FINANCIAL RATIOS OF THE COUNTRY'S ENTERPRISES IN THE FACE OF ECONOMIC GROWTH AND DECLINE

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Abstract. *The author analyses financial ratios of Lithuanian enterprises by economic sectors in the period from 1998 to 2008. During the period in question, which was selected consciously and purposefully, Lithuanian economy experienced two recessions: the first one took place after the Russian crisis 1998 and the second started in 2008, together with the global financial crisis. In the period between the two crises, a rapid economic development was observed.*

In the paper, the efficiency of the sectors of Lithuanian economy is assessed using various financial ratios, reflecting various aspects of performance of an economic entity: its capability to secure income, to perform profitably, to properly manage liabilities, to make proper use of available potential, to avoid jeopardising its further performance. Since no common methodology for the assessment of economic efficiency has been developed, it is offered to form an integral aggregate ratio to make possible the intercomparison of economic sectors and to determine the level of efficiency based on a set of financial ratios but not on each of them separately. The experiments and calculations performed showed that most suitable is the weighted arithmetic mean method.

Key words*: financial ratios, efficiency, aggregate ratio, weighted mean method*

Introduction

After the period of a rapid annual growth in gross domestic product, which started in 2000, Lithuania – similarly to other European and world countries – is facing economic difficulties. Economic growth is always followed by a certain economic slowdown; the current situation, however, has been caused by something more than just economic cycles – it is contributed to by the global financial market crisis.

The present article examines the challenges met by Lithuanian economy from the aspect of the efficiency of national economic sectors, because the efficiency of performance – contributing to the increase in productivity, reduction in unnecessary costs, etc. – is one of the key factors responsible for the good condition of individual enterprises, entire sectors and the whole economy at different stages of the economic cycle and during crises. A single financial ratio does not suffice for tan accurate assessment of

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economic efficiency; a set of financial ratios has therefore to be selected in such a way that an aggregate ratio, built on those financial ratios, reflects various aspects of performance of an economic entity: its capability to secure income, to perform profitably, to properly manage liabilities, to make a proper use of the available potential, to avoid jeopardising its further performance.

The topicality of the article resides in the fact that no common methodology for the assessment of economic efficiency in Lithuania has been developed; each institution for this purpose uses different, subjective methods – expert assessment of decisive factors and their importance for overall efficiency. In Lithuania, the Department of Statistics to the Government of the Republic of Lithuania (Statistics Lithuania) is the institution producing information on the financial ratios of enterprises and their changes. In this field, efforts have been made to form an integral aggregate ratio for the assessment of the efficiency of economic sectors – to make possible an intercomparison of economic sectors and determining the level of efficiency based on a set of financial ratios but not on each of them separately.

1. Efficiency of economic sectors: financial and economic assessment

Similarly to business competitiveness, efficiency may be analysed at three – enterprise, economic activity and national – levels. Enterprise efficiency analyses are usually performed on the initiative of enterprises and are meant for internal use only, while the analysis of the efficiency of economic sectors is an intermediate option between the assessment of the national economy and of an enterprise. Enterprise condition and efficiency assessment criteria may be used for the assessment of both the whole economy and certain economic activities.

The performance of each economic entity may be measured using ratios based on the financial data on the entity. Such financial ratios are divided into the following groups:

1) income security ratios (gross profit margin, profitability, return on assets, etc.);
2) financial leverage ratios (debt, current, leverage, receivables turnover, etc.);
3) cash flow to financial leverage ratios (debt coverage, fixed assets coverage).

Based on enterprise financial and economic performance analysis data, the condition of an enterprise may be assessed as very good, good, satisfactory, unsatisfactory or bad. Inasmuch as the same ratios are used for the assessment of economic sectors, it may be stated that their condition may also by assessed by such criteria.

Given a wide variety of financial ratios, it is difficult to assess them all at the same time and draw conclusions about performance efficiency. Therefore, a set of key ratios should be selected, which would reflect the capability of economic entities / sectors to secure income, make a proper use of borrowed funds, discharge liabilities, etc. After the

ratios selected have been aggregated using a certain method, the integral aggregate efficiency ratios would be calculated for economic sectors, based on which the efficiency of Lithuanian economy and its sectors would be assessed.

In compiling a ratio to be used for assessing the efficiency of economic sectors, the availability of objective and sufficiently accurate data, as well as the established practice of assessing the efficiency of performance of economic entities, based on financial indicators, should be taken into account (Mackevičius and Poškaitė, 1998).

The article focuses on the efficiency of using financial and material resources in economic sectors; therefore, the aggregate efficiency ratio will be formed from financial ratios. In selecting financial ratios, it is purposeful to define certain selection criteria to avoid problems about aggregating the efficiency ratio: the financial ratio should preferably be measured per cent; a higher value of the ratio should be assessed as a better one; the ratio should not acquire a negative value.

According to respective criteria, the following nine financial ratios have been selected for primary analysis:

1) gross profit margin (gross profit / sales);
2) profitability ratio (pre-tax profit / total costs);
3) return on assets ratio (pre-tax profit / assets);
4) debt ratio (liabilities / assets);
5) leverage (gearing) ratio (equity/liabilities);
6) current ratio (current assets / current liabilities);
7) receivables turnover ratio (sales / amounts receivable within one year);
8) fixed assets turnover (return on fixed assets) ratio (sales / fixed assets);
9) equity turnover (return on equity) ratio (sales / owner's equity).

The first three ratios fall within the group of income security ratios. A gross profit margin is an important ratio showing the capability of the sector to undertake its prin-

TABLE 1. **Characteristics of the financial ratios selected**

Ratio	Measure	Limits	Higher value	Negative value
Gross profit margin	Per cent	Yes	Better	Possible
Profitability ratio	Per cent	No	Better	Possible
Return on assets ratio	Per cent	No	Better	Possible
Debt ratio	Per cent	Yes	Worse	Impossible
Leverage ratio	Per cent	Yes	Worse	Impossible
Current ratio	Times	Yes	Better	Impossible
Receivables turnover ratio	Times	No	Better	Impossible
Fixed assets turnover ratio	Times	Yes	Better	Impossible
Equity turnover ratio	Times	No	Better	Impossible

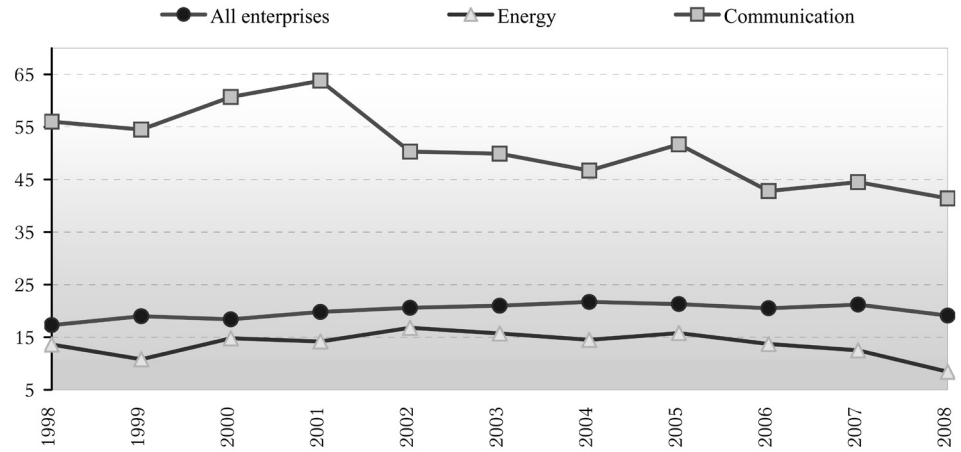

FIG. 1. **Gross profit margin in the whole economy and extremes**

TABLE 2. **Gross profit margin in economic sectors, %**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All enterprises	17.3	19.0	18.4	19.8	20.6	21.0	21.7	21.3	20.5	21.2	19.1
Mining and quarrying	25.2	38.5	60.7	56.9	51.1	48.1	48.8	46.4	45.3	43.3	44.2
Manufacturing	16.2	17.7	16.1	17.8	18.8	20.4	22.0	20.4	17.6	18.5	13.8
Energy	13.6	10.8	14.8	14.2	16.8	15.7	14.5	15.8	13.7	12.6	8.4
Construction	16.2	16.9	16.9	18.2	18.5	19.8	19.7	19.9	21.3	21.4	19. 0
Trade	15.2	16.8	15.1	16.0	16.6	17.1	17.2	17.1	17.5	17.9	17.9
Hotels and restaurants	30.1	43,2	38.4	38.3	42.7	42.6	44.6	46.4	47.7	49.2.	47.4
Transport	19.5	20.8	19,;7	23.6	23.8	21.6	23.9	22.1	22.1	21.5	17.4
Communication	56.0	54.5	60.7	63.8	50.3	49.9	46.7	51.7	42.8	44.5	41.4
Real estate	26.5	35.8	30.1	37.4	39.1	39.4	40.2	44.7	42.7	44.5	43.8

Calculated according to data of Statistics Lithuania, http://www.stat.gov.lt

In the recent nine years, the gross profit margin of Lithuanian enterprises has been slightly growing; in 2008, however, it was decreasing in almost all sectors, with a modest growth recorded in just two – extractive (mining and quarrying) and trade – sectors. The mining and quarrying sector is quite a unique one, because the product that is later provided for sale is not purchased but extracted, which makes its cost price fairly indeterminable. Presumably, with the growth in sales prices, the cost price in this sector did not change considerably, which conditioned the growth in the gross profit margin. Easier interpretable is the trade sector where the growth in the gross profit margin means that, with the decrease in the cost price, sales prices remained unchanged, or the decrease in sales prices was less sharp than that in the cost price.

The gross profit margin in Lithuanian economy amounts to approximately 20 per cent, with the highest values recorded in the hotels and restaurants, mining and quarry-

also be expressed in days; in this case, the ratio shows the number of days during which, on average, payments for goods or services are received. For the ratio in question to be expressed in days, the number of days in the year (365) is to be divided by the receivables turnover ratio. As the aim is that the amounts receivable within one year are as low as possible, the higher the receivables turnover and the lower the receivables turnover in days, the better. Changes in the receivables turnover ratio in Lithuanian economic sectors are presented in Fig. 5.

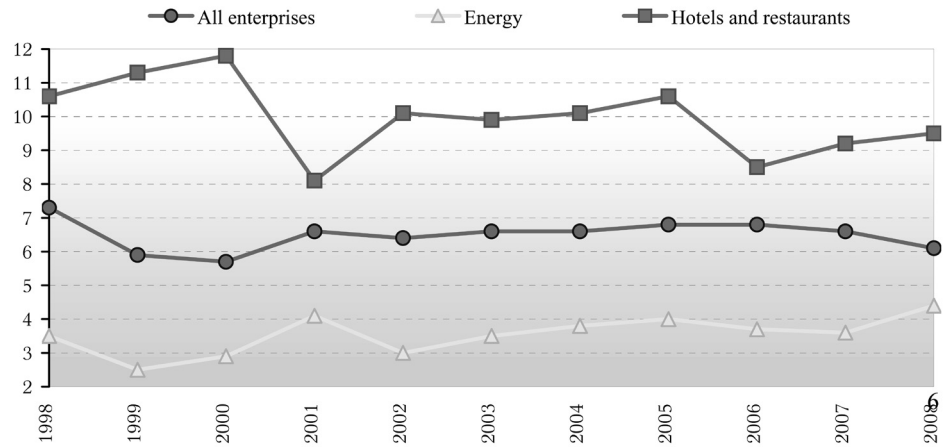

FIG. 5. **Receivables turnover ratio in the whole economy and extremes**

Calculated according to data of Statistics Lithuania, http://www.stat.gov.lt

In the recent decade, the receivables turnover ratio in Lithuanian economy decreased from 7.3 to 6.1, which means that enterprises have been progressively delaying payments for goods and services provided to them. In 2008, the receivables turnover ratio in the whole economy dropped by 7.5 per cent. Although in five out of the nine sectors discussed in the article the value of the ratio was increasing, in the rest of the sectors – the most influential and largest ones (real estate, construction, trade, and transport) – it was decreasing. It is not uncommon that delays in payment to the real estate and construction sectors, caused by the grave situation of debtors, bring to bankruptcy not only the debtors but also the creditors who in turn are debtors of other enterprises. This entire situation impacts on the trade sector because, for example, the construction sector purchasing building materials becomes indebted to it. Given the further deterioration in the situation and more or less strong links among the sectors, receivables turnover may be decreasing in other sectors as well.

The receivables turnover ratio varies widely from sector to sector. In 2008, the highest ratio in question was recorded in the hotels and restaurants (9.5) and manufacturing (7.7) sectors and the lowest in the real estate (2.7).

Presumably, the impact of the six component ratios on the aggregate efficiency ratio is dissimilar; it is therefore appropriate that the component ratios are attached certain weights. Weights should best be attached taking into consideration the degree of independence of the ratios fon economic sectors; the greatest weights should be attached to those ratios which are similar for all economic sectors, regardless of their specific features, and the lightest weights to the ratios that are more dependent on specific features of the sectors. It should therefore be determined which of the six ratios are more – or less – dependent on specific sectors, and attribute to them respective weights. It is assumed that the ratios the values of which in the sectors under consideration differ the least are less dependent on specific features of the sectors. For the assessment of the dependence of the ratios on economic sectors, a mathematical analysis of the values of these ratios has been performed. First, simple arithmetic means of all ratios in all sectors over the eleven years were calculated. The results are presented in Table 4.

TABLE 4. **Values of the arithmetic mean of the financial ratios selected, 1998–2008**

	Gross profit margin	Return on assets ratio	Leverage ratio	Current ratio	Receivables turnover ratio	Equity turnover ratio
Mining and quarrying	46.23%	21.98%	3.32	2.67	7.02	1.14
Manufacturing	18.10%	4.48%	0.99	1.42	7.06	2.64
Energy	13.71%	2.16%	3.44	2.22	3.54	0.56
Construction	18.90%	9.81%	1.03	1.43	4.74	3.01
Trade	16.78%	8.24%	0.63	1.33	8.25	6.10
Hotels and restaurants	42.78%	2.32%	1.25	1.10	9.97	1.36
Transport	21.47%	3.26%	2.00	1.46	6.35	1.03
Communication	51.11%	11.74%	2.51	1.79	5.86	1.03
Real estate	38.57%	7.44%	1.21	1.24	4.26	1.12

Source: compiled by author.

Based on the values of the arithmetic mean for each ratio in each sector, it has been determined how the values of that ratio vary from sector to sector, by calculating the mean and standard deviation of a data series using the MS Excel Descriptive Statistics tool. Descriptive statistics on each ratio are presented in Table 5.

TABLE 5. **Means and standard deviations of values of the financial ratios selected**

	Gross profit margin	Return on assets ratio	Leverage ratio	Current ratio	Receivables turnover ratio	Equity turnover ratio
Mean	29.74%	7.94%	1.82	1.63	6.34	2.00
Standard deviation	14.68%	6.27%	1.05	0.51	2.02	1.74

The value of a financial ratio is in the interval mean ± standard deviation. For the relative assessment of a standard deviation, standard deviation to mean ratios are calculated. The results (in ascending order) are presented in Table 6.

TABLE 6. **Standard deviation to mean ratio for the financial ratios selected**

Ratio	Standard deviation / mean
Current ratio	0.31
Receivables turnover ratio	0.32
Gross profit margin	0.49
Leverage ratio	0.58
Return on assets ratio	0.79
Equity turnover ratio	0.87

As one can see from the above tables, least scattered are the values of the current and receivables turnover ratios, while the most scattered are those of the return on assets and equity turnover ratios. Taking into consideration the results obtained, it is worth considering whether the scattering of the values of the ratios is economically logical.

The current ratio, measuring current assets available *to cover current liabilities*, is closely related to business risk; although it might seem that neither current assets nor current liabilities are the key enterprise performance factors, a mismatch between the two may cause serious solvency problems. The low degree of scattering may be explained by the fact that current assets are often funded by current liabilities which depend on the value of current assets; as a result, the ratios of current to total assets may vary markedly from sector to sector, while the ratios of current assets to current liabilities will be rather similar.

Quite often the receivables turnover ratio is not included in the set of key financial ratios. However, large and long-term liabilities of customers may lead to enterprises running out of cash, even despite high indicators of both sales and profit, which makes this ratio rather important in assessing efficiency. The low degree of scattering by sector may be explained by the fact that amounts receivable depend on customers rather than on the sector in which the enterprise operates, i.e. on external rather than on internal factors.

The standard deviation to mean ratio for the gross profit margin is also among the lowest. Although the values of the gross profit margin vary from sector to sector, this ratio is nevertheless one of the key financial ratios used in assessing enterprise performance, and its contribution to the assessment of efficiency is substantial.

The three remaining ratios are characterised by a higher degree of scattering, which is quite natural: not all economic sectors need the same amount of liabilities to operate successfully; not all economic sectors need the same amount of assets to earn profit; not in all economic sectors sales are in direct proportion to the owner's equity.

A lower value of the standard deviation to mean ratio is an indicator of a lower degree of scattering, which means that the variation of the values of a respective financial ratio from sector to sector is smaller. Based on the previously made assumption, such ratios should have higher weights in the aggregate efficiency ratio. For a smaller value of a ratio to represent a higher weight, the ratios should be recalculated to derivative ratios which are obtained by subtracting the ratios from 1. For the derivative ratios to be used as weights, their sum should equal 1, and the results obtained are converted into coefficients the sum of which equals 1.

Using the obtained weights, the formula for assessing the efficiency of Lithuanian economy and separate economic sectors is arranged as follows:

$$E = 0.19 \times X_1 + 0.19 \times X_2 + 0.17 \times X_3 + 0.16 \times X_4 + 0.15 \times X_5 + 0.14 \times X_6,$$

where $X_1 ... X_6$ are the financial ratios selected in the order of descending weight.

The attachment of weights is an important factor influencing the values of the aggregate efficiency ratio; however, it does not eliminate the uneven impact of ratios resulting from their absolute values. The maximum absolute values of some ratios are as low as up to 0.7, while those of other ratios as high as 12; consequently, in calculating – even a weighted – arithmetic mean, the impact of ratios with higher absolute values on the aggregate efficiency ratio would be unjustifiably high. To eliminate such a high impact, the values of all ratios should be equalised as much as possible. i.e. kept under 1. The easiest way to do this – and, by doing so, not to distort the proportions – is to divide the values of a certain ratio by the maximum value of that ratio in all sectors throughout the entire survey period. The values of the ratios expressed per cent are included in the calculation of the efficiency ratio in non-percentage form.

4. Approximate assessment of the efficiency of economic sectors

As mentioned above, the absolute value of the efficiency ratio *per se* is not interpretable; the ratio in question has only reference values set, while the most beneficial method is the intercomparison of economic sectors. Aggregate efficiency ratios for Lithuanian economic sectors, calculated according to the formula provided above, for the period 1998–2008 are presented in Table 7.

As one can see from Table 7, the value of the aggregate efficiency ratio in Lithuanian economy in the last surveyed year stood at 0.32, i.e. was by 16 per cent lower than in 2007. The lowest value of the ratio (0.23) was recorded in the construction sector in 2000 and the highest (0.72) in the mining and quarrying sector in the same year.

The efficiency of economic sectors is in a state of constant change. However, it can be seen from the aggregate efficiency ratio that the real estate sector was among the least

TABLE 7. **Values of aggregate efficiency ratios for Lithuanian economic sectors**

	1998	2000	2002	2004	2006	2007	2008	1998–2008 average	
All enterprises	0.34	0 30	0.33	0.36	0.37	0.38	0.32	0.34	**Satis-factory**
Mining and quarrying	0.39	0.72	0.62	0.63	0.64	0.57	0.56	0.61	**Very good**
Manufacturing	0.31	0.29	0.32	0.39	0.38	0.39	0.35	0.34	**Satis-factory**
Energy	0.33	0.28	0.37	0.40	0.38	0.36	0.32	0.35	**Satis-factory**
Construction	0.35	0.23	0.32	0.37	0.39	0.42	0.33	0.34	**Satis-factory**
Trade	0.47	0.38	0.40	0.42	0.44	0.48	0.42	0.43	**Good**
Hotels and restaurants	0.42	0.44	0.40	0.41	0.42	0.43	0.40	0.41	**Satis-factory**
Transport	0.33	0.32	0.35	0.35	0.36	0.36	0.30	0.34	**Satis-factory**
Communication	0.47	0.44	0.41	0.48	0.59	0.54	0.44	0.48	**Good**
Real estate	0.40	0.31	0.33	0.31	0.33	0.38	0.31	0.33	**Satis-factory**

Source: compiled by author.

efficient ones from the very year 2002, while most stable with the highest efficiency was the mining and quarrying sector which was markedly outpacing the rest of the sectors throughout almost the entire period in question.

Although the absolute value of the aggregate efficiency ratio is not interpretable, the absolute values of the aggregate efficiency ratio may be assessed by means of compiling reference aggregate efficiency ratios based on the reference values of component ratios presented above. For the values that have no numerical limits, a very good value was considered to be that of the sector with the highest mean value, the mean value of all enterprises being a medium value, and the value of the sector with the lowest mean value being a bad value; intermediate values have been calculated as a mean of adjacent values. Reference values for the assessment of absolute values of the aggregate efficiency ratio are presented in Table 8.

TABLE 8. **Reference values for the assessment of the aggregate efficiency ratio**

Very good	Good	Satisfactory	Unsatisfactory	Bad
$E > 0.58$	$0.58 > E > 0.41$	$0.41 > E > 0.24$	$0.24 > E > 0.16$	$E < 0.16$

Based on these reference values, economic sectors may be divided into groups. Since what matters most is the current economic situation, economic sectors should best be grouped according to the values of the aggregate efficiency ratio in 2008. The major share of economic sectors, as well as the whole economy, fall within a satisfactory category. None of the Lithuanian economic sectors falls within the "very good" category, while those falling within the "good" category are the mining and quarrying, trade, and communication sectors. Likewise, none of the Lithuanian economic sectors falls within the "bad" category; however, in 2008, one sector – transport – fell within the unsatisfactory category, the real estate sector being very close to it.

This study gives an overall and approximate assessment of the efficiency of Lithuanian economic sectors. However, a more in-depth analysis is called for – taking a closer look at each sector and researching into the decisive factors influencing the aggregate efficiency ratio, which would allow determining the impacts on the values of the ratio and what should be done to enhance the efficiency.

Conclusions

The results of the methodologically based calculation of the aggregate efficiency ratio for Lithuanian economic sectors and assessment of their efficiency reflect the current situation in Lithuanian economic sectors. It may be stated that the method used in the formation of the aggregate efficiency ratio is suitable for assessing the efficiency of economic sectors.

Based on the above research, the following conclusions have been made:

1. The assessment of economic efficiency is one of the key components in competitiveness research conducted by influential world organisations; however, no practice of an integrated assessment of the efficiency of Lithuanian economic sectors has yet been introduced.
2. The efficiency of economic sectors is reflected by financial ratios of enterprises within those sectors; therefore, they may equally serve as a basis for the analysis of the efficiency of economic sectors.
3. After an overview of the possible methods of forming the aggregate efficiency ratio and values of financial ratios being assessed, it was concluded that the weighted arithmetic mean method suited best for the calculation of the aggregate efficiency ratio based on financial ratios.
4. The aggregate efficiency ratio was compiled, which showed that the efficiency of most Lithuanian economic sectors and of the whole economy was satisfactory, while before the year 2008 it had been following an upward trend.
5. Assessment of the reasons that impact the efficiency of economic sectors showed that these reasons varied from sector to sector; some sectors were less efficient due to their specific features. However, there were certain factors that were res-

ponsible for a lower – than it could possibly be – efficiency in most of the sectors.

6. To improve the efficiency of Lithuanian economic sectors, the first thing to be done is to maximise the efficiency of the use of available assets, particularly in the sectors where state enterprises predominate.

In the period of economic growth, economic efficiency was not growing as rapidly as the economy itself. Therefore, as major difficulties were faced, efficiency started rapidly declining, which could already be seen from the results of the year 2008, despite the fact that they still only partially reflected the economic downturn. Lithuanian economy as a whole, and certain sectors in particular, underestimated the risk and the possible economic slowdown, which resulted in hard survival against the economic downturn.

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