

# The Assessment of Financial Performance of the Lithuanian Dairy Sector's Listed Companies

The article analyses the Lithuanian dairy sector companies' financial performance and its determinants. Economic value added (EVA) is employed in the paper as a measure of financial performance and labour productivity, revenue from exporting, gross profit margin and cost of debt are used as independent variables to identify determinants influencing performance. The results of the analysis show that EVA (as financial performance measure) fluctuates during the periods and has an opposite trend direction in some periods for some companies. The revenue from exporting and gross margin are found to have a significant positive impact on EVA (financial performance measure).

**Keywords:** financial performance, financial performance measurement, Economic Value Added (EVA), labour productivity, profitability, gross profit margin, revenue from exporting, cost of debt.

Straipsnyje analizuojama Lietuvos pieno sektoriaus įmonių finansinė veikla ir ją lemiantys veiksnių. Finansinė veikla matuoja pagal Ekonominių pridėtinės vertės (EVA) rodiklį, darbo jėgos produktyvumą, pajamas iš eksporto, bendrajį pelningumą ir skolos kaštus – kaip nepriklausomus kintamuosius, veikiančius finansinę veiklą. Analizės rezultatai parodė, kad EVA (kaip finansinės veiklos rodiklis) svyruoja tiriamuoju laikotarpiu ir tam tikru metu tam tikrose įmonėse jai būdingas priešingas tendansas. Nustatyta, kad pajamos iš eksporto ir bendrasis pelningumas turi reikšmingą teigiamą poveikį EVA (finansinės veiklos rodikliui).

**Raktiniai žodžiai:** finansinė veikla, finansinės veiklos vertinimas, ekonominių pridėtinės vertė (EVA), darbo našumas, pelningumas, bendrasis pelningumas, finansinės veiklos veiksnių, skolos kaštai.

## Introduction

This research paper deals with financial performance as a phenomenon observed in the field of corporate finance. From the day the first corporations and companies were established they had an important task of assessing how well they are doing

their activities, how efficiently they manage their resources, are they profitable or are they not. Different methods, methodologies and valuation measures were employed to provide a sufficient overview of the company's performance. Today, in the global economy with many advanced industries expanding and developing

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Asta KAMANDULIENĖ – PhD, lecturer at the Faculty of Economics and Management, Vytautas Magnus University, Lithuania. Address: S. Daukanto str. 28, LT-44248, Kaunas, Lithuania. Phone: +370 37 327856. E-mail: asta.kamanduliene@vdu.lt

Žilvinas KULBOKAS – MBA from the Faculty of Economics and Management, Vytautas Magnus University, Lithuania. Address: S. Daukanto str. 28, Kaunas, Lithuania. E-mail: zilvinas.kulbokas@vdu.lt

throughout the world, with many investors eager to invest and to earn a return, the techniques to measure financial performance as such pose major challenges as the world of business becomes more sophisticated than ever. Both from the investor's point of view and corporate financier point of view, the dimension of financial performance is very important and competition among companies as well as investors pursuing investment opportunities only enhances that. Everyone wants to see companies be splendid financial performers, investors want to see their returns growing which is not possible without the company being financially successful, creditors also want companies to be financially strong as only then they can be guaranteed that their loans will be repaid. It all leads to the issue of financial performance and this research paper addresses it. Throughout the years financial performance measures have developed significantly from simple financial ratios to more sophisticated measures. These are important to understand and assess evaluating their value and applicability in the modern economy. The companies could be characterized by different features such as management structure, size, capacity, profitability, productivity, capital structure, etc. All the characteristics influence financial performance at a different level. According to the previous research in this field (Malichova, 2015, Erdogan et al., 2015; Orayo, Ombaba, 2018; Shahzad, Sharfman, 2017, Kosalathevi, 2013, Markauskas, Sabonienė, 2015), there were attempts to measure financial performance, to exclude the most important determinants and to identify their impact. This research paper focuses on financial performance measure – Economic Value

Added (EVA) and financial performance determinants, and thus, following the previous studies, constructs the methodology and applies it to the Lithuanian dairy sector's listed companies. The dairy sector is one of the most complicated agrobusiness field, as it is highly influenced by price fluctuations and the competitive market for raw materials. At the same time, the dairy sector is involved in contentious politics as it is one of the main branches in the food industry and a battleground for *competing for vested interests*. The sector with an annual turnover of 1.5 billion EUR, in 2015 accounted for 27.4% of total output in the Lithuanian food industry while exports of dairy products of Lithuanian origin amounted to 430 million EUR, which constituted 3.2% of total exports of goods of Lithuanian origin. So, 95% of Lithuanian milk production is concentrated among five milk processors.

**The research problem** is formulated as: How to measure companies' financial performance and what are the determinants influencing it?

**The research aim** is to assess the financial performance of the Lithuanian dairy sector's companies listed in Nasdaq Baltic and to identify its determinants.

**The research methods:** a comparative and critical analysis of literature is conducted followed by first-difference (FD) estimations, for the empirical part of the research, which are obtained by running pooled OLS regression. This research paper introduces and presents the research done in the field of financial performance. The developed methodology is applied to the Lithuanian dairy sector (four main companies listed on Nasdaq Baltic are chosen). The research covers 15 years span from 2004 to 2018 with necessary

data taken out of annual financial statements of the companies analysed.

## Financial performance and its measurement

The concept of financial performance does not seem to be often presented in the research papers and this seems to be for a reason. It appears that the concept is not easily defined and structured causing some uncertainties and confusion among scholarly papers. Researchers (Richard et al., 2009) claim that the majority of research carried in the field of financial performance lacks a clear definition of performance as such and thus argues that this limitation together with ensuing methodological inconsistencies renders comparability of papers in the field and recommendations they profess improperly justified. Financial performance as a target of research is common, still, its definition and structure are rarely specified (March, Sutton, 1997). It seems that because of the great uncertainty surrounding the question of what is it that performance encompasses, it is often avoided for specific and clear concepts as well as structures of performance to be presented. Nevertheless, it is particularly because of these reasons for research to be consistent and properly framed that a definition should be put forward. Generalizing the ideas of scholars who do venture into defining the concept of performance in the organizational context (Santis, Albuquerque, Lizarelli, 2017; Okoshi, Pinheiro de Limab, Gouvea Da Costab, 2019; Kasie, Belay, 2013), it can be said that financial performance is the way an organization conducts its operations, it is the outcomes an organization produces

through engaging in the set of activities of particular goals and objectives. Financial performance explains how these sets of goals and objectives of an organization are achieved, what is the efficiency of pursuing the outcomes, and what are the overall results.

Financial performance has been a focus of many previous researches. Different research papers employ different methodologies and indicators that help evaluate the company's performance. The choice of these methodologies and indicators often depends on the researcher's particular interest and limitations. Various research frequently endeavours to explain the variation of chosen indicators or indicators with respect to the company's performance. Replications of these research sometimes lead to different results and conclusions and this could happen because of certain limitations of previous research could have been overcome, also sampling and assumptions might have been changed for replicative research which could have impacted the outcomes.

To evaluate financial performance there are traditional financial measures used such as ROA, ROE (Malichova, 2015; Orayo, Ombaba, 2018), net profit margin (Erdogan et al., 2015) and non-financial measures such as Tobin's q ratio, corporate social performance, CSP measure (Shahzad, Sharfman, 2017). Besides traditional financial performance measurements based on accounting ratios, modern financial measurements focusing on shareholder value are wildly applied (Popa, Mihailescu, Caragea, 2009). These value-based performance measures contrary to more traditional or classical measurements focus mostly not on net profit, but on whether the company

was able to create real economic profit (Fayed, Dubey, 2017). The Value-based performance measures include measures such as Shareholder Value Added (SVA), Economic Value Added (EVA), Economic Profit (EP), and Cash Flow Return On Investment (CFROI) (Popa et al., 2009). They have all become very popular, are wildly used and researched, but perhaps the best known of these measures as well as mostly applied is the Economic Value Added (EVA), which has also been extensively researched by various scholars (Popa et al., 2009; Maditinos, 2009; Kosalathevi, 2013; Fayed, Dubey, 2017; Makuténaitė, Gliaubicas, Makuténienė, 2013; Markauskas, Saboniene, 2015, etc.).

Following the suit of previous research concentrating on value-based performance measures, this research takes Economic Value Added (EVA) indicator as a financial performance measure in order

to identify how these dairy-producing companies operating in a highly competitive and contentious sector creates value and sustains competitive edge that allows to retain the financial health of these companies.

It is obvious that companies or investors who have a stake in the company through acquiring shares are in most cases concerned with shareholder value maximization. It is then that the ultimate goal of the company's existence, arguably, is reached. As shareholders are not only the owners but also the biggest beneficiaries of the outcomes the company is able to achieve. This yet again, arguably, is best captured by Economic Value Added (EVA). This measurement takes into account the cost of equity and evaluates what value is created after this is accounted for. This is particularly of interest to shareholders as well as potential investors

**Table 1. Summary of research on the determinants of financial performance**

Authors	Study period	Sector	Results
Paneta, Gligor and Anis (2013)	1999-2012	Industrial sector	Size, capital intensity and human resources – <b>positive</b> relationship. Company's growth and corporate social responsibility – <b>insignificant effects</b> .
Abbas, Bashir, Manzoor and Akram (2013)	2005-2010	Textile sector	Leverage, size, risk, non-debt tax shield – <b>positive</b> relationship. Growth – <b>negative</b> relationship.
Khan, Nouman and Imran (2015)	2008-2012	Financial sector	Leverage, size – <b>positive</b> relationship. Tangibility – <b>negative</b> relationship.
Markauskas and Sabonienė (2015)	2013-2015	Dairy sector	Gross profit margin – <b>positive</b> relationship and loan interest rates <b>negative</b> relationship. Market share, income from exporting, milk purchase price in the market and labour productivity – <b>insignificant effects</b> .
Singh, Misra and Tiwardi (2019)	2009-2017	Agricultural sector	Size, capital intensity, and financial performance with profitability – <b>negative</b> relationship. Growth – <b>positive</b> relationship.

Source: compiled by the authors.

to evaluate how effectively and how much of a return a company is capable of returning. This then can be compared with other investment possibilities also at the same time evaluating the risks associate with these investments. As the pioneer of EVA Stern Stewart (1991) argues "Earnings, earnings per share, and earnings growth are misleading measures of corporate performance" and that "The best practical periodic performance measure is EVA" (Stewart, 1991).

### Literature review on the determinants of financial performance

The assessment of determinants of financial performance allows companies to understand the factors they should concentrate on in order to enhance financial performance. The research on these factors indicates that there are various determinants of financial performance as well as proxies for financial performance measures themselves. However, from the literature review, it is clear that mostly financial performance determinants depend on the characteristics of specific sectors, as the research on the subject is analysing those factors that pertain to specified sectors or industries as indicated in the respective research papers. The main research results are summarized in Table 1. A number of researches have been done regarding how different determinants affect the financial performance of various companies in different industries (Malichová, Ďurišová, 2015; Erdoğana, Erdoğanb, Ömürbekc, 2015; Carton, 2004; Selvam et al., 2016, etc.). As the majority of research papers on determinants of financial performance

are conducted in different sectors, varying results are yielded.

One of these research (Markauskas, Sabonienė, 2015) evaluates factors that affect the value of the Lithuanian dairy industry. More specifically, the research attempts to evaluate the factors affecting the values of Economic Value Added (EVA) taking into account the main economic factors such as gross profit margin, the prime cost of purchased milk, productivity per employee, export, interest rates, and market share. The analysis shows that two principal factors affect Economic Value Added of dairy producing companies in Lithuania, namely gross profit margin and loan interest rates. Gross profit margin is found to have a positive linear correlation and loan interest rates to have a negative linear correlation with the Economic Value Added variable. Regression analysis reveals that the gross profit margin and loan interest rate are highly significant whereas companies' market share and income from exporting have moderate significance. However, the milk purchase price in the market and labour productivity are identified as having no significant effect on Economic Value Added regarding the companies analysed. The trend analysis employed in the research forecast that Economic Value Added values should rise for the given companies as pertaining to the forecasted future period.

A study by M. K. Khan, M. Nouman and M. Imran (2015) analysed determinants of the financial performance of the financial sector taking the time period for the research from 2008 to 2012. The results of the study indicated that leverage, size and tangibility have a significant effect on financial performance in this sector. In this research, Economic Value

Added is taken as a measure of financial performance. The results of the study suggest that financial sector performance and Economic Value Added are significantly related.

Another study (Paneta, Gligor, Anis, 2013) also, analysed economic determinants of financial performance. The study concentrated on industrial companies listed in the Bucharest Stock Exchange and involved the period of 1999 to 2012. The research found that with regard to positive influencers on financial performance, the company's size, capital intensity and human resources were statistically significant. On the other hand, the company's growth and corporate social responsibility were found to have no effect.

The research by S. A. Mirza and A. Javed (2013) analysed the determinants of the financial performance of non-financial companies from 2007 to 2011. The study validates the proposition of certain indicators affecting financial performance. More specifically, ownership structure and risk management are found to be statistically significant in affecting financial performance taking a return on equity as a performance measure.

Another research (Singh, Misra, Tiwari, 2019) analysed the financial performance of agricultural cooperatives and attempted to indicate the determinants of their performance for the period of 2009-2017. The study found that there is a negative relationship between size and profitability, meaning that small agricultural cooperatives usually earn a higher rate of return on assets than large asset rich cooperatives. The return on equity (ROA) is taken as a measure of financial performance in this research. Growth is

indicated as having a positive impact on performance, while capital intensity and financial performance are found to have a negative relationship.

The study by A. Abbas et al. (2013) researched the determinants of the company's financial performance in the textile sector between 2005 and 2010. Profitability was taken as a measure of financial performance analysing how it is influenced by various factors, namely leverage, growth, company's size, risk, tax, tangibility, liquidity and non-debt tax shield. The research shows that the company's financial performance is significantly affected by short term leverage, size, risk, tax, non-debt tax shield, however, in the long term perspective leverage and tax factors affecting financial performance become insignificant. The proxy for the financial performance measure in this research is the return on investment (ROI).

In summary, it is clear that certain determinants can be statistically significant in certain industries and sectors while others might be insignificant in others. Thus, for selecting determinants of financial performance it is essential to select determinants that could be justified being relevant in respective sectors because only then the most accurate result could be expected. Nevertheless, certain determinants analysed seems to be the same throughout different sectors, for instance, size and leverage have a significant positive relationship on financial performance in the majority of sectors. On the other hand, it does not give ground for including these determinants in every sector as relevant, nevertheless, data limitation always hinders the optionality of possible determinants which can be included. In this research paper following the previous

studies (Markauskas, Sabonienė, 2015) four determinants are selected to test the significance of the impact on financial performance (labour productivity, revenue from exporting, gross profit margin, cost of debt).

## Research methodology

The research aims to evaluate the financial performance of Lithuanian dairy sector companies and to analyze its influencing determinants. The empirical part of this research adapts the econometric model employed by M. Markauskas and A. Sabonienė (2015) extending the time frame of the research and adjusting for the independent variables. That is the dependent variable of financial performance measure - Economic Value Added (EVA), is regressed against the chosen independent variables. Therefore, for this research, there are 4 cross sectional unit and 15 years times series dimensions. Accordingly, the following multiple regression model is employed:

$$Y_n = b_1 * x_{n1} + b_2 * x_{n2} + b_3 * x_{n3} + b_4 * x_{n4} \quad (1)$$

Following previous research in the equation (1)  $Y_n$  indicates the dependent variable of company's Economic Value Added (EVA) and the following variables indicate the independent variables which are assumed in this research to affect the Economic Value Added (EVA):  $x_{n1}$  – labour productivity,  $x_{n2}$  – revenue from exporting,  $x_{n3}$  – gross profit margin,  $x_{n4}$  – the cost of debt. Table 2 below shows the calculation method for each research variable.

The calculation of labour productivity is done by dividing absolute annual revenue by average annual number of workers in the company; income from exporting is received by subtracting the revenue generated in the Lithuanian market from total revenue; the gross profit margin is calculated as net sales subtracted by the cost of goods sold and divided by net sales; the cost of debt is taken as total debt divided by total interest expenses over one year period.

*Table 2. Calculations of research variables*

Variables	Calculation
Dependent variable	
$Y_n$ - Economic Value Added	$EVA = NOPAT - (TCE \times WACC)$
Independent variable	
$x_{n1}$ - Labor productivity	(annual revenue)/(average annual number of workers in the company)
$x_{n2}$ - Revenue from exporting	total revenue - the revenue generated in the Lithuanian market
$x_{n3}$ - Gross profit margin	(net sales - cost of goods sold) / (net sales)
$x_{n4}$ - Cost of debt	(total debt) / (total interest expenses)

Source: compiled by the authors.

For this research, the economic value added (EVA) is taken as a financial performance measure with the goal to identify the determinants that affect the values and their variations. To introduce Economic Value Added (EVA) and understand the inner workings behind EVA methodology, the technical aspects of EVA are discussed. It can be calculated in the following way:

$$\text{EVA} = \text{NOPAT} - (\text{TCE} \times \text{WACC}) \quad (2)$$

Where,

NOPAT = Net operating profit after tax

TCE = Total capital employed

WACC = Weighted average cost of capital

In calculating EVA capital employed is calculated as equity added with long-term debt, alternatively known as loan funds. For the weighted average cost of capital (WACC) cost of debt is taken as after-tax cost and cost of equity is measured based on the capital asset pricing method. Under the capital asset pricing model, cost of equity ( $K_e$ ) is calculated by the following formula:

$$K_e = R_f + b_i (R_m - R_f) \quad (3)$$

Where,

$R_f$  = Risk free return

$R_m$  = Expected market rate of return

$b_i$  = Risk coefficient of a particular investment

As an indicator of risk free return, most research take government bonds returns that are considered to be risk free and recognized by rating agencies as default secured. Thus, it would be logical

to take Lithuanian government bonds as a proxy for risk free return, however, in recent decades Lithuanian credit rating did not satisfy the requirements for risk free return (Aleknevičienė, Basevičiūtė, 2017). Therefore, 10 years of German government bonds return will be taken as a standard for the risk free rate. For the expected market return, OMX Baltic Benchmark will be taken as it is a comparative index suitable for general market returns calculations and well represents the Baltic market within which this paper focuses.

For weighted average cost of capital (WACC) which is instrumental to receiving the ultimate result of EVA, the following formula is used:

$$\text{WACC} = (E/V \times R_e) + ((D/V \times R_d) \times (1 - T)) \quad (4)$$

Where,

$E$  = market value of the company's equity (market cap)

$D$  = market value of the company's debt

$V$  = total value of capital (equity plus debt)

$E/V$  = percentage of capital that is equity

$D/V$  = percentage of capital that is debt

$R_e$  = cost of equity (required rate of return)

$R_d$  = cost of debt (yield to maturity on existing debt)

$T$  = tax rate

Calculations of Economic Value Added requires weighted average cost of capital (WACC) calculations, which in return requires the cost of equity calculations as explained. These calculations are of utmost importance as they can significantly affect the results. Therefore, they will be

Table 3. Betas ( $\beta$ ) of the companies over the period of 2004-2018

Company	<i>Žemaitijos pienas</i>	<i>Vilkyskių pieninė</i>	<i>Rokiškio sūris</i>	<i>Pieno žvaigždės</i>
Beta ( $\beta$ )	0,72	0,6	0,5	0,48

presented in more detail. The risk-free rate is calculated based on returns of 10 years Germany government bonds which is an accepted standard, specifically, the daily average return is calculated over the period from 2004 January 1 to 2018 December 31 as pertaining to the period investigated. This yields the average risk free return and also smooth out volatility which could distort overall results if a shorter period would be taken for the analysis. The result yields 2,22% risk free rate over the analysed period. In the same way, the market return is calculated taking OMX Baltic Benchmark returns over the same period, the result yields the market return of 3,55%. Also, as required by the cost of equity calculations, betas ( $\beta$ ) are calculated of all four companies analysed. For calculations companies' returns over the period analysed are regressed against market return which in this paper is assumed to be reflected by OMX Baltic Benchmark. The results are presented in Table 3. These calculations together with the cost of debt calculations help to find Economic Value Added (EVA) of the companies analysed. All of these calculations have to be made taking the same time periods and it also has to be assumed that they hold for the period analysed for the results to be consistent and valid (Aleknevičienė, Basevičiūtė, 2017).

The data employed in the paper is panel data as the target of the research is to analyse different companies over a period of time, thus involving both cross-sectional and time series attributes. The

research employs the first-difference (FD) estimator which is obtained by running a pooled ordinary least squares (OLS) regression. Therefore, after first differencing, the general equation is presented:

$$\Delta y_{it} = \alpha_0 + \alpha_3 d3_t + \alpha_4 d4_t + \dots + \alpha_T dt_t + \beta_1 \Delta x_{it1} + \dots + \beta_k \Delta x_{itk} + \Delta u_{it}, t = 2, 3, \dots, T \quad (5)$$

If the data employed in the research has the same  $T$  time periods for each of  $N$  cross-sectional units, it is said that the data set is a balanced panel: there are the same time periods for all companies. The equation integrates the chosen factors and year dummy variables for the selected research period. If this equation satisfies the classical linear model assumptions, then pooled OLS gives unbiased estimators, and the usual  $t$  and  $F$  statistics are valid for hypothesis. The important requirement for OLS to be consistent is that  $u_{it}$  is uncorrelated with  $x_{it}$ . When using more than two time periods, we must also assume that  $\Delta u_{it}$  is uncorrelated over time for the usual standard errors and test statistics to be valid.

## Data and sample

To conduct the research data of four publicly traded Lithuanian dairy producing companies, namely *Žemaitijos pienas*, *Vilkyskių pieninė*, *Rokiškio sūris* and *Pieno žvaigždės* is employed. These companies are the largest and the only publicly traded companies in Lithuania, together

combined they take a major share of the total Lithuanian dairy market. The time period analysed in this paper spans 15 years from 2004 to 2018, all data is taken from publicly available financial statements.

## Descriptive statistics

With calculations of net operating profit after tax (NOPAT) as given by financial statements of the companies as well as capital employed calculated as long term debt plus equity and the weighted average cost of capital (WACC) given by the cost of debt (total debt divided by interest expenses) and cost of equity as explained above and based on capital asset pricing model (CAMP), below the following chart of Economic Value Added figures are shown by each company.

As presented in Figure 1, all of the companies analysed had negative Economic Value Added figures during the height of the global financial crises in 2008. However, the next year they all recovered and already had positive Economic Value Added

(EVA) figures. Nevertheless, in 2009 the recovery did not match the levels of EVA reached in 2007 during the pre-crisis period which was characterized by a booming economy and inflated company earnings. From 2009 to 2013 it seems that *Rokiškio sūris* and *Pieno žvaigždės* had a steady growth in EVA until dropping sharply in 2014 and 2013 respectively. In 2014, *Rokiškio sūris* even reaches negative EVA for the first time after the financial crises of 2008. During the same period of 2009 to 2013 *Žemaitijos pienas* and *Vilkyskių pieninė* did not show as high growth and their performance was rather subdued. In 2014 forward all companies EVA started growing with *Vilkyskių pieninė* kicking off in 2015. However, *Pieno žvaigždės* starts the downward course which is only rectified in the year of 2018. Moreover, as *Pieno žvaigždės* growths in 2018 for the first time since 2014 *Vilkyskių pieninė* drops in EVA values, *Rokiškio sūris* continues the drop from 2016 and *Žemaitijos pienas* sustains the same EVA values in 2018 as in 2017 after suffering a large drop in the period of 2016-2017.

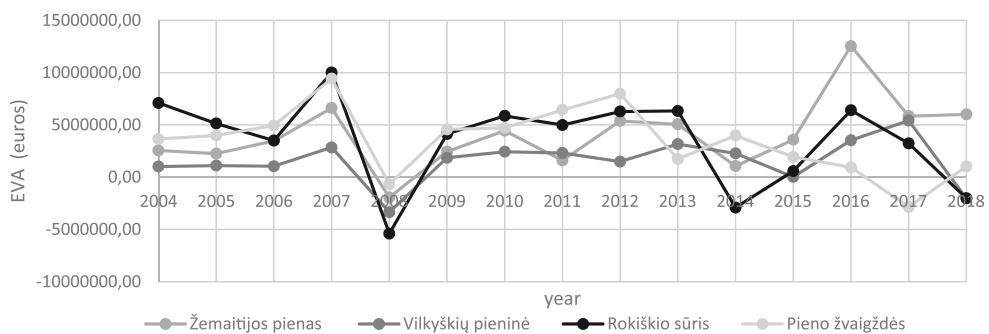


Fig. 1. The chart of Economic Value Added (EVA) of the companies analysed over the period of 2004-2018

Note: compiled by the authors.

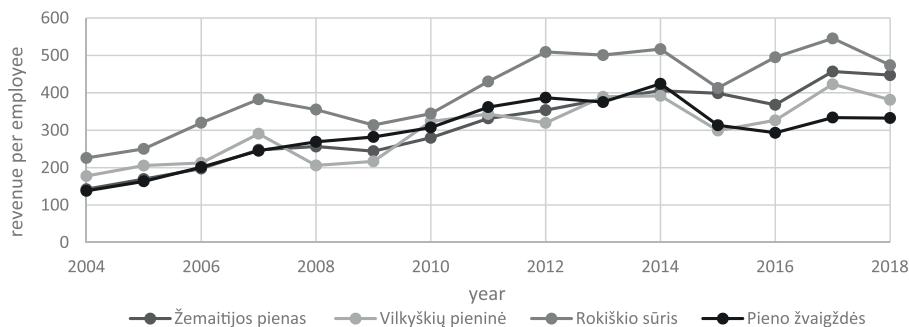


Fig. 2. Labour productivity of analysed companies over the period of 2004-2018

Note: compiled by the authors.

In conclusion, the analysis of financial performance measured by EVA for some companies such as *Rokiškio sūris* in some periods goes in the opposite direction as compared with other companies. There are periods when, for some companies, EVA becomes negative, while for other companies during the same period there is a growing trend. The results show that during 2004-2018 the EVA differs among analysed companies, thus implying that greater awareness is needed to explain financial performance influencing factors.

Figure 2 shows labour productivity as revenue divided by the average number of employees during the year in the respected companies. It shows how much revenue is generated by a single employee.

It is clear from the chart that over the whole period analysed from 2004 to 2018 *Rokiškio sūris* had the highest labour productivity of all the companies, meaning that one employee contributed the most to the company's revenue as compared with other companies. The other three companies do not seem to vary much between each other, it looks like they have productivity growth similar to each other getting

intertwined at some points in time and having a small distance between at other points in time. Overall, the trend seems to be going upward, meaning that the tendency over the period of 2004 - 2018 for the labour productivity is to grow which could be explained by technological advances, innovations and robotization that are applied and utilized in dairy producing industry companies.

Figure 3 demonstrates the gross profit margin variation throughout 2004-2018 of the companies analysed. Gross profit margin shows how much is left after subtracting the cost of goods sold from revenue expressed in percentages.

It is especially noticeable that during the height of the global financial crises in 2008 *Vilkyškių pieninė* experienced the highest drop in gross profit margin reaching negative values. Also, the graph above reveals that *Vilkyškių pieninė*, as well as *Rokiškio sūris*, move almost in tandem intertwining throughout the period except for the crisis of 2008. The same could be said about *Žemaitijos pienas* and *Pieno žvaigždės* as their gross profit margin also seem to vary in similar

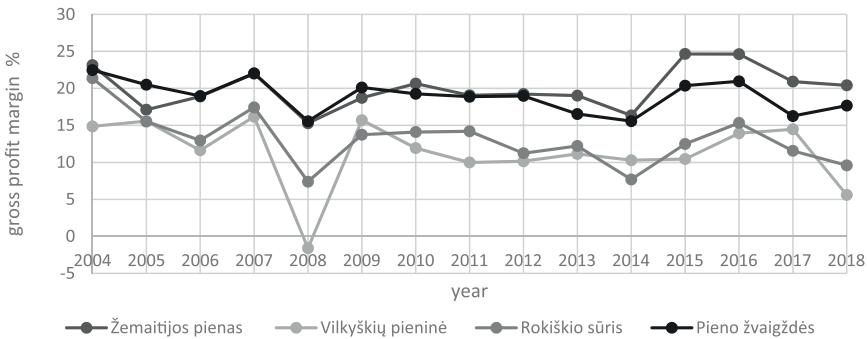


Fig. 3. The gross profit margin of analysed companies over the period of 2004-2018

Note: compiled by the authors.

patterns. This propagates the idea that these two blocks of companies manage the cost of goods sold differently as *Vilkyškių pieninė* and *Rokiškio sūris* have lower gross profit margin during the whole period than *Žemaitijos pienas* and *Pieno žvaigždės* which arguably indicates better efficiency and resources application for the latter companies. For the last 3-4 years, *Žemaitijos pienas* seems to be particularly distancing itself from all of

its main three competitors retaining the highest gross profit margin with unyielding continuation.

The following figure shows how much of the total production produced by the company is exported abroad. This is calculated in terms of total revenue in relation to revenue earned in foreign countries where production is exported as compared with the Lithuanian market; it is expressed in percentages.

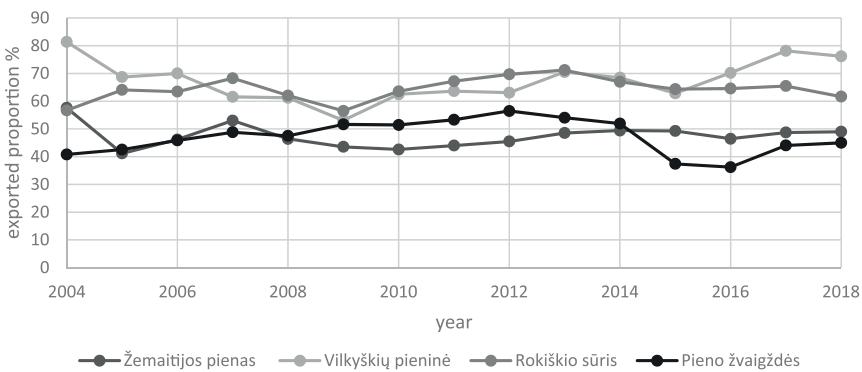


Fig. 4. The proportion of exported production over the period of 2004-2018

Note: compiled by the authors.

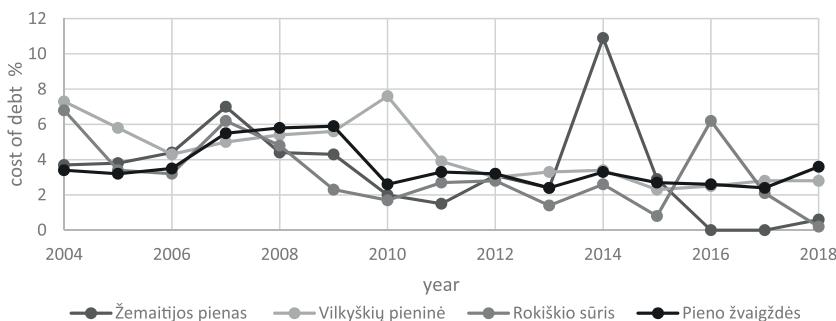


Fig. 5. Cost of debt over the period of 2004-2018

Note: compiled by the authors.

It is clearly indicated in the export data that *Pieno žvaigždės* and *Žemaitijos pienas* throughout the period analyzed balances between half of its production being exported and another half sold at home market. With *Vilkyškių pieninė* and *Rokiškio sūris*, the companies persistently have more than half of its production exported abroad during the 15-year period analyzed, from 2004 to 2018. This indicates that these two companies are much more concerned with the foreign market and thus are more influenced and affected by demand abroad than in the Lithuanian market. Yet again two blocks of companies can be distinguished as having similar characteristics. Moreover, in recent years these characteristics as pertaining to exports seem to be reinforced as the gap between *Pieno žvaigždės*, *Žemaitijos pienas* and *Vilkyškių pieninė*, *Rokiškio sūris* seems to grow as of 2014 forward as compared with previous periods.

The following figure indicates the cost of debt of each company analysed during the span of 15 years. It shows how much the borrowings of the company cost in

percentage terms. More precisely, these are the interests paid for interest bearing debt.

The cost of debt does not seem to vary much among the companies analysed during the period. It could be because all these companies are operating in the same market as well as industry thus, they share similar risk factors which partly influence the price of debt. Also, they have similar borrowing conditions and opportunities which both explain the similar cost of debt rate patterns. However, there is one outlier, namely *Žemaitijos pienas*, which in 2014 had a particularly high cost of debt. Nevertheless, the overall trend over the 15 years analyzed seems to be of lowering the cost of debt as comparing the first half of the 15 years period with the second half of the period.

This section presented and discussed the variables of the research, that is Economic Value Added (EVA), labour productivity, gross profit margin, the proportion of exported production and cost of debt that are used for the econometric model estimations that follow in the next chapter.

## Results

According to the econometric model introduced and specified, estimations were made with data used for this research and are presented in Table 4. As discussed, the first difference (FD) estimator is used and the pooled OLS approach is employed through Statistical software. T denoting time is equal to 15 (time series dimension) and N denoting units is equal to 4 (cross section dimension), in other words, 4 companies are analysed over the period of 15 years. Because T and N are not the same in this research, the panel data is the unbalanced one. For estimates to be efficient, it has to satisfy assumptions that  $\Delta u_i$  is uncorrelated with  $\Delta x_j$ , that  $\Delta x_i$  must have some variation across i and also the homoskedasticity assumption has to be satisfied. In general, if the equation satisfies the classical linear model assumptions, then pooled OLS gives unbiased estimators, and the usual t and F statistics are valid for hypothesis testing. In order to check the assumption that  $\Delta u_{it}$  is uncorrelated over time for the usual standard errors and test statistics to be valid, serial correlation or autocorrelation as it is also known is tested. Firstly, the first differenced equation with pooled OLS is estimated and residuals are obtained, these residuals are then included in the original model as an explanatory variable, however, the residual variable has to be lagged before including it into the model. Afterward, the regression is rerun with this lagged residual variable which indicates whether the serial correlation is present or not. In this case, the variable coefficient (first-order autocorrelation coefficient) received is -0, 3961 with significance at

the 5 percent level. As the coefficient is considered of fairly small negative value, it is concluded that there is no serial correlation in the model. Then, the model is checked for heteroscedasticity with the White's test. The null hypothesis that heteroscedasticity is not present is rejected, meaning that the assumption of error term having constant variance is violated. To account for this problem the model is estimated with robust standard errors, these heteroscedasticity-consistent standard errors are used to allow the fitting of a model that does contain heteroscedastic residuals. Thus, unbiased standard errors of OLS coefficients under heteroscedasticity are obtained. Following these procedures, the model is determined to render OLS the best linear unbiased estimator (BLUE). The estimations of the model provide the information needed to evaluate the validity of the problem and aim raised for this research. The estimation results are presented in Table 4.

The model estimation with robust standard errors clearly indicates that only two independent variables out of total four are found to be statistically significant, namely the gross profit margin and exported proportion (revenue from exporting). It is evident that the exported proportion of products has a positive significant effect on Economic Value Added (EVA) with significance at the 5% level. Also, as seen gross profit margin has a positive significant effect on Economic Value Added (EVA) with significance at the 10% level. The other two independent variables, namely, change in labor productivity and cost of debt are found to be statistically insignificant. R-squared ( $R^2$ ) represents the proportion of the variance for a dependent variable that is

Table 4. Pooled OLS estimates, Dependent variable: d\_EVA

	(1)
Const	2,981e+04 (2,308e+04)
d_change in Labor productivity	976,9 (1845)
d_Gross profit margin	7,159e+05* (2,457e+05)
d_exported proportion	2,746e+05** (6,875e+04)
d_cost of debt	2,454e+04 (7,521e+04)
N	55
R <sup>2</sup>	0,6034
LnL	-897,5

Note: standard errors in parentheses

\* indicates significance at the 10 percent level

\*\* indicates significance at the 5 percent level

explained by an independent variable in a regression model and in this case, it is over 60%. Gross profit margin is found to have the strongest effect on EVA as it not only statistically significant but also has the highest positive value, meaning that an increase in gross profit margin will increase Economic Value Added (EVA) the most as compared with other independent variables. This gives a clear indication of what a company has to be concerned with in order to increase EVA most effectively and by the largest amount. Furthermore, the econometric model estimations do not confirm that the change in labour productivity is statistically significant. Thus, it is concluded that labour productivity has no statistically significant effect on Economic Value Added (EVA).

## Discussion

In conclusion, comparing the results with previous research (Saboniene, Markauskas, 2015) – the gross profit margin is found to be statistically significant and positive (in line with previous research). Revenue from exporting is revealed to be statistically significant and positive (opposite to the previous research). The longer data spam includes periods of Russian embargo and the export growth from 2014 for some companies which could have influenced the results. Labour productivity is found to be statistically insignificant, however, the validity of such outcome remains an open question as different outcomes could be expected in different sectors. Cost of debt is found to

be insignificant while in previous research the effect was found statically significant and negative. This could be explained that in this research the longer data span was investigated, which covers the periods with zero EURIBOR floor.

This research took the largest time span possible that is 15 years from 2004 to 2018 as the majority of companies have publicly available financial statements only from 2004. Thus, the time period limitation cannot be avoided. A major limitation of this research is the selection of independent variables in the econometric model. Many other variables might be included in the model that could affect the overall results. Thus, for further research, it would be highly recommended to include different variables and to evaluate the variation in estimated results. Another limitation regards the calculations of variables included in the research. The assumptions made for EVA calculations might significantly distort results that might not adequately hold in reality and severely deviate from true values of economic value-added. Mostly it could occur because the information that is provided in the financial statements is lacking necessary items that would help to make precise calculations making appropriate adjustments. Unfortunately, these limitations are unlikely to be overcome in the future research of the same interest. Moreover, beyond the technical limitations of the research, the fundamental one is also very important. This research concentrated on the dairy-producing companies and as such, it is a huge limitation, because there are only four publicly traded companies that could have been included in the research. Therefore, future research could easily look into different

industries with more publicly traded companies. For the empirical part of the research, the inclusion of more companies could substantially increase the data sets which in turn would make results more reliable. In addition to that, the inclusion of more companies of the same industry or even several interrelated industries could provide new insights and perspectives which otherwise would not be possible. Another fundamental research limitation is that in analysing and researching the financial performance of the company, it only analysed performance with one method, Economic Value Added (EVA). Even though it is a popular method for investigating financial performance, it is not by no means the only one of the best ones as every method has its advantages and flaws. Also, EVA is not the only one of the value-based financial performance evaluation methods. Therefore, future researches should not limit the scope or range of methods in researching the company's financial performance. It is best when researchers are able to minimize all potential limitations as only then the conclusion of outcomes of that research could be considered as most appropriate. Nevertheless, this research made every effort to make the limitations of the research as insignificant as possible.

## Conclusions

1. Financial performance is defined as a phenomenon that is seen as revealing the company's operations, efficiency and profitability. The definition of financial performance stresses the state of companies' financial position and the outcomes of companies' actions. Different

approaches how to define and measure financial performance – ROE, ROA, Tobin's q, EVA, etc., can be employed, the choice of which can depend on many factors including industry or company's specific goals. In this research paper, value-based financial performance measure, the Economic Value Added was chosen, which contrasts with traditional methods as it takes into account how companies create value and sustain competitive edge that allows them to retain the financial health of these companies ensuring business continuity.

2. The previous research identifies financial performance determinants, which could be classified into several groups: determinants regarding the characteristics of companies (size, market share, productivity, ownership structure, human resources), financial determinants (leverage, size, risk, non-debt tax shield, capital intensity), external determinants (credit to the sector, foreign direct investment, money supply, exchange rate, foreign exchange reserves, and interest rates). In previous research, the significance of determinants differs among the industries and sectors. Thus, for selecting determinants of financial performance it is essential to select determinants that could be justified, however, data limitations can hinder the selection process. In this research paper following the previous studies, 4 determinants are selected to investigate the impact on financial performance measured by EVA (labour productivity, revenue from exporting, gross profit margin, cost of debt).

3. The analyses of financial performance measured by EVA of the Lithuanian dairy sector for some companies

such as *Rokiškio sūris* in some periods goes in the opposite direction as compared with other companies. There are periods when, for some companies, EVA becomes negative, while for other companies during the same period there is a growing trend. The results show that during 2004-2018 the EVA differs among analysed companies, thus implying that greater awareness is needed to explain financial performance influencing factors.

4. To investigate the impact of determinants on financial performance multiple regression model was constructed and applied for Lithuanian dairy sector companies extending the time frame (2004-2018). The data employed in the paper is panel data as the target of the research is to analyse different companies over a period of time, thus involving both cross-sectional and time series attributes. The research employed the first-difference (FD) estimator which is obtained by running a pooled ordinary least squares (OLS) regression, indicating the relationship between Economic Value Added (EVA) and its determinants.

5. Regression analysis revealed that in the case of Lithuanian listed dairy sector companies tested only two determinants out of four: gross profit margin and revenue from exporting were identified as being statistically significant. Gross profit margin is found to be statistically significant and positive, which is in line with previous research. Revenue from exporting was revealed to be statistically significant and positive (opposite the previous research). The other two determinants – labour productivity and cost of debt were found to be statistically insignificant. As a result of this research, the drivers of Economic Value Added

(EVA) are identified for Lithuanian dairy producing companies which could be beneficial for understanding the value

creation processes and mechanisms of these companies and provide insights for future research.

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Asta KAMANDULIENĖ, Žilvinas KULBOKAS

## LIETUVOS PIENO SEKTORIAUS ĮMONIŲ FINANSINĖS VEIKLOS VERTINIMAS

### S a n t r a u k a

Finansinės veiklos (angl. *financial performance*) sampratos atitinkmuo – įmonės veiklos efektyvumas ir pelningumas. Kokie veiksniai lemia, kad vienos įmonės veikia sėkmingai, kokiai rodikliai būtų pamatuojami ne tik veiksniai bet ir pati įmonės finansinė veikla – aktualus šiuolaikinių mokslinių tyrimų klausimas. Ankstesnių tyrimų analizė atskleidė, kad finansinę veiklą galima įvertinti įvairiais rodikliais (ROE, ROA, Tobino q, EVA ir kt.), kurių pasirinkimas gali priklausyti nuo daugelio veiksniių, taip pat ir nuo pramonės šakos, įmonių charakteristikų. Išskiriama nemažai veiksniių, tokų kaip įmonės dydis, kapitalo intensyvumas žmogiškieji ištelių, kapitalo struktūra, kapitalo dydis, valiutos kurso norma ir kita. Empirinių tyrimų rezultatai išlieka kontroversiški. Šiame tyime siekiama išanalizuoti, kokie veiksniai ir kaip lemia įmonės finansinę veiklą.

*Tyrimo problema:* kaip išmatuoti įmonės finansinę veiklą ir kokie yra finansinę veiklą lemiantys veiksniai.

*Tyrimo tikslas:* įvertinti Lietuvos pieno sektoriaus įmonių, įtrauktų į „Nasdaq Baltic“ sąrašą, finansinę veiklą ir identifikuoti ją veikiančius veiksnius.

*Tyrimo metodai:* lyginamoji, kritinė literatūros analizė. Veiksnų poveikiui nustatyti panaudojama OLS regresija. Finansinei veiklai matuoti pasirinktas ekonominės pridėtinės vertės EVA rodiklis kaip priklausomas kintamasis. Tiriamu veiksniai, turintys įtakos EVA, – darbo jėgos našumas, eksporto dažnis pardavimų struktūroje, skolos kaštai, bendrasis pelningumas. Parengta metodika pritaikyta Lietuvos pieno sektoriaus įmonėse (pasirinktos keturios pagrindinės „Nasdaq Baltic“ kotiruojamos įmonės). Tyrimas apima 15 metų laikotarpį nuo 2004 iki 2018 m. Tyrimų skaičiavimams naudojami viešai prieinami metinių finansinių ataskaitų duomenys.

Nustatyta, kad EVA (kaip finansinės veiklos rodiklis) syruoja tiriamuoju laikotarpiu ir tam tikru metu tam tikrose įmonėse jai būdingas priesingas tendansas. Nustatyta, kad bendrasis pelningumas turi didžiausią poveikį EVA, o darbo našumo

reikšmingumas nebuvo nustatytas. Šios išvados atitinka ankstesnių tyrimų rezultatus. Priešingai nei ankstesnių tyrimų metu, nustatyta, kad eksportuota produkcijos dalis daro didelę įtaką finansinei veiklai matuoti pasirinkto EVA rodiklio vertėms, o skolos kaštai nereikšmingi.

Tolesnėmis šio tyrimo kryptimis galėtų būti metodikos taikymas skirtinguose sektoriuose. Itraukiant daugiau tos pačios pramonės įmonių ar net kelias tarpusavyje susijusias pramonės įmones, būtų galima aptikti naujų ižvalgų.