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# **THE ANALYSIS OF THEORETICAL APPROACHES FOR CALCULATING TURNOVER RATIOS**

JEL classification: M41, M49

## ***Abstract***

*The methods of financial analysis are widely used to estimate a company's financial position and results of business activities. Studying scientific literature of the theoretical guidelines for the financial statement analysis we can find different approaches. The aim of the research is to study methods of turnover financial ratios calculations and basing on the empirical research findings to develop the recommendations for improvement the methods for it. The authors of this paper are studying theoretically different scientist's findings for using book value or average value of balance sheet analyzing such important ratios as turnover of companies. For the empirical research the data from annual statements of Latvian companies of manufacturing and trade branches are used. In the research the authors have applied quantitative and qualitative methods of economics such as the mathematical and the statistical methods, the ratio analysis, the graphical method, the logically – constructive methods. At the end of the research the authors give the summary of general conclusions and findings.*

**Key words:** *accounting, analysis, methods, turnover*

## **1. INTRODUCTION**

Anyone making economic decisions for company development needs the information about the financial position, performance and changes in financial position of it. Those information are provided by accounting.

So we often can hear that accounting is the language of business. It is the vehicle for communicating financial information about company to many different groups of users of accounting data – creditors, investors, suppliers, managers, owners, government agencies and others analysts. Every user needs different financial information of a company, but they all use methods of financial analysis. Financial analysis means different things to practitioners across a wide range of industries, disciplines, regulatory authorities and standard setting bodies (Brammertz and etc., 2009).

To decide what ratios to analyze an analyst must the first decide what kind of financial information he needs to know about a company. The main question for assessing the performance of companies is to indicate the efficiency of usage of the assets in producing cash flow and profits.

Studying scientific literature of the theoretical guidelines for the financial analysis we can find different approaches. Calculating financial ratio of assets turnover, some scientists have recommended to

use average value, others –book value of assets. Using the different approaches for calculation financial ratios it is important to know, if there are significant differences between the calculated results.

The aim of the research is to study methods of turnover financial ratios calculations and basing on the empirical research findings to develop the recommendations for improvement the methods for it. The methodological bases are scientific and training literature, statistical data and accessible Annual reports of manufacturing and trade branches of Latvian companies.

The research period for data of annual statements is from 2008 till 2011, theoretical approaches have been investigated since 1997. In the research the quantitative and qualitative methods of economics such as the mathematical and the statistical methods, the ratio analysis, the graphical method, the logically – constructive methods have been applied.

## **2. THEORETICAL APPROACHES OF CALCULATION TURNOVER RATIOS**

The usefulness of accounting information in the decision – making processes of investors and creditors has been the subject of much academic research over the last 35 years (White and etc.,2003). When examining a balance sheet, an analyst will draw company-specific conclusions about the size, nature, and value of the assets listed, looking at relative proportions, and judging whether the company has a viable asset base. In a more overall sense, a few ratios are used to judge broad trends in resource utilization. Such ratios essentially involve turnover relationships and express, in various forms, the relative amount of capital used to support the volume of business transacted (Helfert, 1997).

Asset turnover is the one of driver of a company`s return on equity. Since firms invest considerable resources in their assets, using them productively is critical to overall profitability. In some industries, a key barrier to entry is the large amount of assets required to produce revenue (Brag, 2007).

A detailed analysis of asset turnover allows the analyst to evaluate the effectiveness of a firm`s investment management. Accounts receivable turnover, inventory turnover and accounts payable turnover allow the analyst to examine how productively the three principal components of assets are being used. Another area of investment management concerns the utilization of a firm`s long-term assets. Property, plant and equipment (PP&E) is the most important long-term asset in a firm`s balance sheet.

Catherina Gowthorpe notes that, where possible, the average assets figure over the year should be used. This is likely to give more consistent and representative result. External users of annual reports do not have access to monthly information with which to calculate an average, but opening and closing figures often give a reasonable approximation (Gowthorpe, 2008).

The formulas of calculating assets turnover recommended by K.G.Palepy, P.M.Healy and V.L.Bernard are following (Palepy and etc., 2004):

Accounts receivable turnover = Sales/ Accounts receivable (1)

Inventory turnover = Costs of goods sold/ Inventory (2)

Accounts payable turnover = Costs of goods sold / Accounts payable (3)

PP&E turnover = Sales/Net property, plant, and equipment (4)

The same approaches we can find in R.C.Higgins work (Higgins,2001).

However, G.White, A.Sondhi D.Fried and G.Friedlob have a different approach for calculation assets turnover. They notes, that the analyst`s primary focus should be the relationships indicated by the ratios, not the details of their calculation and we can suggest many adjustments to and modifications of these basic ratios. When one of the components of the ratio comes from the balance sheet and the other from the income statement, the balance sheet component is an average of the beginning and ending balances. In practise, some analysts use beginning or ending balances for such mixed ratios.

The formulas calculating assets turnover recommended by G.White A.Sondhi. D. Fried and G.Friedlob, are following (White and etc.,2003):

Inventory turnover = Costs of goods sold/Average Inventory (5)

Receivable turnover = Sales/ Average trade Receivable (6)

$$\begin{aligned} \text{Payable Turnover} &= \text{Purchases (Costs of goods sold + the change in inventory)} / \text{Average Accounts Payable} && (7) \\ \text{Fixed Asset Turnover} &= \text{Sales} / \text{Average Fixed Asset} && (8) \\ \text{Total Asset Turnover} &= \text{Sales} / \text{Average Total Asset} && (9) \end{aligned}$$

From Erich Helfert's point of view, the most commonly used ratio relate net sales to gross assets, or net sales to net assets. The measure indicates the size of the recorded asset commitment required to support a particular level of sales or, conversely, the sales dollars generated by each dollar of assets. The turnover ratios serves as one of several clues that, in combination, can indicate favourable or unfavourable performance. The assets turnover calculation is following (Helfert,2001):

$$\begin{aligned} \text{Sales to assets} &= \text{Net sales} / \text{Gross assets} && (10) \\ \text{Sales to net assets} &= \text{Net sales} / \text{Net assets}^1 && (11) \end{aligned}$$

The difference between the two sets of calculations lies in the choice of the assets total, that is whether to use gross assets or net assets. Using net assets eliminates current liabilities from ratio. Here the assumption is that current liabilities, which are mostly operational (accounts payable, current taxes due, current repayments of short-term debt, and accrued wages and other obligations) are available to the business as a matter of course. Therefore, the amount of assets employed in the business is effectively reduced by these ongoing operational credit relationships. This concept is especially important for trading firms, where the size of accounts payable owed suppliers is quite significant in the total balance sheet (Helfert,1997).

Among the assets of a company the inventories and accounts receivable are usually given special attention. The ratios used to analyze them attempt to express the relative effectiveness with which inventories and receivables are managed. The amounts as stated on the balance sheet are generally related to the single best indicator of activity levels, such as sales or cost of sales (cost of goods sold), on the assumption that a reasonably close relationship exists between assets and the indicator. In assessing the effectiveness of a companies inventory management, it's more common to use the number of times inventory has turned over during the period of analysis using the following formulas (Helfert,1997):

$$\begin{aligned} \text{Inventory turnover} &= \text{Net sales} / \text{Average inventory} && (12) \\ \text{Inventory turnover} &= \text{Costs of sales} / \text{Average inventory} && (13) \end{aligned}$$

Normally average inventories are used to make this calculation. At times, it may be desirable to use only ending inventories, especially in the case of rapidly growing firms where inventories are being built up to support steeply rising sales. When dealing with any manufacturing company, we also must be particularly aware of the problem of accounting measurements – so often encountered when using other analytical methods – because the stated value of inventories can be seriously affected by the specific cost accounting system employed( Helfert, 2001).

The analysis of accounts receivable is based on net sales and calculation is following (Helfert, 1997):

$$\text{Receivable turnover} = \text{Net sales} / \text{Accounts receivable} \quad (14)$$

The relation of accounts receivable to sales is governed by credit policies and collection methods.

Comparing the above mentioned scientists' approaches for computing assets turnover ratios, the authors of this paper concludes that there is some scientists who prefers assets book value at the end of the annual year, while the other recognizes average value of assets. Different terminology formulating types of assets, sales and costs for calculating ratios are used, too (Table 1).

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<sup>1</sup> Net assets = total assets less current liabilities, representing the capitalization of the business

Table 1

## Summary of scientists' approaches for computing assets turnover ratios

Types of assets, sales and costs	K.G.Palepy P.M. Healy V.L. Bernard, R.C.Higgins	G.White, A.Sondhi, D.Fried, G.Friedlob	E.A.Helfert
Accounts receivable	X		X
Average trade Receivable		X	
Accounts Payable	X		
Average Accounts Payable		X	
Average Inventory		X	X
Inventory	X		X
Costs of goods sold	X	X	
Costs of goods sold + the change in inventory		X	
Costs of sales			X
Net sales			X
Sales	X	X	
Net property, plant, and equipment	X		
Average Fixed Asset		X	
Average Total Asset		X	
Gross assets			X
Net assets			X

Source: Table made by the authors of this paper

To get the answer to the question - if significant differences between the calculated results using different approaches exist, the authors of this paper will study in the next chapter.

### 3. DATA COLLECTION FOR EMPIRICAL RESEARCH

For empirical study the financial statements of 10 Latvian companies, whose business orientation is manufacturing and trade, were used. Assets turnover ratios were calculated from Balance sheet and Income statement in the period of 2008 – 2011 of each company. Calculation average values of financial statements are made based on values at the end of the current year. Overall, were 40 ratios (the four ratio of each company) calculated using average value of assets and 40 ratios (the four ratio of each company) - using book value of assets. The same approaches for calculation receivables and inventory turnover were used.

Taking into account, that any business, large or small, can be described as a system of financial relationships, in the study an accidental random set of companies was used. The total assets book value of the analysed companies had from 133.7 to 1.0 million EUR.

### 4. ANALYSIS OF EMPIRICAL RESULTS

To achieve the aim of the current research, turnover ratios of assets, inventories and receivables were used. The formulas No 9 and No 10 for asset turnover were used, formulas No 2 and No 13 for the inventory turnover and formulas No 6 and No 14 for receivables turnover were used.

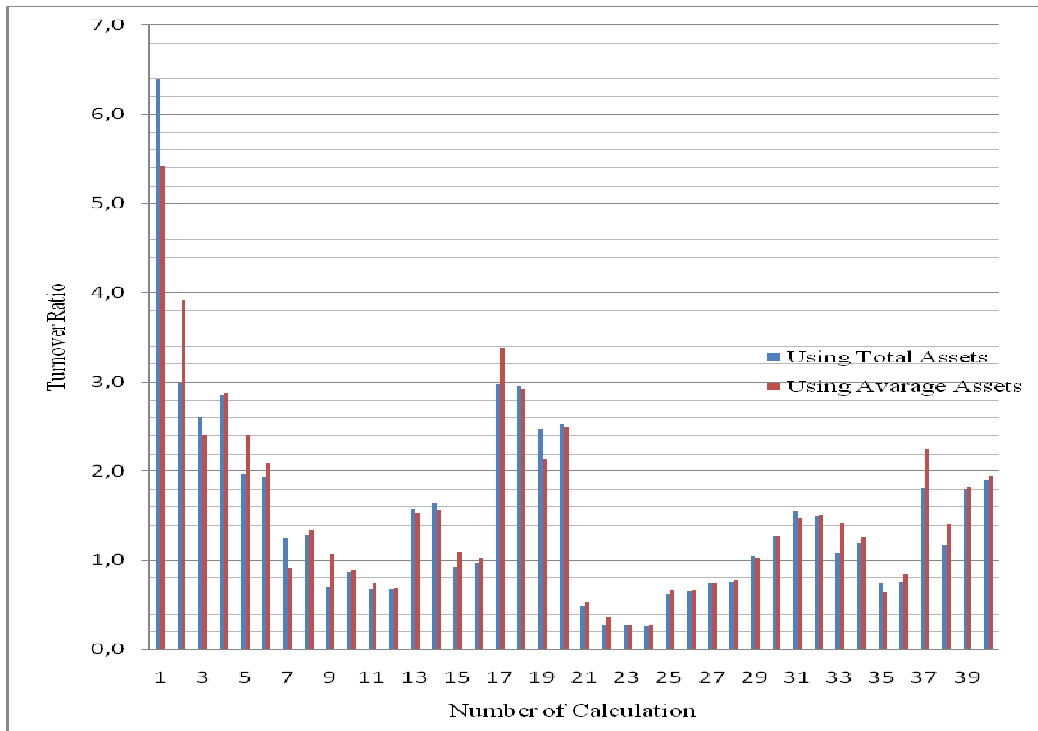


Figure 1 Comparisons of Assets Turnover Ratios

Source: Figure made by the authors of this paper

The results of calculation of assets turnover (Figure 1) shows, the greatest differences between ratios using total assets and average assets are observed at calculation No 1, where assets turnover ratio is 6,4 and average assets turnover - 5,4 and No 2, where assets turnover ratio- 3,0 and average assets turnover - 3,9.

Analysing the tendencies of those calculations of the last four years, the authors conclude, that using both methods the changes of assets turnover ratio shows the same tendencies. Other numbers of calculations showed the same tendencies of changes of ratios and differences of their turnover ratios are unimportant for estimating financial situation of a company, therefore the authors came to the conclusion, that there are no significant differences between used approaches computing companies assets turnover ratios.

The next object of calculations was turnover of accounts receivable.

For most companies selling on credit, accounts and notes receivable are an important part of working capital (Bernstein, 2000).

Results of calculation of receivables turnover (Figure 2) shows, the greatest differences between ratios using total receivables and average receivables is observed at calculation No 1, No 2 and No 6. At calculation Nr 1 total receivables turnover ratio are 97,6 and average receivables turnover - 124,9. Both calculated ratio are very high, transmitting ratio to receivables collection period – receivables collection days are 3,7 and 2,9, that means company does not practise selling on credit, so that receivables turnover ratio for assessing financial situation is not necessary. Estimating calculations No 6, where total receivables turnover ratio is 32,6 and average receivables turnover - 18,7, the authors conclude, that, the company has probably changed the policies of selling on credit, because the calculations results of the following year of this company showed fewer differences between total and average receivables ratio – 21,9 and 15,5 and last year it was 23.4 and 23.8.

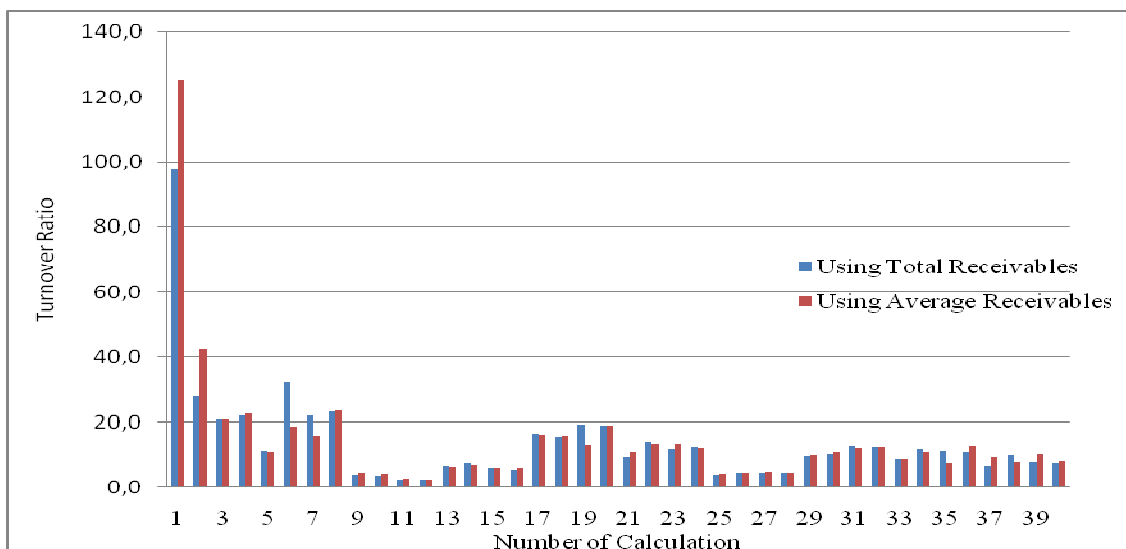


Figure 2 Comparisons of Receivables Turnover Ratios

Source: Figure made by the authors of this paper

To estimate a more objective result of calculation it is necessary to test annex of annual report of a company, where accounting policy of the company is described. That information for the authors of this paper was not available.

Analysing the tendencies of those calculations results of the last four years, the authors conclude, that they are the same - turnover ratios shows the same tendencies of changes of ratios. Other numbers of calculations showed the same tendencies of changes of ratios and differences of their turnover ratios are unimportant for estimating financial situation of a company, therefore the authors came to the conclusion, that there are no significant differences between used approaches computing companies receivables turnover ratios.

Inventory turnover ratio is important for every company which sells his production. The inventory turnover ratio indicates the liquidity of inventories. The higher the ratio, the more quickly inventory is being sold (Brag, 2007). Inventories are investments made for purpose of obtaining a return. This return is derived from the expected profits resulting from sales to customers. In most companies, a certain level of inventory must be kept (Bernstein, 2000).

Analysing inventory turnover ratios (Figure 3), the authors 4 calculations of the one company cut out of the study because its inventory turnover ratios were too high – more than 400 times. Testing the annex of the annual reports, the authors got information, that the company has a specific business features – manufacturing depends on customers orders and the production cycle is very short, so the company no significant value of inventory at the end of the year. The results of the calculation of inventory turnover (Figure 3) shows, the greatest differences between ratios are observed at calculation No7, No 13 No 31 and No 35. At calculation No 13 total inventory turnover ratio are 12,7 and average inventory turnover - 16,1, calculations Nr 35 - total inventory turnover ratio is 14,4 and average inventory turnover is 17,7. Those two examples show, that bigger turnover ratio are average inventory turnover. The opposite situation are observed at calculation No 7 and No 31. There are bigger inventory turnover using total inventory.

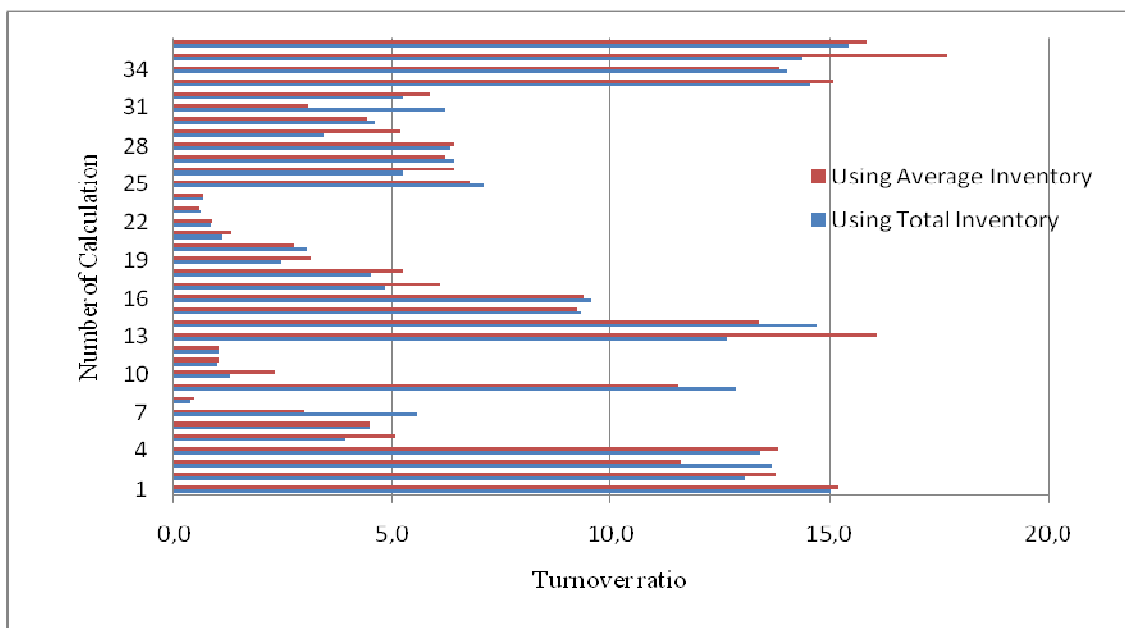


Figure 3 Comparisons of Inventory Turnover Ratios

Source: Figure made by the authors of this paper

Analysing the tendencies of those calculations results the authors conclude - inventory turnover ratios, using different approaches of calculations, shows the same tendencies of changes of ratios. Other numbers of calculations showed that there are no significant differences between results, therefore allows concludes, that there are no significant differences between used approaches computing inventory turnover ratios of companies.

## 5. CONCLUSIONS

Estimating the results of the current research, authors has got to the following main conclusions:

Studying scientific literature of the theoretical guidelines for the turnover calculations the authors of this paper found different approaches - some scientists prefer assets book value at the end of an annual year, while the others scientists recognize average value of assets.

Different terminology formulating types of assets, sales and costs for calculating ratios have used. Used terminology in different scientists works are connected with Britain and American language dialects and it historical development. So each analyst should be careful using the theoretical guidelines for calculation turnover ratios.

Analysing the total assets turnover ratio and their tendencies of changes which were calculated using average value and book value of assets, the authors concludes, that using both approaches the changes of assets turnover ratio shows the same tendencies. Therefore the authors came to the conclusion, that there are no significant differences between used approaches computing assets turnover ratios of companies.

The same result of research showed that there are no significant differences between the used approaches –book or average value computing accounts receivables turnover ratios of companies.

Investigated the results of inventory turnover, the author`s findings are the same as calculating total asset and receivables turnover ratios. Inventory turnover ratios, using different approaches of calculations, showed that no significant differences between used approaches computing inventory turnover ratios of companies.

Basing on the empirical research findings the author`s recommendations for analysts are that calculating turnover ratios for Latvian companies of manufacturing and trade branches, the both

approaches –book value or average value are useful for asset, receivables and inventory turnover calculations. The choice between the different approaches of calculations depends on the analyst. The analyst should make his choice before starting calculation for financial statement analysis and the chosen approach for calculating turnover ratios should be applied consistently year by year. Otherwise the calculated results will not be comparable.

At the end of current research the authors want to note, that the same study must continue with other important ratio – profitability of assets and equity.

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