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METHODOLOGY OF COMPLEX ANALYSIS OF COMPANIES' PROFITABILITY

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Abstract. Profitability is one of the most important companies' activity indicators. In the article, all profitability ratios are divided into three groups: sales, assets and equity. The importance of their analysis is underlined. In the financial analysis literature, the most common calculations of various financial indicators provided lack attention of their analysis. The complex analysis methodology recommended in the article comprises: 1) determination of analysis aims; 2) choice of analysis sources and technical methods; 3) calculation and evaluation profitability of sales (gross and net), profitability of assets (total assets, fixed and current assets), profitability of equity (authorized capital, shareholders' equity and capital employed); 4) determination of factors influencing profitability; 5) usage of information collected during the analysis for internal and external users purposes. The recommended complex analysis methodology can be successfully applied to companies of various size and activity. After successfully applying it, it is possible to objectively evaluate efficiency of company's activity, potential risks, competitiveness and possibilities of continuity.

Keywords: net profit, gross profit, complex analysis, profitability of sales, profitability of assets, profitability of equity, profitability ratios.

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1. Introduction

In order to objectively evaluate efficiency of company's activity, its competitiveness and possibilities of continuity, it is crucial to calculate and evaluate the profitability ratios. Especially, a lot of useful information is obtained when comparing the profitability ratios of the financial year with the profitability ratios of the previous financial years, other similar companies and average rates of industry sectors' profitability.

However, a question arises how and which profitability ratios should be calculated, named and evaluated? Various Lithuanian and foreign authors provide different names for profitability ratios and a different number of them in their scientific articles. The scientists of economic theory usually suggest to calculate two profitability ratios: gross

profit margin and net profit margin. It is appropriate to name these ratios as gross and net profitability of sales because they are calculated by respectively dividing gross and net profit from sales revenue. However, these two indicators are not enough to fully evaluate efficiency of company's activity. Since the company's profit is to a large extent dependent on efficient usage of assets and equity, it is obligatory to calculate and analyse not only profitability of sales but also profitability of assets and equity ratios. In many works of foreign authors (Gibson, 1992, 2012; Stickney, 1993; Fridson and Alvarez, 2011; Maynard, 2013; Plenborg and Petersen, 2011; Stickney, Brown and Wahlen, 2006 and others), two terms are used to describe profitability: "profitability" and "return". The term "profitability" is used when analysing sales profitability ratios, whereas "return" describes assets and equity profitability. It is necessary to agree with J. Mackevičius opinion that it is not accurate. If profit is divided from sales revenue when calculating profitability, then it is named as sales profitability. Therefore, if we divide profit from assets or equity, these ratios have to be called assets and equity profitability instead of "return" ratios. On the other hand, in the theory of companies' activity analysis, return on assets ratio is ratio that shows the value of production divided from the value of the tangible assets (Mackevičius, 2007).

In the financial analysis literature (Bagdžiūnienė, 2005; Buškevičiūtė, Kanapickienė and Patašius, 2010; Juozaitienė, 2007; Liaubienė and Martirosianienė, 2008; Labonaitė and Subačienė, 2014; Mackevičius, Molienė and Poškaitė, 2008; Gibson, 2012; Dunn, 2010; Bernstein, 1993; Савицкая, 2003; Black, 2004; Brigham and Daves, 2004; Maynard, 2013 and others), usually only the calculation formulae of some profitability ratios are presented separately without any attention to evaluation of their values. In most cases, gross and net profitability (i.e. profitability of sales) are analysed. There is a lack of systematic approach when performing complex analysis of companies' activity profitability in the aspect of assets and equity.

The object of the research is the complex analysis of companies' profitability.

The aim of the article is to prepare a methodology of complex analysis of companies' profitability, so the companies' managers could use it to determine profitability of sales, assets and equity, objectively assess their changes and the factors influencing them, and make right management decisions.

The sources of the research are scientific publications by Lithuanian and foreign authors, business accounting standards: 2nd BAS "Balance sheet", 3rd BAS "Statement of profit or loss", 10th BAS "Income", etc.

The research methods are the analyses of scientific literature, collection, comparison, classification and generalization of information.

2. The significance of profit and profitability analysis in modern competitive market conditions

Profit is the ratio that defines company's activity the best: it is related to other company's activity ratios, which are assets, equity, liabilities, revenue, expenses, etc. Profit influences these ratios and they influence profit. Profit shows how efficient a company is as well as its positive and negative work sides. International Financial Reporting Standards state that profit and profitability are often used to evaluate companies' activity as well as determine changes of economic resources (Tarptautiniai finansinės atskaitomybės standartai, 2007, p.36).

Every company's goal is to get as high profit as possible, even in 1940, one of the most famous Lithuanian financial scientist V. Jurgutis wrote that if a company does not generate profit in a few years, one has to think that the country does not need such company or it is managed poorly (Jurgutis, 1940, p. 485). Especially now – in modern competitive market conditions – companies ought to generate higher profits. If a company is profitable enough, then it can invest, expand its activities, make new production, provide services and thus hold a stable position in the market (Mackevičius, 2007, p.178). So it is crucial that every company would perform profit analysis and seek how to increase the profit. Yet, it has to be noted that absolute profit ratio does not show appropriate position of

company's activity. Suppose that if three companies of the same size and sector generated €0.3 million profit then we cannot conclude that these companies were equally profitable. Therefore, it is important to compare absolute profit ratio with other ratios of company's activity, especially with sales revenue, assets and equity, i.e. to calculate and evaluate profitability ratios. It is essential to perform profit and profitability analysis regardless of whether the company is profitable or not. It has to be noted that the percentage of profitable companies in Lithuania has grown from 51.4% to 63% in the period of 2010-2014, i.e. by 11.6% (see table 1).

Table 1. Profitable and loss-making Lithuanian companies in 2010-2014 (percent.)

Year	Profitable	Loss-making	Difference
2010	51.4	48.6	+ 2.8
2011	58.9	41.1	+17.8
2012	59.8	40.2	+19.6
2013	61.2	30.8	+30.4
2014	63.0	37.0	+26.0

Source: compiled by the author based on Verslo struktūros rodikliai, 2014 [Structural Business Statistic Indicators 2014]. Vilnius: Statistics Lithuania, 2016, p. 36.

Even though that the number of profitable companies has been rising steadily in the past five years, yet their profitability is not high. That is shown by the table 2 data.

Table 2. Profit and profitability ratios of Lithuanian companies in 2010-2014

Ratio	2010	2011	2012	2013	2014	2014 compared to 2010 (+, -)
Sales revenue (millions of EUR)	50.515	60.830	66.631	70.584	72.022	21.507
Gross profit (millions of EUR)	10.181	11.447	12.353	13.030	14.158	+3.977
Net profit (millions of EUR)	966	1.880	2.133	2.079	2.242	1.276
Gross profitability (percent.)	20.2	18.8	18.5	18.5	19.7	- 0,5
Net profitability (percent.)	1.95	3.1	3.2	2.9	3.1	+1.2

Source: compiled by the author based on Verslo struktūros rodikliai 2014 [Structural Business Statistic Indicators 2014]. Vilnius: Statistics Lithuania, 2016, p. 27.

From the table 2 it can be seen that the ratios of gross and net profitability has changed insignificantly, yet they are not high enough so the companies would be able to compete in the market efficiently. It especially concerns net profitability ratios.

Of course, profitability ratios of some economy sectors and companies are considerably better. That is shown by the table 3 data.

One can see from the table 3 that the highest gross profitability was in the sector of *education* (58.1%), while the lowest one was in *manufacturing* (14.6%). Respectively, net profitability was the highest in *information and communication* and *professional, scientific and technical activities* sectors and accounted for 33.2% whereas the lowest net profitability ratio is in the economic activity of *repair of computers and personal and household goods, other personal service activities* (0.3%). The highest difference between gross and net profitability (+50.4%) is seen in the *education* economic activity, which shows that operating expenses make up a large portion of all expenses.

Table 3. Gross and net profitability ratios in particular economic activities in 2014 (percent.)

Economic activity	Gross profitability	Net profitability	Difference (+,-)
Total	19.7	3.1	+ 16.6
Forestry and logging, fishing and aquaculture	36.5	2.5	+ 34.0
Mining and quarrying	24.8	x	x
Manufacturing	14.6	x	x
Electricity, gas, steam and air conditioning supply	29.8	x	x
Water supply; sewerage, waste management and remediation activities	22.4	5.1	+ 17.3
Construction	20.8	3.8	+ 17.0
Wholesale and retail trade; repair of motor vehicles and motorcycle	15.9	2.5	+ 13.4
Transportation and storage	19.0	3.8	+ 15.2
Accommodation and food service activities	48.1	x	x
Information and communication	42.7	33.2	+ 9.5
Real estate activities	45.9	15.0	+ 30.9
Professional, scientific and technical activities	48.0	33.2	+ 14.8
Administrative and support service activities	30.8	8.2	+ 22.6
Education	58.1	7.7	+ 50.4
Human health and social work activities	56.1	8.1	+ 48.0
Arts, entertainment and recreation	18.9	1.9	+ 17.0
Repair of computers and personal and household goods, other personal service activities	43.8	0.3	+ 43.5

Source: compiled by the author based on Verslo struktūros rodikliai 2014 [Structural Business Statistic Indicators 2014,]. Vilnius: Statistics Lithuania, 2016, p. 38.

One of the most important sources to increase profitability is constant and detailed analysis of it. It has to be noted that most of the companies do not pay proper attention to profitability ratios analysis and their evaluation. There is also a lack of specific methodologies of establishing profitability ratios in the financial analysis literature. It is especially important to perform the profitability ratios analysis of not one but few ratios, i.e. to apply methodology of complex analysis of profitability.

3. The recommended scheme of complex analysis of profitability

Various internal (companies' managers, employees) and external (investors, customers, suppliers, banks, insurance companies, society) information users are interested in profitability ratios in order to achieve certain goals or interests. Managers of companies are interested in profitability of assets ratios the most to manage assets more rationally and to evaluate company's activity more objectively, whereas investors are more interested in profitability of equity because it shows the profitability of their investments. Those taking part in marketing activity are interested in profitability of sales because it shows the profitability of sales process.

It is not enough to calculate certain profitability ratios for companies' managers to make right decisions; for instance, what business activity should they choose, how to manage the company to ensure its competitiveness and continuity of activity, how to develop the business to make a constant long-term profit, etc. That is why it is crucial to continuously and constantly analyse company's profitability ratios and have a particular methodology of profitability ratio analysis.

A methodology of complex analysis of profitability ratios is proposed which, when implemented in practice, might not only help to correctly calculate and evaluate certain profitability ratios, but also to reveal the reserves of profitability enhancement (see fig. 1).

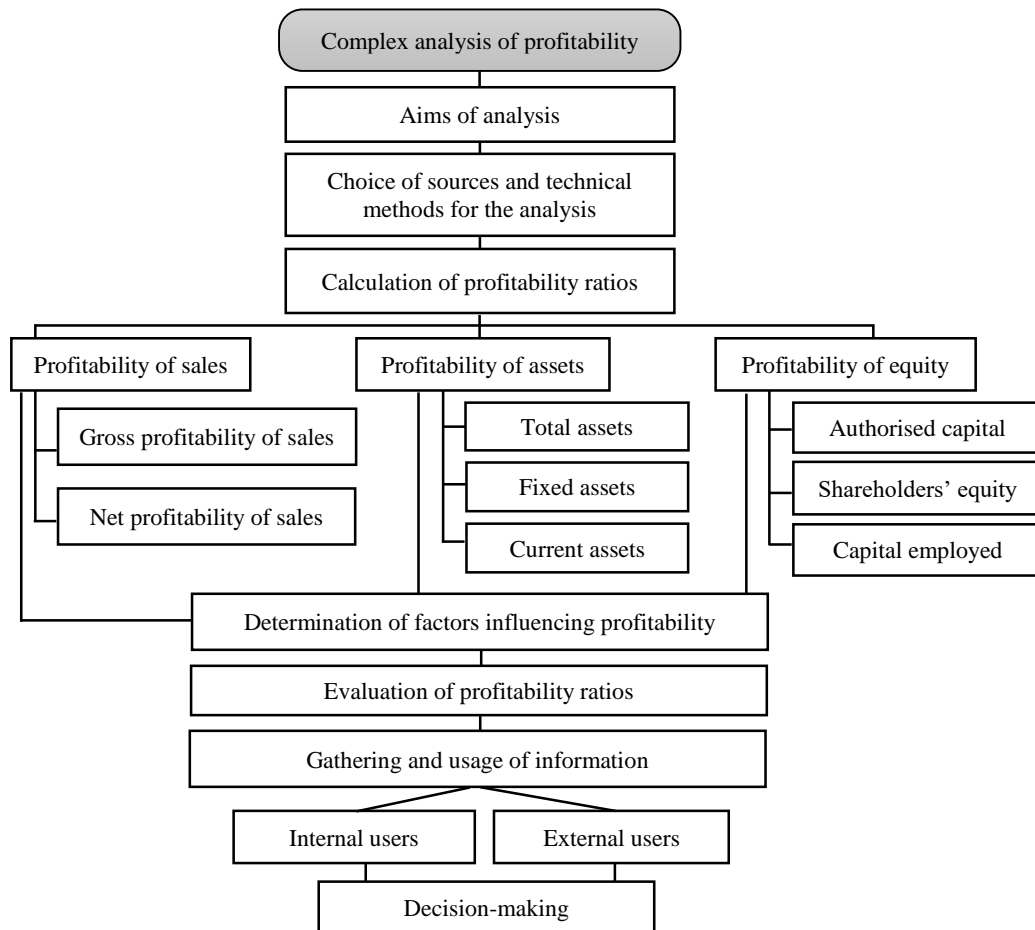


Fig. 1 Methodology of complex analysis of profitability

Source: compiled by the author based on Mackevičius, Molienė and Poškaitė (2008); Mackevičius, Giriūnas and Valkauskas (2014); Ковалев (2002); Савицкая (2005).

4. The consistency of complex analysis of profitability performance

As it can be seen from the fig. 1, it is firstly necessary to specify the aims of the profitability analysis, i. e., what one wants to achieve, for instance, to calculate current or next year profitability, determine the factors influencing it, etc. Then specific information sources are selected: budget-standard, financial accounting, financial statements and non-accounting sources. When analysing profitability, it is essential to use the data of balance sheet, profit (losses), cash-flow statements, as well as ledger accounts: 11 "Intangible assets", 12 "Tangible assets", 16 "Financial assets", 17 "Other fixed assets", 20 "Inventories", 24 "Amounts receivable within one year", 26 "Current investments", 27 "Cash and cash equivalents", 30 "Capital", 34 "Retained earnings (losses)", 50 "Sales revenue", 60 "Cost of sales", etc. When choosing methods of complex analysis of profitability, it is appropriate to use comparison, classification, elimination, specification, generalization, heuristic and others.

In the complex analysis of profitability, it is essential to decide which profitability ratios are going to be calculated and why. It is suggested to calculate these most important profitability ratios (see table 4).

Table 4. The most important profitability ratios

The titles of the ratios	Calculation of the ratios	Importance of the ratios
1. Gross profitability of sales	$\frac{\text{Gross profit}}{\text{Sales revenue}}$	This ratio shows the ability to sell the production above its cost of sales
2. Net profitability of sales	$\frac{\text{Net profit}}{\text{Sales revenue}}$	This ratio shows the sales profitability after evaluating all the income and expenses
3. Net profitability of total assets	$\frac{\text{Net profit}}{\text{Total assets}}$	This ratio shows how much euros profit goes to one assets euro.
4. Net profitability of fixed assets	$\frac{\text{Net profit}}{\text{Fixed assets}}$	This ratio shows the usage efficiency of fixed assets
5. Net profitability of current assets	$\frac{\text{Net profit}}{\text{Current assets}}$	This ratio shows the usage efficiency of current assets
6. Net profitability of authorised capital	$\frac{\text{Net profit}}{\text{Authorised capital}}$	This ratio shows how much of net profit the company received for every euro invested by the shareholders
7. Net profitability of shareholders' equity	$\frac{\text{Net profit}}{\text{Shareholders' equity}}$	This ratio shows profit created by shareholders' equity and managers' work efficiency by using invested capital
8. Net profitability of capital employed	$\frac{\text{Net profit} + \text{Interest}}{\text{Shareholders' equity} + \text{Long-term liabilities}}$	This ratio shows company's functioning possibilities and the level of development

Source: compiled by the author, based on Mackevičius, 2007.

Various internal and external users seeking certain goals might also calculate other profitability ratios. By analysing profitability of sales, it is also possible to calculate sales profitability of typical activities, sales profitability of financial and investment activities, sales profitability of ordinary activities, etc. And by analysing profitability of assets it is possible to calculate not only the profitability of total assets, fixed assets and current assets but also the profitability of the most important fixed and current assets elements, for instance, the profitability of equipment and machinery, profitability of vehicles, profitability of inventories and others.

After calculating various profitability ratios, it is crucial to properly evaluate their values. A lot of authors draw attention to this (Fridson and Alvarez, 2011; Mackevičius, Giriūnas and Valkauskas, 2014; Maynard, 2013; Plenborg, and Petersen, 2011; Juozaitienė, 2007, Sinha, 2009; Савицкая, 2003, 2005 and others). Naturally, a question arises: what should be the level of sales, assets and equity profitability for a company to be competitive and beneficial to the society. The Lithuanian Statistical Society, Department of Statistics Lithuania and SOE "Statistikos tyrimai" [Statistics studies] prepared a financial ratios evaluation methodology with profitability ratios values as intended guidelines (see table 5).

Table 5. Guidelines of evaluating a company's profitability ratios values

No.	The titles of the ratios	Values				
		Very good	Good	Satisfactory	Non-satisfactory	Bad
1.	Gross profitability of sales, percentage	>35	>15	<15	<7	Negative
2.	Net profitability of sales, percentage	>25	>10	<10	<5	Negative
3.	Net profitability of total assets, percentage	>20	>15	>8	<8	Negative
4.	Net profitability of shareholders' equity, percentage	>30	>20	>10	<10	Negative

Source: compiled by the author, based on Įmonės finansinės būklės vertinimo rodikliai 2000-2003 [Indicators measuring companies' financial standing 2000 - 2003]. Vilnius: Statistics Lithuania, 2004, p.17.

After comparing profitability values recommended in table 5 with factual profitability values in table 3, it is seen that gross profitability in some Lithuanian economic activities, such as forestry and logging, fishing and aquaculture; accommodation and food service activities; information and communication; real estate activities;

education; human health and social work activities and others is evaluated as very good. However, the net profitability ratios in the major part of economic activities (forestry and logging, fishing and aquaculture; construction; wholesale and retail trade; repair of motor vehicles and motorcycle; transportation and storage; arts, entertainment and recreation; repair of computers and personal and household goods, other personal service activities) are evaluated as non-satisfactory. It shows that companies are able to optimize the cost of sales, yet are facing problems when managing operating expenses.

Naturally, the values given in table 5 should only be treated as guidelines. Profitability ratios of companies from different economic sectors may differ considerably because of activity characteristics typical to them. Thus the most proper option would be for the companies themselves to review their profitability ratios of the previous few years, establish their own guidelines for profitability ratios and follow them.

Because of very complex, constantly changing and competitive circumstances of modern market, it is appropriate to prepare a four-level scheme to evaluate profitability ratios, which looks like this:

1. *Excellent*: it is the value that considerably (more than 100%) exceeds the medium level of the industry sectors' companies' ratio.
2. *Good*: when the company's ratio exceeds (less than 100%) the medium level of the industry sectors' companies' ratio.
3. *Satisfactory*: when the company's ratio matches the medium level of the industry sectors' companies' ratio or slightly diverges from it.
4. *Bad*: when the company's ratio is lower than the medium level of the industry sectors' companies' ratio.

The guidelines for profitability ratios values – taking into account the dynamism of modern business and constantly growing competition – might be established for a certain period, for instance 3-5 years, and changed afterwards.

When performing the complex analysis of profitability, it is important to calculate factors influencing a certain level of profitability. The factors are calculated separately for profitability of sales, assets and equity. Four main factors have an impact on gross profitability of sales: 1) the production sales volume; 2) the structure and range of production sales; 3) cost of sales; 4) price. As the products and services sales volume increases, yet the other factors stay the same, the gross profit – and meanwhile profitability – also increases. The impact of structure and range is calculated by comparing basic gross profitability of sales calculated according to the factual production volume with a base ratio. The cost of sales influence is determined by comparing the factual and basic gross profitability of sales recalculated for factual sales volume. The price factor is estimated by comparing factual gross profitability of sales – which is calculated by dividing the calculated current gross profit from factual sum of sales revenue – with factual gross profitability recalculated for base prices. It is appropriate to calculate the factors influencing profitability of assets and equity using the DuPont pyramid or its formulae:

$$1) \quad \text{Net profitability of assets} = \frac{\text{Net profit}}{\text{Total assets}} = \frac{\text{Net profit}}{\text{Sales revenue}} \times \frac{\text{Sales revenue}}{\text{Total assets}} = \text{Net profitability of sales} \times \text{Total assets turnover};$$

$$2) \quad \text{Net profitability of shareholders' equity} = \frac{\text{Net profit}}{\text{Shareholders' equity}} = \frac{\text{Net profit}}{\text{Sales revenue}} \times \frac{\text{Sales revenue}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Shareholders' equity}} = \text{Net profitability of sales} \times \text{Total assets turnover} \times \text{Equity multiplier}.$$

Therefore net profitability of sales and total assets turnover have influence on net profitability of assets, whereas apart from these factors, equity multiplier influences net profitability of shareholders' equity. This is the factors of first level. In order to determine the influence of first, second and third level factors, the DuPont pyramid analysis is performed. We provide an example of profitability of shareholders' equity pyramid analysis by using information on Lithuanian financial accounting and reporting (see fig.2).

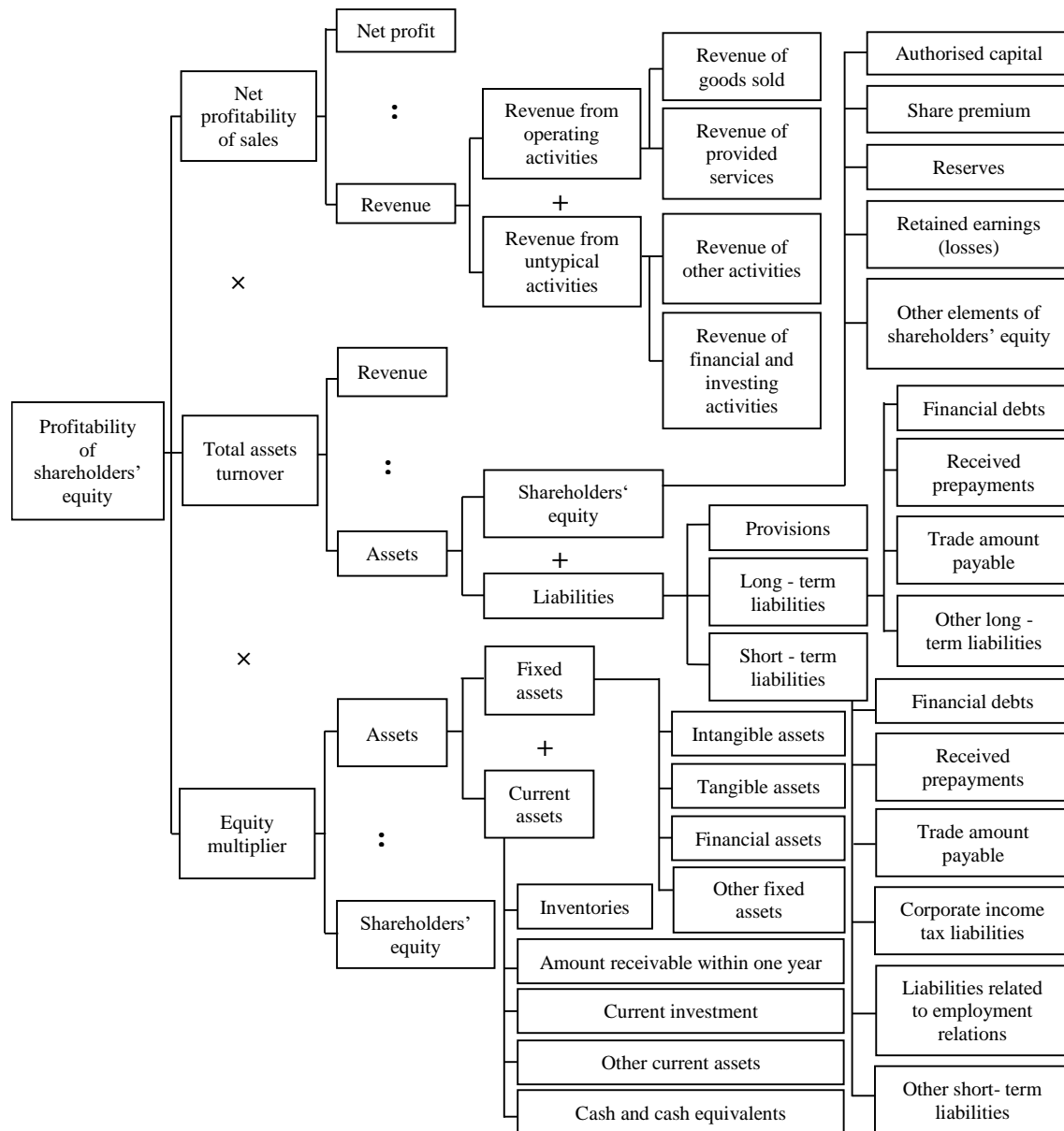


Fig. 2. Du Pont pyramid analysis of profitability of shareholders' equity

Source: compiled by the author in accordance with valid Lithuanian financial accounting and reporting information

Apart from these factors, whose influence is easily calculated, profitability of companies is also influenced by various internal and external factors, which could be calculated only approximately or could even be impossible to

calculate them, yet their influence cannot be denied (Šimberová et al. 2015). These factors are also attributed to the most important factors influencing company's profitability: 1) economic (overall level of economic development, the monetary, fiscal and tax policy of the state, inflation, etc.), 2) political and legal (legislation inciting business establishment and development, the state's foreign economic policies, aid for small businesses, and others), 3) social and cultural (the level of unemployment, population and geographical distribution, basic and economics education of the population and others), 4) technological (state-level incitement of efficient usage of technologies and innovations, state-level promotion of knowledge-based society, occupational safety, and others), 5) ecological (pollution of air, water, earth and its resources, noise, excessive heat or cold, and others).

Internal factors have even more significant influence, these are most notable: managers' activity (actions of managers are of particular importance when establishing the company's activity policies and strategy, Mentel et al. 2016), personnel management policy; i.e. anticipation of personnel strategy, selection of employees, employees training and education, employees' wages, employees relationships management (Matetskaya 2015; Prause, Hunke 2014), organisational and management structure (Fuschi, Tvaronavičienė 2016) of a company, and others.

Well-executed complex analysis of profitability gathers a lot of information about profitability of sales, assets and equity whose information is especially valuable for internal and external users of information making certain decisions. The information of analysis might help the companies' managers not only to forecast company's profitability but also to precisely evaluate possible risks and potential possibilities, establish economic, technical and other conditions of current and future business, the level and characteristics of competition, the possibilities and strategies of competitors, etc. It can even be stated that complex analysis of profitability helps to efficiently manage company's resources, make right investment and financial decisions and eventually ensure good solvency and profitable activity.

Conclusions

Various internal and external users as well as most of the authors usually calculate and analyse gross or net profitability ratios. However, these ratios ought to be named as gross and net profitability of sales because they are calculated by respectively dividing gross or net profit from sales revenue. In modern market conditions which are competitive and dynamic, it is essential to calculate and analyse not only the profitability of sales ratio but also the profitability of assets and equity ratios.

The complex sales, assets and equity profitability analysis methodology has not yet been established. The complex analysis methodology recommended in the article comprises: 1) determination of analysis aims; 2) choice of analysis sources and technical methods; 3) calculation and evaluation profitability of sales (gross and net), profitability of assets (total assets, fixed and current assets), profitability of equity (authorized capital, shareholders' equity and capital employed); 4) determination of factors influencing profitability; 5) usage of information collected during the analysis for internal and external users purposes.

The recommended methodology of complex analysis of profitability can be successfully applied to companies of various size and activity. After successfully applying it, it is possible to objectively assess efficiency of company's activity, potential risks, competitiveness and possibilities of continuity.

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