baltic Stock Exchange to analyze the investment behavior of companies in the Baltic region. This study uses the panel regression analysis method to examine the effects of the cash flow on total assets ratio, leverage ratio, asset turnover ratio, sales, and current liquidity ratio as independent variables on the investment to asset ratio (our dependent variable) and define the interrelationships and interdependence of the variables. Panel regression combines the advantages of cross-sectional data and time series analysis techniques to provide

information on the evolution of certain groups of variables over a given period. We use the Nasdaq Baltic Regulated Marketdata from 2017 to 2021 of 25 companies on the Baltic Main List and 14 companies on the Baltic Secondary List (Table A1 in the Appendix). The results are processed using Microsoft Excel and GRETL.

The remainder of the study proceeds as follows. Section 1 provides a literature analysis on the concept of financial behavior and examines the scientific research conducted on the investment behavior of companies and the influence of financial indicators. Section 2 explains the research methodology. Section 3 analyzes the data of companies in small economies listed on the Nasdaq Baltic Stock Exchange and investigates the impact of a company's field of activity on its ratio of investments and assets and other financial indicators. Section 4 offers a detailed discussion of the results and Section 5 presents the conclusions.

2. Background and Literature

Behavioral finance theory assumes that individuals do not always act rationally (Simon, 1955), individuals asymmetrically assess their prospects of loss and gain (Kahneman&Tversky, 1979), real economic agents often deviate from the standard use of probability theory in their assessment of uncertainties, and their decisions are often inconsistent with the notion that they are always seeking to maximize expected benefit (Thaler, 1980). As businesses face numerous obstacles, such as resource constraints, market changes, and unanticipated risks (Baig et al., 2021), the financial decisions of managers are influenced by various psychological aspects. These aspects include the structure of information and the personal characteristics, beliefs, and moods of decision-makers (Shah, 2013). Therefore, investment behavior affects firm performance and is a fundamental factor in the theory of corporate finance (Baker et al., 2007).

Ahmadi et al. (2018) suggest that the effectiveness of corporate governance can be determined by a firm's cash flows. Firms with a higher level of liquidity may have more liquid assets available to finance their investments without relying on external financing (Baum et al., 2009; Xiong& Su, 2014; AL-Ardah& Al-Okdesh, 2022). As a firm's financial constraints increase, the cash flows become more sensitive. This is most typical for small companies, those with low cash flow levels, and those with poor sales growth. Conversely, the level of debt is another important determinant influencing a company's investment behavior. Firms with higher leverage adjust their investment decisions by reducing their level of investment in response to increased risk (Sarkhe et al., 2016).

Gugler et al. (2007) compare the investment behavior of firms in Anglo-Saxon and European countries. The results show that the relationship between investment and cash flow is stronger in continental Europe than in Anglo-Saxon countries among firms that are more prone to asymmetric information problems. They determine that the asymmetric information theory is characterized by several assumptions: (1) the firm does not have sufficient cash flow to finance the desired investment, or it is unable to finance the investment because it cannot increase its level of debt or reduce its dividend; (2) the firm's management is assumed to understand the possibility of a successful investment, but the firm's share price is undervalued by the market; (3) the issue of new shares to finance a new investment is not feasible because it may be to the detriment to the existing shareholders; and (4) in an effort to maximize the wealth of existing shareholders, the manager of the company excludes the possibility of investing for the benefit of the new shareholders and the company itself.

Kannadhasan (2014) studies the investment behavior of companies listed on the Bombay Stock Exchange and finds that the leverage ratio has a negative effect on investment, while cash flow and asset turnover have a positive effect. Sarkhe et al. (2016) analyze firms listed on the Tehran Stock Exchange and confirm that companies with higher debt-to-ratio tend to reduce their investments or adjust their investment decisions. In contrast, firms with higher growth potential tend to invest more than other companies. In addition, the returns of a firm, which are a proxy for firm size, reveal that larger firms have larger investments. These results suggest that companies should be encouraged to incorporate their leverage and growth opportunities into the investment decision-making models.

Bikas et al. (2013) assess investment behavior in a small economy by analyzing Lithuanian companies. Their results suggest that investment decisions are influenced by both potential returns and potential losses. According to the authors, this extends the prospect theory. Although the prospect theory focuses on individuals and not entities, corporate managers are individuals who may be more interested in relative profit and loss rather than ultimate revenues and benefits.

According to Mills et al. (1995), the general financial performance of a company influences its investment behavior. Corporate financial ratios are used for several reasons: to determine the financial situation of a company, to compare it with the industry, to predict the possible future of the company, to determine the efficiency of management, and to measure the efficiency between the company's departments. Financial ratios are also the basis for the development of bankruptcy risk models (Vintila et al., 2015).

Vintila et al. (2015) use Ward's method of factor, cluster analysis, and a regression model to analyze the financial performance of 46 listed companies on the Bucharest Stock Exchange in Romania and its determinants between 2009 to 2013. According to the results, the financial performance of Romanian firms is negatively affected by the debt-weighted

indicator and significantly positively affected by capital turnover. Moreover, the authors argue that a high level of corporate assets is neither a guarantee for the development of more investments nor an indicator of greater stability in times of crisis.

Nguyen et al. (2013) observe a tendency for firms to issue shares when the price-to-book ratio is high compared to the average historical price-to-book ratio of the firm. Investors should be cautious about contemporary issues, as newly issued shares may underperform the market average and tend to be issued when there is an upturn in a particular industry or the overall market. In addition, firms with high valuations issue more ordinary shares, while firms with low market valuations try to buy back their shares (Shah, 2013). In other words, biases that affect irrational investors may affect the timing of the issuance of securities but should not affect a firm's investment plans if the firm is stock-independent. However, the biases of irrational investors may distort the investment plans of firms that are stock-dependent (Shah, 2013). In traditional economics, investors are assumed to be immune to the framing effect, and if taxes and transaction costs did not exist, a firm's dividend policy would be irrelevant.

According to Mills et al. (1995), financial factors are usually included in standard investment models because of information asymmetries or agency conflicts. The introduction of these assumptions helps to explain how a given level of investment will be financed and how a company's financial position will affect its investments. Investors are less aware of small companies, and this may inhibit increased external financing; therefore, changes in cash flows may be a more important determinant of investments for smaller companies. In addition, investments made by highly leveraged firms may be more sensitive to cash flows than those made by less leveraged firms. The increased cost of funding that results from higher debt levels means that the cash flows available to higher leveraged firms are lower; thus, these firms have less protection against potential financial distress.

The analysis is of financial factors influencing companies' investment behavior as in regression and factor analysis and data from the financial statements of Lithuanian companies shows that in Lithuanian joint stock companies, the size of financial assets is positively influenced by profitability. The fluctuations in ROE also have a positive effect, showing that at higher fluctuations, investments vary by a factor of 0,35. However, the size of financial assets is negatively affected by two indicators: the debt-to-equity ratio and financial constraints (Bikas&Glinskytė., 2021).

The structure of a company's balance sheet and the availability of adequate internal sources of funds can influence investment. Mills et al. (1995) study the impact of financial ratios on corporate investment in Australia and find that higher leverage can discourage investment by, for example, increasing the cost of further external financing. In contrast, higher cash flows can encourage investment. According to the authors that this is because firms have more, "cheap" internal funds, which increase the firm's intrinsic value. Although both factors are statistically significant, the effect of cash flow is more economically important. These results demonstrate that internal sources of finance are more important for small companies with high leverage and for companies with high retention needs. These results are also influenced by monetary policy. First, the importance of cash flow as a determinant of investment shows that monetary policy will influence investment through cash flow, as well as through the discount rate applied to investment projects and general economic conditions. Second, the impact of monetary policy on the corporate sector is uneven. Smaller firms, firms with higher leverage, and firms more dependent on cash flow as a source of funding are likely to be more sensitive to changes in monetary policy than others, while investment behavior is less affected by financial performance among large firms or firms with low levels of debt.

Firms make optimal investment decisions and take advantage of profitable investment opportunities when sufficient financial resources are available. Based on data from Iranian listed companies on the Tehran Stock Exchange between 2011 to 2016, Ahmadi et al. (2018) study the impact of financial distress on investment behavior. Their results confirm the following: (1) firms with fewer investment opportunities are more likely to reduce their investment level and (2) firms in financial distress with more investment opportunities are more likely to increase their investment level. The inefficiency of capital markets leads to an increase in the cost of external finance and financial constraints. This leads firms to invest less due to being financially disadvantaged. However, Ahmadi et al. (2018) claim that firms that are experiencing difficulty but are in overall good economic health reduce their capital expenditure to control the situation, attempt to sell assets at low prices, do not take on risky investment projects, and increase investment when their financial situation improves. Distressed firms that earn profits from their operations are sensitive to positive cash flows; however, large firms that face difficulties and have negative operating losses showed negative cash flow sensitivity in the study. This is due to the greater availability of external financing.

Audretsch&Elston (2002) analyze how liquidity constraints affect the investment behavior of firms of different sizes by applying a regression model and using the financial statements of German listed companies. In their research scholars divide the firms into four groups according to size (number of employees). The results show that small and large firms in Germany are relatively least affected by liquidity constraints, while medium-sized firms experience the highest level of

liquidity constraints. Therefore, small and large firms are more likely to invest, while medium-sized firms are less likely to invest or may even be tempted to disinvest. Audretsch&Elston (2002) further explain that large firms have greater access to capital in the market, while small firms have greater access to borrowing not only from banks but also from savings and credit cooperatives (SACCOs); thus, large and small firms respectively enjoy access to competitively priced capital and long-term loans. In comparison, medium-sized companies are unable to borrow the necessary funds from SACCOs like small firms and are not treated favorably by banks like large firms, therefore putting them at a disadvantage.

The literature analysis suggests that scholars mainly focus on the impacts of cash flow, debt, liquidity, funding constraints, and profitability on firms' investment behavior (Table 1).

Table 1. Financial factors affecting the level of investment

Authors	Indicators with a positive impact on investment	Authors	Indicators with a negative impact on investment
Jiming et al. (2010) Sarkhe et al. (2016) Kannadhasan (2014)	Turnover of assets	Sarkhe et al. (2016) Kannadhasan (2014)	Debt ratio
Bikas&Glinskytė (2021)	Return on equity (ROE)		
Vintila&Nenu (2015)	Capital turnover	Audretsch&Elston (2002)	Liquidity constraints
Gugler et al. (2007) Mills et al. (1995) Jiming et al. (2010) Kannadhasan (2014) Sarkhe et al. (2016)	Cash flows	Bikas&Glinskytė (2021) Ahmadi &Kordloei (2018) Audretsch&Elston (2002)	Financing restrictions
Bikas&Glinskytė (2021)	Gross profitability ratio	Mills et al. (1995) Bikas&Glinskytė (2021) Bae (2009) Vintila&Nenu (2015)	Financial leverage
Jiming et al. (2010)	Tobin's Q		

Source: compiled by authors

Corporate investment is positively influenced by the gross profitability ratio, capital turnover, cashflow, ROE, asset turnover, and Tobin's Q.

The indicators most frequently cited as negatively affecting the level of investment in companies are debt-weighted ratios, liquidity constraints, and financial constraints. As financial ratio has a significant impact on investment, it is important to consider the magnitude and the evolution of this overtime. According to Baker &Wuegler (2007), firms' investment behavior has a significant impact on their business prospects. Investment behavior is influenced by several factors: the behavior of managers, chief financial officers, and boards of directors, government policies, and a company's financial situation and financial performance. Analyzing the investment behavior of companies is essential to understand how companies operate, on what basis their investment decisions are made, and how and which financial indicators lead to an increase or decrease in the level of investment.

3. Methods and Data

We apply a panel regression to examine which financial factors influence corporate investment in small economies and research how business investment is affected by the previous year's cash flow, leverage ratio, asset turnover, liquidity, and sales volume based on the methodology developed by Sarkhe et al. (2016) and Kannadhasan (2014). Inclusion of these variables is also based on a number of previous studies. For example, Mustapha &Chyi, (2012) confirm that large firms with higher cash flows may be more likely to invest. Larger companies with higher total assets typically have more

financial resources and a broader capital base to fund new investments, that provides them with a competitive advantage in investment opportunities. Additionally, firms with lower liabilities to assets ratios may be more inclined to invest (Aivazian et al., 2005; Demoussis et al., 2017; Jeenas, 2019). Firms with lower debt levels have less financial risk, thus lower financial burden and less pressure to debt obligations make firms more willing to pursue investment opportunities. Overall, it is considered that a higher assets turnover ratio is generally associated with better financial performance. For example, Manna et al. (2016) confirm positive impact of assets turnover ratio on financial performance, which suggests that the higher asset turnover ratio the more efficiently a company utilizes its assets to generate revenue. Lin et al. (2021) further suggest that high asset turnover ratio indicates efficient use of resources and reflects the effective operation of a company. Therefore, such firms are more confident in their ability to generate returns from new investments and employ certain strategies that focus on asset efficiency. Furthermore, several studies imply that firms with higher liquidity ratios may be more willing to invest (Baum et al., 2009; Xiong & Su, 2014; Al-Ardah & Al-Okdesh, 2022). High level of liquidity proposes that a company has available cash and liquid assets, which can be used for financing new projects or investments without increasing debt. Finally, there are several reasons why firms with higher sales are more likely to invest. First, higher sales demonstrate company's ability to generate revenues, that comes from a strong demand for produced goods or services (Rashid & Saeed, 2017). Second, companies with higher sales usually have high profitability, which generates financial resources for investments (Molina & Preve, 2009). Moreover, increased sales can contribute to access of external capital in the form of loans or equity financing and support investment activities (Biddle & Hilary, 2006). Furthermore, companies with higher sales may be more resilient to economic uncertainties and shocks, which can increase their confidence in willingness to invest during market uncertainties.

Given the above, we construct the following regression model:

$$\ln\left(\frac{I_{i,t}}{A_{i,t-1}}\right) = \alpha + \beta_1 \ln\left(\frac{C}{A}\right)_{i,t-1} + \beta_2 \ln\left(\frac{L}{A}\right)_{i,t-1} + \beta_3 \ln\left(\frac{S}{A}\right)_{i,t-1} + \beta_4 \ln\left(\frac{T}{D}\right)_{i,t-1} + \beta_5 \ln(S)_{i,t-1} + \mu_t + F_i + u_{i,t} \quad (1)$$

where, $\frac{I_{i,t}}{A_{i,t-1}}$ is the investment to asset ratio, the dependent variable.

The independent variables are as follows:

- $\left(\frac{C}{A}\right)_{i,t-1}$ represents the cash flow on total assets ratio,
- $\left(\frac{L}{A}\right)_{i,t-1}$ is the ratio of liabilities to assets,
- $\left(\frac{S}{A}\right)_{i,t-1}$ is the asset turnover ratio,
- $\left(\frac{T}{D}\right)_{i,t-1}$ is the liquidity ratio, and
- $(S)_{i,t-1}$ is sales, used to measure the effect of firm size on the dependent variable.

β_i is a slope. μ_t stands for the time pseudo-variable. F_i represents the time-invariant firm-specific effects. u_i represents random errors.

We next address some problems that are associated with the model. We deal with auto correlation by employing the Wooldridge test and with heteroskedasticity by executing the Koenker test (Wooldridge, 2012). To determine whether there is any dependence in the cross-sectional data we use the Pesaran test. To ascertain whether the least squares or fixed effects regression is more appropriate, the F-test is applied. The Breusch-Pagan test is used to determine whether the least squares or random effects regression is more appropriate. In addition, we employ the Hausman test to determine whether the regression should be constructed as a fixed effects or random effects model. Finally, the p-statistic test is used to represent the probability of making a first-order error using the available sample data.

We assess the investment to asset ratio, debt ratio, asset turnover, current liquidity, and sales of the 39 sample companies. Our main sources for indicators are the financial statements of companies listed on the Nasdaq Baltic Stock Exchange. Nasdaq, Inc. organizes the trading of financial instruments, and the Nasdaq Baltic platform combines the stock exchanges in Vilnius, Riga, and Tallinn. Trading on these exchanges is conducted under the same conditions, with a common listing of Baltic companies. We use data from 25 companies on the Baltic Main List and 14 companies on the Baltic Secondary List. Data from banks, other financial firms, and data from firms that did not file financial statements from 2017 onwards

are excluded. In total, data from 39 companies from 2017 to 2021 are used and shown in Table A1 (Appendix). We further process the data using Microsoft Excel and GRET. In GRET, the significance of the variables is indicated by asterisks: a 99% level of significance is indicated by three asterisks, a 95% level by two asterisks, and a 90% level by one asterisk.

4. Empirical Results

Table 2 provides a summary of the correlation results between the dependent and independent variables to determine whether there is a relationship between the financial indicators and the investment activity of firms. All independent variables have a relationship with the dependent variable.

Table 2. Correlation between the dependent variable and independent variables

Correlation between the investment to asset and:	Correlation coefficient	Connection interpretation
Cash flow on total assets ratio	0.2212	Weak
Debt ratio	-0.1184	Weak
Asset turnover ratio	0.1297	Weak
Current liquidity ratio	0.0296	Very weak
Sales	0.0966	Very weak

Source: compiled by authors

The existing relationships vary between weak and very weak, with all independent variables, except for the debt ratio, positively correlated with the dependent variable. The relationship between the investment to asset ratio and current liquidity ratio (0.0296) and the level of sales (0.0966) is very weak; therefore, the liquidity ratio and the sales are removed from the panel regression model. We further analyze the three independent variables:

- the previous year's cash flow/asset ratio,
- the debt ratio, and
- the asset turnover ratio, and their impact on the dependent variable (investment to asset ratio) from 2017 to 2021.

As the data is not stationary, we find the logarithms of the variables to avoid autocorrelated errors and heteroskedasticity in the regression model. Since the cash flow on total assets ratio is negative for certain companies, we add the lowest value of the cash flow on total assets ratio to all data. Table 3 reports the descriptive statistics of selected variables. A total of 195 data series are used in this study.

Table 3. Descriptive statistics of variables

Variable	Mean	Median	SD	Min.value	Max. value	Obs.
Investment to asset ratio	-0.991	-1.05	0.228	-1.19	0.178	195
Cash flow on total assets	-0.997	-0.985	0.282	-3.26	-0.469	195
Debt ratio	-0.315	-0.270	0.268	-1.05	0.259	195
Asset turnover ratio	0.118	0.283	0.545	-0.997	1.19	195

Source: compiled by authors

All tests in GRET are formulated so that there is no heteroskedasticity, autocorrelation, or other problems with the model being tested if the p-value is greater than 0.05. The Wooldridge test is used to determine whether autocorrelation exists in a panel regression model. If the p-value is greater than 0.05, there is no autocorrelation in the regression model and if the p-value is less than 0.05, there is autocorrelation in the regression model (Table 4).

However, if the fitted model has autocorrelation, robust standard errors can be used. In GRET, the use of a robust residual errors model eliminates the problems of heteroskedasticity and autocorrelation in regression. The program performs two types of error regression adjustment: Arellano and PCSE. Arellano is used when the model has both autocorrelation and heteroskedasticity, while PCSE is used when the regression has only heteroskedasticity (Čiegis et al., 2020; Geneliene, 2022). In this case, autocorrelation is weak and positive; thus, Arellano correction is applied to the final regression model.

Table 4. Autocorrelation test

Wooldridge test				
t (37)	8.58285			
p-value = P (t > 26,2012)	1.99308e-10			
	Coef.	Stand. deviation	t-ratio	p-value
uhat(-1)	0.607312	0.0707588	8.583	1.99e-010

Source: compiled by authors

Since the regression does not follow a normal distribution, the Koenker test is applied in Table 5 to determine whether heteroskedasticity exists in the panel regression model. The p-value obtained by the Koenker test equals 0.64843, indicating that the data used in the model are homoscedastic and that the variance of errors is constant. We test the dependence of the cross-sectional data using the Pesaran CD test. Given that p-value equals 0.128, we conclude that there is no cross-sectional dependence in the regression.

Table 5. Heteroskedasticity and cross-sectional data dependence tests

Koenker test	
LM	13.312841
p-value = P (Chi square (7) >13,312841)	0.064843
Pesaran CD test	
Z	1.520646
p-value = P (z >1,52065)	0.128

Source: compiled by authors

In the next step, we determine which panel regression model should be used: least squares, fixed effects, or random effects (Table 6). The F-test allows us to determine which model, least squares or fixed effects, is more appropriate for panel regression. If the p-value is less than 0.05, the fixed effects model is more appropriate for panel regression. The Breusch–Pagan test helps to determine whether a least squares or a random effects regression model is more appropriate for regression. This test determines that the random effects model is more appropriate for the model, as the p-value is less than 0.05. Since the results of the tests indicate that different models should be used, the Hausman test is applied to answer the question of whether a fixed effects or a random effects model should be used. The p-value obtained is less than 0.05, indicating that a fixed effects model should be used to construct the panel regression.

Table 6. Fixed Effects and Random Effects Test

Test for joint significance between groups	
F (38. 149)	7.00143
p-value	1.79644e-018
Breusch–Pagan test	
LM	65.1544
p-value= prob (Chi square (1) >297.381)	6.92552e-016
Hausman test	
H	65.8383
p-value = prob (Chi square (3) >34.1196)	1.86929e-007

Source: compiled by authors

We construct the following final panel regression model (Table 7):

Table 7. Final panel regression model

Variable	Coefficient	SD	z	p-value	Level of significance
Constant	-1.22132	0.0937497	-13.03	<0.0001	***
Cash flow on total assets ratio	-0.0161452	0.0378484	-0.4266	0.6697	
Debt ratio	-0.624294	0.212868	-2.933	0.0034	***
Asset turnover	0.283722	0.168748	1.681	0.0927	*
2018	-0.0163596	0.0373486	-0.4380	0.6614	
2019	-0.0434414	0.0397451	-1.093	0.2744	
2020	0.000761141	0.0351039	0.02168	0.9827	
2021	-0.0228824	0.0264283	-0.8658	0.3866	
R²	0.300229				
p-value	0.0350449				

Source: compiled by authors

Levels of significance: *** denotes 99%, ** denotes 95%, and * denotes 90%

Table 7 shows that the estimated coefficient of determination (R^2) is greater than 25, suggesting that the model is appropriate and explains approximately 30.03% of the dispersion of business investment. The fit of the model is also supported by the p-value, which is less than 0.05, suggesting that there is at least one statistically significant variable.

According to the panel regression model, not all independent variables are statistically significant. The p-value for the independent variable, cash flow on total assets ratio, is greater than 0.05 and the significance level is not statistically significant. Thus, we can conclude that cash flows in Nasdaq Baltic listed companies do not have a significant impact on investments. The time pseudo-variables show that the investment to asset ratio of companies in the Baltic region has not been statistically significantly affected by the economic situation or other external factors in 2017–2021.

The significance level of the debt coefficient in the regression model is 99% and the p-value is less than 0.05; therefore, it is statistically significant. An increase of 1% in the independent variable, the leverage ratio, would lead to a corresponding decrease in the investment to asset ratio of 0.62%. The results suggest that the investment behavior of firms is influenced by the leverage ratio. The level of significance of the asset turnover ratio in the regression model is 90% and the p-value is above 0.05, which makes it statistically significant; however, the effect on the ROA ratio of firms is not strong. For the independent variable, asset turnover, a 1% increase in the asset turnover ratio would lead to a corresponding increase in the investment to asset ratio of 0.28%. The results of the analysis suggest that firms' investment behavior is influenced by the asset turnover ratio.

We next construct a final panel regression model indicating the relationship between the investment to asset ratio and the leverage ratio and the asset turnover ratio of firms listed on the Nasdaq Baltic Stock Exchange.

$$\ln\left(\frac{I_{i,t}}{A_{i,t-1}}\right) = -1.22132 - 0.624294 \times \ln\left(\frac{L}{A}\right)_{i,t-1} + 0.283722 \times \ln\left(\frac{S}{A}\right)_{i,t-1} + \mu_t + F_i + u_{i,t} \quad (2)$$

In summary, the level of investments of listed companies on the Nasdaq Baltic Stock Exchange is negatively affected by the leverage ratio and positively affected by the asset turnover ratio, which reflects growth potential. However, the latter indicator has a weak effect. Cash flows have no statistically significant effect on the level of investment. The correlation of the current liquidity ratio with the investment to asset ratio is very weak and therefore the impact of this indicator has not been examined. Sales, which refer to the size of the firm, show that in the Baltic region, the size of a firm does not have a significant correlation with the level of investment; therefore, this independent variable is also not included in the regression model analysis.

5. Discussion of Results

Table 8 presents the results of the study on the investment behavior of firms in the Baltic region, which differ from the effects reported in the extant academic literature. However, the leverage ratio and the asset turnover ratio have an impact on investment behavior, which is consistent with findings in the literature.

Table 8. Fixed Effects and Random Effects Test

Investment to asset ratio	Effects reported in the scientific literature	Effects identified in the study
Cash flow on total assets ratio	Positive	Negative (Statistically insignificant)
Leverage ratio	Positive	Negative (Statistically significant)
Asset turnover ratio	Positive	Positive (Statistically significant)
Sales	Positive	Not included in the regression model (Very weak positive correlation)
Current liquidity ratio	Positive	Not included in the regression model (Very weak positive correlation)

Source: compiled by authors

Since the panel regression model explains 30% of the dispersion of business investment, we conclude that the remaining 70% of the investment behavior of businesses in the Baltic region is influenced by certain external factors. These factors include government policies, the global economic condition, and the personal characteristics of company executives, boards of directors, and chief financial officers. The observation that a rise in the leverage ratio leads to a decline in the investment to asset ratio of companies may indicate that company managers and other individuals accountable for a company's financial performance are exposed to the loss aversion effect. Nevertheless, it is imperative to acknowledge that this proposal was not incorporated into our model and therefore requires additional testing. The increase in investment returns accompanied by rising debt levels tends to evoke more frustration than joy. The phenomenon could potentially be linked to an over-optimism bias exhibited by individuals responsible for making investment decisions within companies, *as the economic upturn has seen an increase in the investment-to-asset ratio at Vilniausbaldai, SAF technikos, Rokiškiosūris, Grigeo, Klaipėdos Petroleum, and other companies.*

The illusion of control bias is apparent but has not been empirically tested and validated in the public utilities industry. The escalation of electricity and gas prices has resulted in a rise in the asset turnover ratios of companies. The increase in asset turnover in the previous year was followed by an increase in investment to asset ratio in the following year, *as seen in Ignitis Group, LITGRID, and KaunoEnergia.* Decision-makers involved in investment within companies may potentially underestimate the overall market impact, as they believe they have greater control over the situation than is actually the case. Given the significance of the debt ratio and the asset turnover ratio, it can be inferred that a narrow framing effect may be present. Corporate managers and chief financial officers often overlook alternative financial indicators and fail to assess investment opportunities when drawing up the company's budget. The framing effect occurs when attention is directed towards a limited number of financial indicators, rather than considering the overall financial state.

We used Sarkhe et al.'s (2016) and Kannadhasan's (2014) methodologies to investigate the investment behavior of firms to assess the impact of financial ratios on firm investment. Sarkhe et al. (2016) analyze the impact of the financial ratios of firms listed in the Tehran Stock Exchange from 2007 to 2013 on their investment performance in the previous year. After excluding banks and other financial institutions, a fixed effects panel regression model was constructed by applying goodness of fit and significance testing procedures. Their results show that the model explains 30 % of the variance of business investment. The liquidity ratio in Sarkhe et al.'s (2016) study is statistically significant, with a positive impact on business investment. The effect of the sales indicator on investment is found to be positive and statistically significant, implying that firm size has an effect, and in Iran, large firms tend to invest more. The cash flow on total assets ratio is statistically insignificant and negative.

Kannadhasan (2014) analyzes the investment behavior of firms listed on the Bombay Stock Exchange. The study uses data from firms (excluding banks and financial institutions) for the period 2000–2011 and analyzes the impact of the

previous year's leverage ratio, asset turnover, and cash flows on a firm's investment behavior. The author constructs three models using panel regression: least squares, fixed effects, and random effects. The use of different models reveals different results. The least squares and random effects models explain 8% of the dispersion of firms' investments, while the fixed effects model explained 24%. Kannadhasan's fixed effects model finds that Bombay firms' investment behavior is positively influenced by the cash flow-to-assets ratio and the return on assets. The leverage ratio has a negative effect.

Our research results are consistent with those of studies carried out by theorists. Our results suggest that the investment behavior of companies in the Baltic region is negatively influenced by the leverage ratio and positively influenced by the asset turnover ratio. The effect of the cash flow-to-assets ratio on the investment behavior of Nasdaq Baltic listed companies is consistent with the effect found by Sarkhe et al. (2016). Liquidity has a positive, statistically significant effect on investment in the literature, but the correlation of the Baltic region's investment-to-asset ratio with this indicator was very weak; therefore, the indicator was not included in the regression. The effect of sales, which reflects the size of a firm, also differs from that found by Sarkhe et al. (2016) and Kannadhasan (2014). In the Baltic region, firm size does not have a significant impact on firms' investment decisions. The panel regression model explains 30% of the dispersion of business investment, suggesting that in the Baltic region, the investment decisions of firms are driven by the small size of the market, cultural factors, and the characteristics of decision-makers. Those in charge of financial decision-making within organizations, including directors, chief financial officers, and the board of directors, are significantly impacted by biases, leading them to make investment decisions that are not necessarily rational, despite being informed by financial ratios. The biases encompass the loss effect, over-optimism, the illusion of control, and narrow framing.

6. Conclusions

In this paper we analyze the influence of financial factors on the investment behavior of businesses in small nations. Our literature review analysis proposes that companies' financial decisions are influenced by range of factors, including resource constraints, market changes in the industry or the economy, and anticipated risks. Financial variables, such as liquidity, leverage, sales, and profitability are key determinants of the investment behavior. These variables influence a firm's capacity to invest, the level of risk companies are willing to take and their overall investment strategy. Additionally, such external factors, including monetary policy, financial performance of the overall economy and industry can further shape these decisions. Understanding this relationship is important, particularly in assessing a firm's financial health and its ability to seize investment opportunities while managing uncertainties.

Using Nasdaq Baltic Stock Exchange data on listed companies from 2017 to 2021 we study how financial factors impact the investment behavior of businesses in small economies. Through panel regression, we examine the influence of financial factors on corporate investment. Our results indicate that firm investment levels are negatively impacted by the leverage ratio and positively influenced by the asset turnover ratio. Additionally, we found that the cash flow to asset ratio has a negative, statistically insignificant impact on investment, suggesting that businesses in small economies may not be interested in the capital market. Therefore, it is important for companies to consider the leverage ratio and integrate it into their investment decision-making models.

Our results show that the investment-to-asset ratio is positively influenced by the asset turnover ratio. For companies in the Baltic region, a 1% increase in this ratio would lead to a 0.28% increase in the investment-to-asset ratio. This implies that companies should pay careful attention to their asset turnover ratio, which reflects growth opportunities.

The results further indicate that the cash flow on total assets ratio has a negative but statistically insignificant effect on investment. The liquidity ratio was not included in the regression model because its correlation with the investment-to-asset ratio was very weak. Sales, which indicate the impact of company size on investment in the Baltic region, also showed a very weak correlation with the level of investment. This indicates that companies in the Baltic region are not interested in the capital market.

Additionally, results suggest that investment behavior of firms in the Baltic region is influenced by human factors. The statistically significant impact of two financial indicators on the level of investment in firms may indicate that individuals making investment decisions in firms are influenced by a narrow framing effect. This effect causes decision-makers to overlook the company's overall financial situation, neglect to evaluate potential investment opportunities, and concentrate on only a few aspects. Upturns in corporate revenues lead to higher levels of investment and prosperity. This often leads corporate investment decision-makers underestimate the overall market impact, fostering a belief that they possess greater control over the situation than they actually do.

To reduce the impact of behavioral biases, it is advisable for managers and board members to take into account the company's the overall financial position and to conduct a thorough assessment of the investment strategy and market conditions when formulating the company's budget. Additionally, individuals responsible for investment decisions within companies should possess a comprehensive understanding of financial behavior, highlighting the need for further direction of research in this field.

This study makes a valuable contribution by providing insights into the existing literature on the relationship between financial variables and investment behavior in small economies. The findings provide insight into the influence of cognitive biases on decision-making and presents recommendations for businesses to improve their investment strategies and financial decision-making processes. The results of this study could be beneficial for researchers and practitioners in the fields of finance and economics.

Author contributions

IS conceived the study and was responsible for the design and development of the study. EB, IS was responsible for data collection data interpretation. VC and EB were responsible to double check data interpretation and the results. VC oversaw the revisions of both the first and second drafts of the manuscript. VC was responsible for proof-reading services. All three authors commented on previous versions of the manuscript. All three authors read and approved the final manuscript.

Statements and Declarations

The authors do not have any competing financial, professional, or personal interests from other parties. We confirm that this manuscript has not been published elsewhere and is not under consideration by another journal.

All authors have approved the manuscript and agree with its submission for consideration for publication in Review of European Studies.

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Appendix A. Data on the sample companies in the study

Company	Area of activity
MAIN LIST OF THE BALTIC REGULATED MARKET	
Aprangajmonė	Retail sale of clothing
AUGA group	Agriculture
Baltika	Retail sale of clothing
EkspressGrupp	Media
Grigeo	Basic material: Basic resources
HansaMatrix	Technology
Harju Elekter	Industrial products: Industrial goods and services
Ignitisgrupė	Utilities
Klaipėdosnafta	Industrial products: Industrial goods and services
Linas Agro Group	Consumer goods: Food, beverages, and tobacco
MerkoEhitus	Industrial goods: Construction and materials
Nordecon	Industrial goods: Construction and materials
Panevėžios tatybostrestas	Industrial goods: Construction and materials
Pieno žvaigždės	Consumer goods: Food, beverages, and tobacco
PRFoods	Consumer goods: Food, beverages, and tobacco
Pro KapitalGrupp	Real estate
Rokiškios ūris	Consumer goods: Food, beverages, and tobacco
SAF Technika	Telecommunications
Silvano Fashion Group	Discretionary consumption: Consumer goods and services
TallinkGrupp	Discretionary consumption: Travel and leisure
Tallinna Kaubamaja Grupp	Discretionary consumption: Retail trade
Tallinna Sadam	Industrial products: Industrial goods and services
Tallinna Vesi	Utilities
Telia Lietuva	Telecommunications
Vilkyškių pieminė	Consumer goods: Food, beverages, and tobacco
SECONDARY LIST OF THE BALTIC REGULATED MARKET	
Amber Grid	Energy
Amber Latvijas balzams	Consumer goods: Food, beverages, and tobacco
INVL Baltic Real Estate	Real estate
Kauno energija	Utilities
Latvijas Gāze	Utilities
Latvijas Jūras medicīnas centrs	Healthcare
LITGRID	Utilities
Nordic Fibreboard	Discretionary consumption: Consumer goods and services
Siguldas ciltslietu un mākslīgās apsēklošanas stacija	Consumer goods: Food, beverages, and tobacco
Snaigė	Discretionary consumption: Consumer goods and services
Utenos trikotažas	Discretionary consumption: Consumer goods and services
VEF	Real estate
Vilniaus baldai	Discretionary consumption: Consumer goods and services
Žemaitijos pienas	Consumer goods: Food, beverages, and tobacco

Source: based on Nasdaq Baltic data

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