# TURNOVER RATIOS AND PROFITABILITY RATIOS CALCULATION METHODS: THE BOOK OR AVERAGE VALUE

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**Abstract.** The scientific literature of the turnover ratios and profitability ratios calculation offers to use book or average value of balance sheet calculation methods. Different schools of financial analysis nowadays offer many variations of the ratio calculations and even though the components of ratio formulas change, the meaning stays the same.

The aim of this research is to analyze the turnover and profitability ratios, to study the different methods of calculation, based on different schools of financial analysis and empirical research results, and to create proposals for companies for the use of these methods for financial analysis.

The authors of this paper are using the international scientific literature, articles and research papers that help to study the measures of turnover and profitability ratios. For the empirical research, to compare the results using the book or average value of balance sheet calculations the authors have used the data from the annual statements of Latvian companies from different industries over a six-year period. In the research the authors have applied quantitative and qualitative research methods of economics such as the mathematical and the statistical methods, the ratio analysis, the graphical method, logically – constructive methods.

The result of done research shows that differences exist between using the book and average value calculation for turnover ratios and profitability ratios, but quantitative research during six-years period shows that results are uniform and parallel.

**Key words:** *ratios, analysis, book or average value*

**JEL code:** M41, M49

## Introduction

Financial analysis is broadly used by the companies to determine the financial results and performance. Financial analysis plays an important role when measuring corporate performance and financial management of the company. The financial aspect of the business activity of an enterprise firstly appears in the speed of turnover ratios. One of the important components of financial analysis of the company used by investors and creditors are profitability ratios of assets and equity. Profitability ratio of assets (ROA) indicates how profitable a company is relative to its total assets and illustrates competitiveness. Profitability ratio of equity (ROE) measures the ability of the company to generate profits from its shareholders' investments in the company.

Most of the authors of the scientific literature offer to use average instead of book value for profitability and turnover ratio calculation. Different schools of financial analysis nowadays offer many variations of the ratio calculations and even though the components of ratio formulas change, the meaning stays the same.

The aim of this research is to analyze the turnover and profitability ratios, to study the different methods of calculation, based on different schools of financial analysis and empirical research results, and to create proposals for companies for the use of these methods for financial analysis.

The paper consists of two parts: theoretical, where the variation of ratios calculation is described and the authors offer abbreviations for Latvian users for fast and convenient application, and practical, where the authors compare book or average methods calculation in practice, based on nine large scale Latvian manufacturing companies from different industries, whose shares are quoted at the Baltic exchange, over a six-year period.

The following research can be used not only for the main financial analyzes users, but also in financial science.

The research tasks are as follows:

- to analyze the turnover and profitability interpretations by different schools of financial analysis, to choose the most popular turnover ratios interpretations from fourteen researchers of financial analysis from American, British, Russian, German and French schools;
- to offer the most commonly used and user friendly the turnover and profitability ratios interpretations;
- to propose an option of turnover and profitability ratios abbreviation that could be used conveniently by financial analyses users in Latvia;
- based on the scientific literature, to compare the book and average value of calculation of the turnover and profitability ratios;

After having analyzed fourteen scientific sources of different financial analysis schools, the authors of this research offer the most widespread turnover and profitability ratio interpretations and the use of ratio abbreviations for more convenient calculations.

The result of done research shows that differences exist between using the book and average value calculation for turnover ratios and profitability ratios, but quantitative research during six-year period shows that results are uniform and parallel.

As for the conclusions, turnover and profitability ratios calculation can be used as the book or average value, as based on the authors research the results are the same, but the authors offer to use the book value because it is the same exact as average value, but less time and data consuming.

## Theoretical approaches of calculation book or average value for turnover and profitability ratios

Accounting statements reflect events that happened in the past, but they also provide clues about what's really important - what's likely to happen in the future. The asset management, and debt ratios covered thus far tell us something about the firm's policies and operations.

Based on previous research carried out by the authors where large and medium-sized Latvian companies were selected in different types of fields of activity, the most commonly used turnover ratios have been revealed and analyzed.

*Assets turnover* ratios show how effectively the firm is managing its assets. Activity or turnover ratios are measures of efficiency and, generally, the higher the better. Typically, the numerator is an operating measure such as sales (revenues) or cost of goods sold and the denominator is a balance sheet measure such as inventory or receivables. Thus, operating flows are measured against asset and other levels. Time series trends and comparisons to other companies are useful to spot red flags or potential opportunities (Giroux G., 2003).

The authors chose the most frequently used turnover and profitability ratios, where book or average value can be used, and analyzed those in the theoretical part as well as made empirical calculations.

The authors of this paper offer definitions for each explorer ratio:

*Accounts receivable turnover ratio* shows the proportion of accounts receivable needed for a given sales volume, which indicates if the receivables are being collected in a timely manner.

*Inventory* is frequently the largest component of a company's working capital; in such situations, if inventory is not being used up by operations at a reasonable pace, then the company has invested a large part of its cash in an asset that may be difficult to liquidate in short order (Bragg S. M., 2007).

*Accounts payable turnover* reveals if payments are being made in a timely manner. A low turnover ratio means that either payment terms are very long or payables are not being paid on time (Bragg S. M., 2014).

*Fixed assets turnover ratio*, which is the ratio of sales to net fixed assets, measures how effectively the firm uses its plant and equipment (Brigham E.F., 2016).

In the Table 1. and 2. the authors summarized fourteen scientists' turnover and profitability ratio interpretations – book or average value, terminology formulating the difference in the way of ratio calculation. This was based on the financial analyses of: American, British, Russian, German and French schools.

Table 1

**Summary of Different Financial Analyses Schools of the Terminology Use the Turnover Ratios, the Book or Average Value**

| Nr. | Authors/ Financial Ratios Terminology | CFA Institute USA | CIA Institute USA | Dybal S. V. | Sheremet A. D. Negashev E.V. | Giroux G. | Richard Z. | Kovalov V. V. | Bernstein L. | Bragg S. | Brigham E. | Helfert E. | Higgins R. | Palepu K. | Jefimova O. V. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| *1.* | *Accounts Receivable Turnover Ratio* | | | | | | | | | | | | | | |
| 1.1. | Sales | | | | | X | | | | | | | X | X | |
| 1.2. | Net Sales | | | | X | | X | | | X | X | X | | | |
| 1.3. | Net Credit Sale | | | | | | | | X | | | | | | X |
| 1.4. | Accounts Receivable | | | | | | | | X | X | | X | X | X | |
| 1.5. | Total Revenue | X | X | X | | | | X | | | | | | | |
| 1.6. | Average Accounts Receivable | X | X | X | X | X | X | X | | | X | | | | X |
| *2.* | *Inventory Turnover Ratio* | | | | | | | | | | | | | | |
| 2.1. | Sales | | | | | | | | | | | | | | X |
| 2.2. | Net Sales | | | X | X | | | | X | | | X | | | |
| 2.3. | Costs of Goods Sold | X | X | X | X | X | X | X | | X | X | X | X | X | X |
| 2.4. | Inventory | | | | | | X | | | X | | | X | X | |
| 2.5. | Average Inventory | X | X | X | X | X | | X | X | | X | X | | | X |
| *3.* | *Accounts Payable Turnover Ratio* | | | | | | | | | | | | | | |
| 3.1. | Cost of Goods Sold | X | X | X | | | X | X | | | | | X | X | X |
| 3.2. | Sales | | | | | X | | | | | | | | | |
| 3.3. | Net Sales | | | | X | | | | | | X | X | | | |
| 3.4. | Total Purchases | | | | | | | | X | X | | | | | |
| 3.5. | Accounts Payable | | | | | | X | | | X | | X | X | X | |
| 3.3. | Average Accounts Payable | X | X | X | X | X | | X | X | | X | | | | X |
| *4.* | *Fixed Assets Turnover Ratio* | | | | | | | | | | | | | | |
| 4.1 | Sales | | | | | X | | | X | | X | | X | X | X |
| 4.2. | Net Sales | | | X | X | | X | X | | X | | X | | | |
| 4.3. | Total Revenue | X | X | | | | | | | | | | | | |
| 4.4. | Fixed Assets | | | | | | X | | | X | X | X | | | |
| 4.5. | Average Fixed Assets | X | X | X | X | X | | X | X | | | | X | X | X |

*Source: author's construction based on CFA Institute USA, 2017, CIA Institute USA, 2016, Dybal S.V., 2009, Giroux G.,2003, Kovalov V.V., 2016, Bernstein L.,2000, Bragg S., 2014, Brigham E., 2016, Helfert E., 2010, Higgins R. 2016, Palepu K., 2007, Richard Z., 2000, Jefimova O. V. 2002, Sheremet A.D. and Negashev E.V., 2013.*

Comparing different variations of calculations in Table 1, the authors have concluded: that American and Russian schools of financial analyses terminology are similar, but British, German and France schools differ, of its standards in use GAAP (Generally Accepted Accounting Principles) or IFRS (International Financial Reporting Standards).

The simplest turnover calculation is to divide the period-end inventory into the annualized cost of sales. One can also use an average in the inventory level that are likely to occur on any specific period-end date (Bragg S. M., 2014).

Note that sales occur over the entire year, whereas the inventory figure is for one point in time. For this reason, it might be better to use an average inventory measure. If the business is highly seasonal or if there has been a strong upward or downward sales trend during the year, it is especially useful to make an adjustment (Brigham E.F., 2016).

We will also look at the profitability ratios, which reflect the net result of companies' financing policies and operating decisions.

Profit is the most important criterion for evaluating commercial firms for investment decisions. The most significant predictor of firm market valuation is profitability and the likelihood of continuous profit growth. Thus, the future existence and success of corporations depends on this analysis (Giroux G. 2003).

Consequently, there are several profitability ratios that consider different aspects of earnings performance.

*Profitability ratios,* which give an idea of how profitably the firm is operating and utilizing its assets. Satisfactory liquidity ratios are necessary if the firm is to continue operating. Good asset management ratios are necessary for the firm to keep its costs low and thus its net income high (Brigham, E.F., 2016).

Profitability ratios combine the asset and debt management categories and show their effects on *Return on Equity*. Finally, market value ratios tell us what investors think about the company and its prospects. All of the ratios are important, but different ones are more important for some companies than for others.

*Return on Equity* (ROE) this calculation is used by investors to determine the amount of return they are receiving from their capital investment in a company.

*Return on Assets* (ROA) a company is deemed efficient by investors if it can generate an adequate return while using the minimum amount of assets to do so (Bragg S. M., 2014).

As the size of equity changes in time, it is necessary to choose a way of its calculation which can be:

- calculation for data on its state for concrete date (the end of the period);
- determination of average size for the period.

It is simple to notice that for profitably the working enterprise the second option provides more good result (it, as a rule, appears also more exact as to some extent reflects process of formation of profit during the analyzed period).

In the analysis it is necessary to adhere to the chosen way of calculation to provide an opportunity for profitability indicators in dynamics (Jefimova O.V., 2002).

Table 2

**Summary of Different Financial Analyses Schools of the Terminology Use the Return on Equity and Return on Assets Ratios, the Book or Average Value**

| Nr. | Authors/ Financial Ratios Terminology | CFA Institute USA | CIA Institute USA | Dybal S.V. | Sheremet A. D. Negashev E.V. | Giroux G. | Richard Z. | Kovalov V.V. | Bernstein L. | Bragg S. | Brigham E. | Helfert E. | Higgins R. | Palepu K. | Jefimova O. V. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| *1.* | *ROE Return on Equity Ratio* | | | | | | | | | | | | | | |
| 1.1. | Net Profit | | X | X | | | X | X | X | | X | X | | X | X |
| 1.2. | Operating Profit | X | | | X | | | | | | | | | | |
| 1.3. | Net Income | | | | | X | | | | X | | | X | | |
| 1.4. | Equity | | | | | | | X | | | X | | X | X | X |

| Nr. | Authors/ Financial Ratios Terminology | CFA Institute USA | CIA Institute USA | Dybal S.V. | Sheremet A. D. Negashev E.V. | Giroux G. | Richard Z. | Kovalov V.V. | Bernstein L. | Bragg S. | Brigham E. | Helfert E. | Higgins R. | Palepu K. | Jefimova O. V. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.5. | Average Equity | X | | X | X | | X | | X | | | | | | |
| 1.6. | Average Shareholders' Equity | | X | | | X | | | | | | | | | X |
| 1.7. | Total Equity | | | | | | | | | X | | | | | |
| 1.8. | Shareholders' Investment | | | | | | | | | | | X | | | |
| 1.9. | Average Shareholders' Investment | | | | | | | | | | | X | | | |
| | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| *2.* | *ROA Return on Assets Ratio* | | | | | | | | | | | | | | |
| 2.1. | Net Income | | | | | X | | | | | | | X | X | |
| 2.2. | Net Profit | X | X | X | X | | | | | X | X | X | | | X |
| 2.3. | Net Profit + Interest | | | | | | X | X | X | | | | | | |
| 2.4. | Total Assets | | | | X | | | X | | X | X | | X | X | |
| 2.5. | Average Total Assets | X | X | X | | X | X | | X | | | X | | | X |

*Source: author's construction based on CFA Institute USA, 2017, CIA Institute USA, 2016, Dybal S.V., 2009, Giroux G.,2003, Kovalov V., 2016, Bernstein L.,2000, Bragg S., 2014, Brigham E., 2016, Helfert E., 2010, Higgins R. 2016, Palepu K., 2007, Richard Z., 2000, Jefimova O. V., 2002, Sheremet A.D. and Negashev E.V., 2013.*

In Table 1 and 2, where the researchers have analyzed fourteen scientific sources, it can be concluded that, the most appropriate comparison is the average balance sheet measure for the denominator. The operating measures occur over the fiscal period.

From Tables 1 and 2 the authors of this paper conclude that there is a different terminology formulation, which is connected with different applications of standards Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS).

Comparing fourteen scientific sources in Tables 1 and 2, in Table 3 the authors offer to use the popular ratios in the most widespread interpretation, which can be used as in book as well as in average value ratio calculations.

Table 3

**The Turnover and Profitability Ratios Calculation Methods: The Book or Average Value**

| Nr. | Ratios | | Book Value | Average Value |
|---|---|---|---|---|
| **1** | $\mathbf{A_1}$ | **Accounts Receivable Turnover** | Net Sales / Accounts Receivable **$A_1$= NA / DP Atl** | Net Sales / Average Accounts Receivable **$A_1$= NA / DP vid Atl** |
| **2** | $\mathbf{A_2}$ | **Inventory Turnover** | Net Sales / Inventory **$A_2$ = NA / K Atl** | Net Sales / Average Inventory **$A_2$ = NA / K vid Atl** |
| **3** | $\mathbf{A_3}$ | **Accounts Payable Turnover** | Cost of Goods Sold / Accounts Payable **$A_3$ = PPRI / Kr Atl** | Cost of Goods Sold / Average Accounts Payable **$A_3$ = PPRI / Kr vid Atl** |
| **4** | $\boldsymbol{A_4}$ | **Fixed Assets Turnover** | Net Sales / Fixed Assets **PA = NA / P Atl** | Net Sales / Average Fixed Assets **PA = NA / P vid Atl** |
| **5** | $\mathbf{R_1}$ ***ROA*** | **Return on Assets %** | Net Profit/ Assets x 100 **$R_2$=NP/ A x 100** | Net Profit/ Average Assets x 100 **$R_2$=NP/ A vid x 100** |

| | | | | |
|---|---|---|---|---|
| **6** | **$R_2$** ***ROE*** | **Return on Equity %** | Net Profit/ Shareholders' Equity x100 **$R_1$=NP / PK x 100** | Net Profit/ Average Shareholders' Equity x100 **$R_1$=NP / PK vid x 100** |

*Source: table made by the authors of this paper*

***$A_1$*** *– Accounts Receivable turnover;* ***$A_2$*** *- Inventory Turnover;* ***$A_3$*** *– Accounts Payable Turnover;* ***$A_4$*** *– Fixed Assets Turnover;* ***NA*** *– Net Sales;* ***DP Alt-*** *Accounts Receivable;* ***PPP -****; Trade Receivable;* ***UI -*** *Accrued Income;* ***K Atl*** *– Inventory;* ***PTII*** *- Non - Current Assets Held for Sale and Discontinued Operations;* ***PPRI*** *- Cost of Goods Sold;* ***Kr Atl -*** *Accounts Payable;* ***PPD*** *- Trade Accounts Payable;* ***US -*** *Accrued Liabilities;* ***P Atl*** *- Fixed Assets;* ***IĪ -*** *Investment properties;* **$R_1$** *- Return on Equity;* **$R_2$** *- Return on Assets;* **NP** *- Net Profit;* **PK** *- Shareholders' Equity;* **A** *– Assets;*

In Table 3 the authors have made the abbreviation for turnover and profitability ratios to provide more convenience for Latvian users.

As to the suggestion of which method – book or average, is more exact and if significant differences between the calculated results using two variations, the authors of this paper will discuss in the next chapter.

## Turnover and profitability ratios calculation – book or average value

For empirical study the authors analyzed the financial statements of nine Latvian companies, whose business orientation is manufacturing. Profitability, ROA *Return on Assets,* ROE *Return on Equity,* and turnover ratios, which are described in Table 3 *Accounts Receivable Turnover, Inventory Turnover, Accounts Payable Turnover, Fixed Assets Turnover,* were calculated from balance sheets and income statements in the period of 2012-2017 for each company. In total 324 ratios were calculated (the six ratios for each company) using book value and 324 using average value.

The authors for the empirical analyzes have chosen nine manufacturing companies which are quoted at the *Nasdaq Baltic* exchange of different spheres: pharmaceuticals, telecommunications equipment, alcoholic beverages, ships, train's equipment, glass fiber and vehicle components. *AS Grindex, AS Olainfarm, AS SAF Tehnika* are in Baltic Main List of exchange and other are in Baltic Secondary List: *AS Valmieras stikla škiedra, AS Rīgas elektromašīnbūves rūpnīca, AS VEF Radiotehnika RRR, AS Rīgas kuģu būvētava, AS Latvijas balzams, AS Ditton pievadķēžu rūpnīca.* The *Baltic Main List* of the exchange demand from companies consolidated reports, but for Baltic Secondary List allowed be prepared according to local accounting standards. That's why *AS VEF Radiotehnika RRR, AS Rīgas kuģu būvētava, AS Ditton pievadķēžu rūpnīca* reports were made by Latvian accounting standards.

Due to the limited amount of information that can be incorporated in this article, the authors show only one ratio calculation per group from the whole large-scale research – book or average turnover and profitable ratios calculation.

In Table 4 and Table 5 the authors show the results of *Accounts Receivable Turnover Ratio* and *Return on Equity* ratio comparing book and average value calculation.

For a lot of companies selling on credit is an important part of working capital.

Table 4

**Accounts Receivable Turnover Ratio Calculation - Book or Average Value**

| Production enterprise | AS Grindex | AS Olainfarm | AS SAF Tehnika | AS Valmieras stikla šķiedra | AS Rīgas elektromašīnbūves rūpnīca | AS VEF Radiotehnika RRR | AS Rīgas kuģu būvētava | AS Latvijas balzams | AS Ditton pievadķēžu rūpnīca | Performance indicators modification |
|---|---|---|---|---|---|---|---|---|---|---|
| **Nr.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **2012** | 2,75 | 2,50 | 7,67 | 7,70 | 19,32 | 5,43 | 55,38 | 111,76 | 1,85 | Net Sales/Accounts Receivable |
| | *3,10* | *3,08* | *6,41* | *8,00* | *9,88* | *3,99* | *65,02* | *106,21* | *2,60* | *Net Sales/Average Accounts Receivable* |
| | ***-0,35*** | ***-0,58*** | ***1,27*** | ***-0,30*** | ***9,44*** | ***1,44*** | ***-9,64*** | ***5,55*** | ***-0,75*** | ***Difference*** |
| **2013** | 3,14 | 2,40 | 5,10 | 7,00 | 10,00 | 36,24 | 14,42 | 112,26 | 1,23 | Net Sales/Accounts Receivable |
| | *3,03* | *2,40* | *6,06* | *8,09* | *12,66* | *8,00* | *12,85* | *115,05* | *1,24* | *Net Sales/Average Accounts Receivable* |
| | ***0,11*** | ***0,01*** | ***-0,95*** | ***-1,09*** | ***-2,65*** | ***28,24*** | ***1,57*** | ***-2,79*** | ***-0,01*** | ***Difference*** |
| **Nr.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **2014** | 2,28 | 3,04 | 6,36 | 9,28 | 14,38 | 6,69 | 9,94 | 49,62 | 3,31 | Net Sales/Accounts Receivable |
| | *2,21* | *3,01* | *5,34* | *8,97* | *11,79* | *10,53* | *6,42* | *60,82* | *3,09* | *Net Sales/Average Accounts Receivable* |
| | ***0,06*** | ***0,03*** | ***1,02*** | ***0,32*** | ***2,59*** | ***-3,84*** | ***3,52*** | ***-11,19*** | ***0,21*** | ***Difference*** |
| **2015** | 1,77 | 3,17 | 12,87 | 14,58 | 8,21 | 0,82 | 12,20 | 117,98 | 9,09 | Net Sales/Accounts Receivable |
| **Nr.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| | *1,85* | *3,17* | *8,62* | *14,65* | *6,64* | *5,74* | *12,54* | *70,36* | *3,74* | *Net Sales/Average Accounts Receivable* |
| | ***-0,08*** | ***0,01*** | ***4,25*** | ***-0,07*** | ***1,57*** | ***-4,92*** | ***-0,34*** | ***47,62*** | ***5,35*** | ***Difference*** |
| **2016** | 2,32 | 3,01 | 11,21 | 11,96 | 11,04 | 1,24 | 13,02 | 83,33 | 5,16 | Net Sales/Accounts Receivable |
| | *2,26* | *3,20* | *12,17* | *12,40* | *11,81* | *8,68* | *12,73* | *98,71* | *6,93* | *Net Sales/Average Accounts Receivable* |
| | ***0,05*** | ***-0,19*** | ***-0,96*** | ***-0,43*** | ***-0,76*** | ***-7,43*** | ***0,29*** | ***-15,38*** | ***-1,77*** | ***Difference*** |
| **2017** | 3,25 | 3,36 | 21,33 | 17,32 | 57,41 | 5,01 | 30,05 | 71,17 | 7,12 | Net Sales/Accounts Receivable |
| | *3,07* | *3,19* | *20,82* | *19,19* | *24,13* | *7,00* | *12,81* | *77,94* | *5,24* | *Net Sales/Average Accounts Receivable* |
| | ***0,17*** | ***0,18*** | ***0,51*** | ***-1,87*** | ***33,28*** | ***-1,99*** | ***17,23*** | ***-6,77*** | ***1,88*** | ***Difference*** |

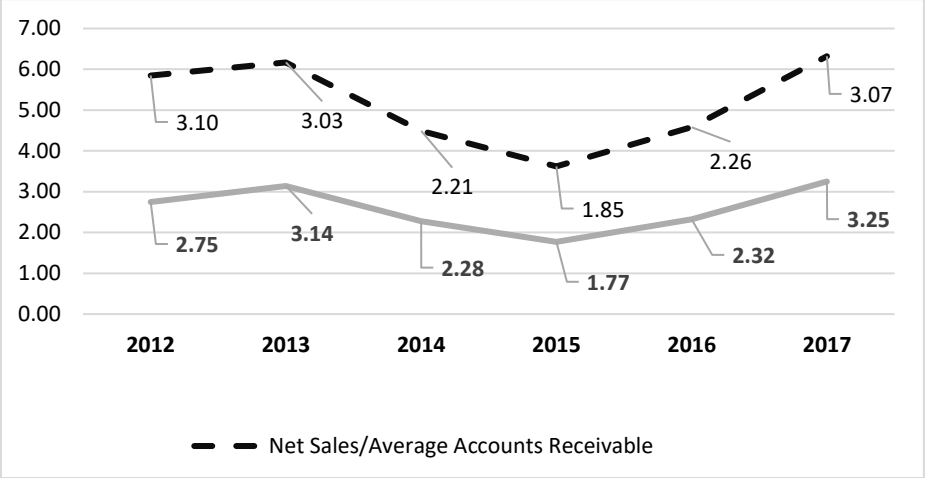
*Source: author's calculations based on Nasdaq Baltic data*

From Table 4 the authors can suggest that difference between *Accounts Receivable Turnover Ratio* book and average value calculation exist and sometimes the difference is quite huge, it can depend on several reasons:

- seasonable reasons;
- the sales volume, with growth of sales volume the debit debt grows;
- conditions of settling with buyers and customers, the more preferential terms of calculations are provided to buyers, the remainder of a debit debt are higher;
- the creditor's policy of debt collection, the more active the enterprise in collecting debt, the less its rest.

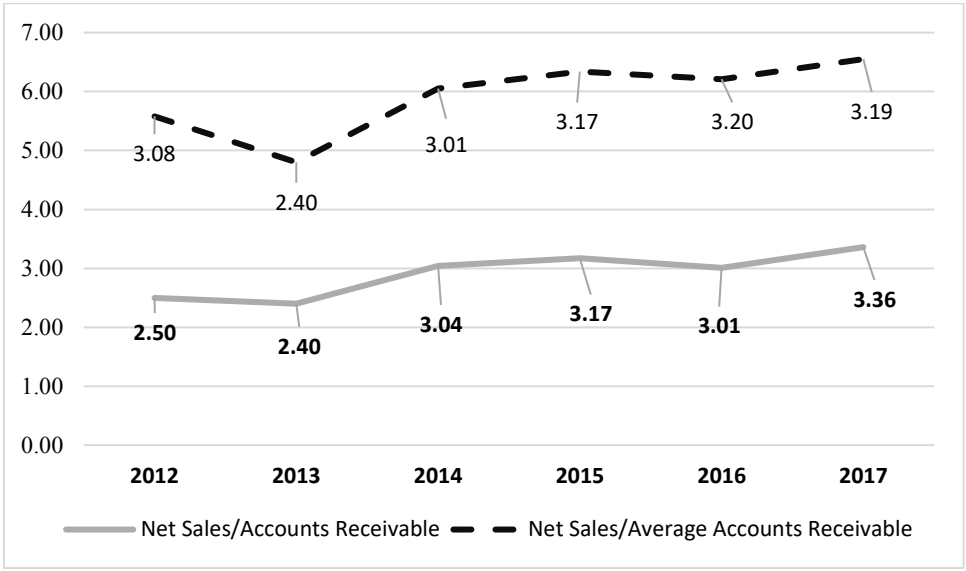
The difference between book and average accounts receivable are observed in *AS VEF Radiotehnika RRR* in year 2013 is 28,24, the *Average Accounts Receivable* was 36,24, but book value 8,00, this indicates that perhaps the company changed conditions of selling on credit. While analyzing the data from *AS Latvijas balzams* the authors suggest that either the growth sales volume has increased or the company does not practice selling on credit.

From the compared data, the authors have concluded that the average value calculation is more favorable in some cases for the financial analysis than the book value, the results are bigger.




*Source: author's calculations based on Nasdaq Baltic data*

Fig. 1. **AS "Grindex" Accounts Receivable Turnover Ratio- Book or Average**




*Source: author's calculations based on Nasdaq Baltic data*

Fig. 2. **AS "Olainfarm" Accounts Receivable Turnover Ratio– Book or Average**

In Figure 1 and 2 the authors analyzing the tendency of *Accounts Receivable Turnover Ratio* calculations comparing book and average value. AS Grindeks and AS Olainfarm are both medical product manufacturers.

Analyzing Table 4, AS Grindeks and AS Olainfarm, *Accounts Receivable Turnover Ratios* show that a difference between book and average accounts receivable is observed, but if analyzing the trends of calculation results of the last six years, the same ratios show the same trends of change.

Capital investors (shareholders) make in the investments in the enterprise for the purpose of receiving profit on investments, therefore from the shareholders' point of view the most important assessment of efficiency of investment of capital is the return of it.

As the size of equity changes with time, it is necessary to choose a way for measuring it, which can be:

- calculation of data at a certain date (end of the period);
- determination of the average size for the period.

It is easy to notice that for profitably of the working enterprise the second option provides better results (it, as a rule, appears also more exact as to some extent it reflects process of formation of profit during the analyzed period).

In the analysis it is necessary to adhere to the chosen way of calculation to provide an opportunity for profitability indicators in dynamics (Jefimova O.V., 2002).

Return on Equity calculation is used by investors to determine the amount of return they are receiving from their capital investments in a company. This is a commonly used measure, but can be misleading, as discussed under the Cautions section.

A management team that is eager to increase a company's return on equity can easily do so by incurring new debt and using these funds to buy back stock. Although the amount of equity is thereby reduced, making the ratio more favorable, the company also has an obligation to pay back the debt and related interest. An overly zealous pursuit of this approach can result in such a large debt load that a small downturn in sale will not allow it to pay off the debt, possibly ending in bankruptcy. An astute investor should combine this ratio with an analysis of how much debt a company has incurred, as well as its interest cost (Bragg S.M., 2007).

Table 5

**Return on Equity Ratio Calculation (ROE) - Book or Average Value (%)**

| **Production enterprise** | AS Grindex | AS Olainfarm | AS SAF Tehnika | AS Valmieras Stikla Šķiedra | AS Rīgas elektromašīnbūves rūpnīca | AS VEF Radiotehnika RRR | AS Rīgas kuģu būvētava | AS Latvijas balzams | AS Ditton pievadķēžu rūpnīca | **Performance indicators modification** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Nr.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **2012** | 10,29 | 27,50 | 8,23 | 8,43 | 56,13 | 7,23 | 0,65 | 8,02 | 0,04 | Net Profit/Shareholders' Equity |
| | *10,85* | *31,45* | *8,19* | *8,71* | *77,97* | *6,97* | *0,65* | *8,36* | *0,04* | *Net Profit/Average Shareholders' Equity* |
| | ***-0,56*** | ***-3,95*** | ***0,04*** | ***-0,28*** | ***-21,84*** | ***0,27*** | ***0,00*** | ***-0,34*** | ***0,00*** | ***Difference*** |
| **2013** | 8,69 | 20,56 | -0,20 | 10,70 | 19,45 | 13,54 | -0,21 | 7,18 | 0,56 | Net Profit/Shareholders' Equity |
| | *9,09* | *22,49* | *-0,20* | *11,14* | *26,97* | *9,87* | *-0,21* | *7,54* | *0,56* | *Net Profit/Average Shareholders' Equity* |
| | ***-0,39*** | ***-1,93*** | ***0,00*** | ***-0,43*** | ***-7,51*** | ***3,66*** | ***0,00*** | ***-0,35*** | ***0,00*** | ***Difference*** |
| **2014** | -3,29 | 15,46 | 1,15 | 14,02 | 0,23 | -19,52 | -3,53 | 10,04 | -47,64 | Net Profit/Shareholders' Equity |
| | *-0,77* | *16,75* | *1,15* | *14,88* | *0,23* | *-16,62* | *-3,46* | *10,56* | *-37,72* | *Net Profit/Average Shareholders' Equity* |
| | ***-2,51*** | ***-1,29*** | ***-0,01*** | ***-0,85*** | ***0,00*** | ***-2,90*** | ***-0,06*** | ***-0,52*** | ***-9,92*** | ***Difference*** |
| **2015** | -0,79 | 16,47 | 10,72 | 10,42 | -1,03 | 13,67 | 0,71 | 8,49 | -468,64 | Net Profit/Shareholders' Equity |
| | *-0,79* | *17,94* | *11,24* | *10,76* | *-1,15* | *2,46* | *0,71* | *8,69* | *-138,75* | *Net Profit/Average Shareholders' Equity* |
| | ***0,00*** | ***-1,48*** | ***-0,51*** | ***-0,34*** | ***0,12*** | ***11,21*** | ***0,00*** | ***-0,20*** | ***-329,89*** | ***Difference*** |
| **2016** | 7,83 | 10,09 | 7,88 | 10,00 | 1,12 | 128,35 | 0,54 | 7,76 | 10,68 | Net Profit/Shareholders' Equity |
| | *8,15* | *10,48* | *7,84* | *9,96* | *1,12* | *429,64* | *0,54* | *8,31* | *10,74* | *Net Profit/Average Shareholders' Equity* |
| | ***-0,32*** | ***-0,39*** | ***0,04*** | ***0,04*** | ***-0,01*** | ***-301,29*** | ***0,00*** | ***-0,55*** | ***-0,05*** | ***Difference*** |
| **2017** | 9,96 | 9,70 | 14,02 | 8,91 | 1,87 | 226,11 | -1,01 | 8,24 | 59,63 | Net Profit/Shareholders' Equity |
| | *10,41* | *9,70* | *14,42* | *9,33* | *1,95* | *-1016,44* | *-1,00* | *8,59* | *84,96* | *Net Profit/Average Shareholders' Equity* |
| | ***-0,45*** | ***0,00*** | ***-0,40*** | ***-0,42*** | ***-0,08*** | ***1242,56*** | ***-0,01*** | ***-0,35*** | ***-25,33*** | ***Difference*** |

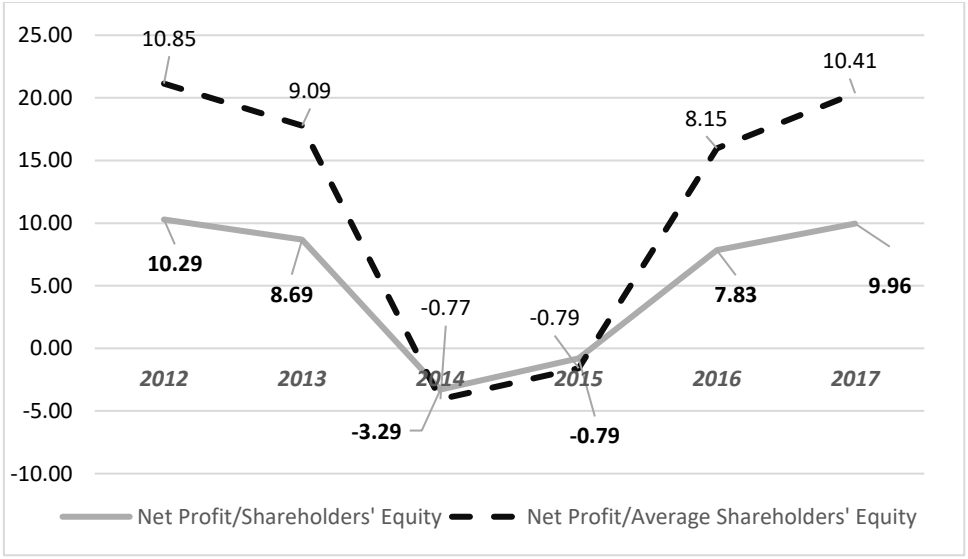
*Source: author's calculations based on Nasdaq Baltic data*

In Table 5 the authors analyze *Return on Equity* book or average value of calculation.

Analyzing the trends of Return on Equity (ROE) calculations, the authors can conclude, that using book or average value calculation for ROE in some cases it can be difference 0,00, like *AS Ditton pievadķēžu rūpnīca.* But in some cases, there can be a significant difference between using book or average value, as *AS VEF Radiotehnika RRR* in 2017-year analyses. But in most examples in Table 5 *Average Shareholders' Equity* is higher than the book value *Shareholders' Equity*.

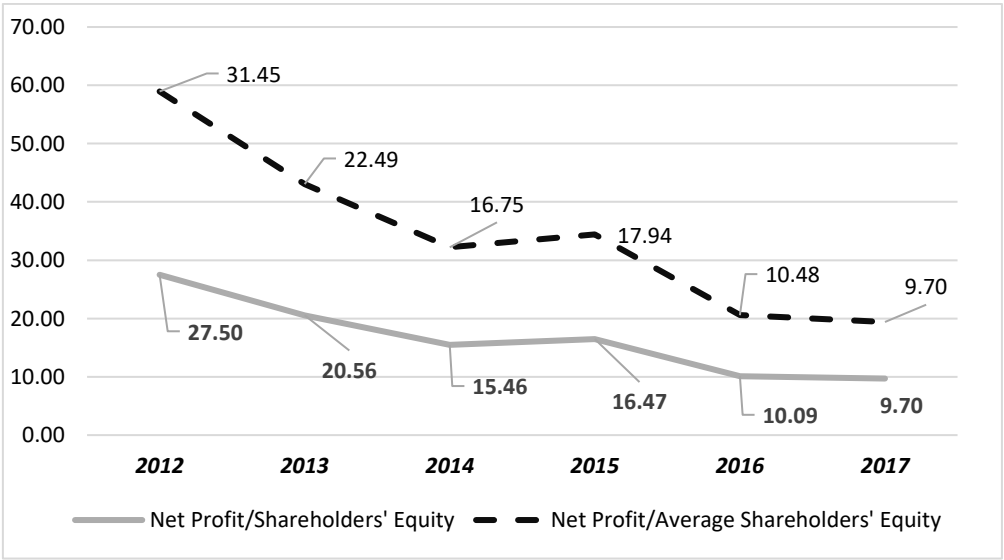
It means that using the average methods of calculation the results of the ratios of ROE are higher than book value methods.

In Figure 3 and 4 the authors show various book or average *Return on Equity* ratios calculation trends, to conclude which method is more exact. If it is reasonable to use average value methods instead book value methods, the tendency of both methods is parallel, which can be the reason to choose book value instead of average calculation method. Book value method ratios calculation is less expensive and saves time.




*Source: author's calculations based on Nasdaq Baltic data*

Fig. 3. **AS "Grindex" Return on Equity (ROE) - Book or Average value (%)**




*Source: author's calculations based on Nasdaq Baltic data*

Fig. 4 **AS "Olainfarm" Return on Equity (ROE) - Book or Average value (%)**

From AS "Olainfarm" or AS" Grindex" calculation of *Return on Equity* results, the authors conclude – the trend of ratios book or average calculation methods are parallel, what confirms in Figures 3 and 4 ratios analyzes for six years.

## Conclusions

The theoretical and practical results of this research can be useful not only for main financial analyses users: shareholders, investors, management, but also in the scientific World of financial analysis. The first part of this paper is theoretical, where more theoretical problems of terminology and calculation methods analyses are described. In the second part of the paper the authors compare data, of nine Latvian manufacturing companies of different areas of industry – to check differences between book and average methods calculation.

While analyzing the results of the current research, authors have come to the following conclusions:

1. To analyze the turnover interpretations by different schools of financial analysis the authors suggest using various terminology for the same ratios as different terminology is used in different countries to describe the same thing, same with GAAP or IFRS standards, theoretical material for the ratios′ calculation should be carefully interpreted. The authors offer to use IFRS standard for the terminology for ratios as it is user friendly for the local Latvian users.
2. After empirical analyzes of fourteen scientific sources of main schools of financial analyses, the authors of this research suggest to use the most popular interpretation of four Turnover Ratios: *Accounts Receivable, Inventory, Accounts Payable and Fixed Assets,* and two Profitability Ratios: *Return on Assets (ROA) and Return on Equity (ROE).* The authors have chosen these basic ratios, to compare book or average methods calculation, as these are the most common ratios being used by large and medium sized companies in Latvia, according to previous research.
3. Studying scientific literature and articles of the theoretical guidelines for the turnover and profitability ratios calculations the authors have decided to offer coefficient abbreviations of formulas for convenient use for the Latvian users of daily financial analyses - theoretical material for the ratio′s calculation should be carefully interpreted.
4. Studying scientific, literature of the theoretical guidelines, of fourteen researchers, for turnover and profitability ratios calculation, the authors conclude, that most of the analyzed scientific sources offer to use the average value of ratios calculation.
5. In the second part of this research the authors calculated and compared all of the analyzed ratios, but due to size limitations of this research paper - show only *Accounts Receivable Turnover* and *Return on Equity Ratio* empirical results of Latvian manufactory company′s calculations. The average value results calculation in most cases are higher than the book value.
6. Based on the empirical analyses, where nine Latvian, manufacturing companies - large and medium size, were analyzed during a six-year period, the authors have concluded, that the tendency between book and average methods of ratios calculations are different, but the results of trends, during this period are parallel.

## Proposals

1. The authors propose to use book value ratios methods of calculation, to save time and resources.
2. To continue the current research and to carry out empirical analyses of different industries in Latvia. In the perspective research the authors offer the matrix for the main financial analyses′ users: shareholders, investors and management for difference industries of Latvian large and medium sized companies, for more exact and operational data analyzes.

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