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RATIO ANALYSIS AND PIOTROSKI SCORING SYSTEM IN THE AUTOMOBILE INDUSTRY IN CROATIA

Abstract

To gain insight into operational efficiency, sustainable profitability, the ability to fulfil commitments, use of funds borrowed or investment risk or operational self-sufficiency, it is necessary to conduct analyses of financial statements usually known as ratio analysis. The paper provides analyses of five Croatian general distributors of the automobile industry. Ratios used in the analyses are those used in the Piotroski f-scoring analyses, which are famous for assessing financial capacities of enterprises on the stock exchange market. Based on ratios used in Piotroski scoring systems the assessment of five enterprises, as well as the sector as a whole was carried out. The analysis covers the period 2007-2012. That is the period of the rise, falling and recovery of the automotive industry throughout the world as well as the rise, falling and recession of the whole economy including the automobile market. In general, the sector itself is financially unstable and consequently risk exposed. Results are used for preliminary analyses and prediction of the future financial strength of the auto industry in Croatia.

Keywords: ratio analysis, Piotroski f-score, automobile industry, Croatia

1. Introduction

Financial statements, including balance sheet, income statement, statement of changes in equity and statement of cash flows demonstrate:

- Balances of assets, liabilities and equity at the reporting date;
- Efficiency in use of assets and equities;
- Changes of equity as a consequence of a result from operations, capital transactions (return on capital investments) and direct changes of equity;
- Movement of cash flows by type of activity.

These documents show the state of finances of the business at the end of the financial period and undoubtedly contain all the essential items whose analysis can help to obtain data for future business decisions. However, to gain insight into operational efficiency, sustainability, profitability, the ability to fulfil commitments, use of funds borrowed, investment risk or operational self-sufficiency, it is necessary to conduct additional analyses (Bhattacharyya, 2011). Analyses that will provide answers to questions on the movements or state of some of these factors, and which will enable the comparability between the business systems within a certain economic sector or between different sectors, are called ratio analyses.

Ratio analyses show relationships among individual balance sheet items, balance sheet items and profit and loss items, balance sheet items and equity items and balance sheet items and items of cash flows (Ratio Analysis [13]). These ratios better show the dynamics of the company and are useful for assessing the activity of the enterprise in the current period, for comparison with activities in previous periods and comparability with other business systems belonging to the same industry or business sector. "Analysis of the relationships is a useful management tool to improve the understanding of the financial results and trends over time and provide key indicators of organizational performance" (Poznanski, 2013).

Businesses in certain sectors, cross-sector analysis, comparisons of business performance and business capabilities of individual companies in the sector for a longer period cannot be carried out by comparing the data only through financial statements or physical indicators of output or sales. Such information in the sectoral analysis as well as comparative analyses among companies do not provide usable results, due to which various analyses of the relationships between individual items of the financial statements are carried out.

The aim of this paper is to perform an analysis of the relationships using the financial statements and to assess the usefulness of this analysis in the automobile sector in Croatia. An analysis of selected companies through the scoring system of the used relations will also be performed and point out the benefits and limitations of the ratio analysis and of the scoring system in the selected sector.

Methodology

The financial state of companies in our sample will be assessed by using ratios in the Piotroski f- scoring system. Originally, the Piotroski analysis had ratios grouped into three groups of signals: profitability signals, operating efficiency signals and liquidity-leverage/source of signals. To every factor (ratio), a binary value (0 or 1) is assigned as follows (Piotroski, 2002):

Profitability ratios

- Net profit (Net Income): Bottom line. Score 1 if last year's net income is positive.
- Return On Assets: Score 1 if last year's ROA exceeds prior-year ROA.
- Gross Margin: A measure of improving competitive position. Score 1 if full-year's GM exceeds the prior-year's GM.

Operating efficiency ratios

- Asset Turnover: Measures productivity. Score 1 if the percentage increase in sales exceeds the percentage increase in total assets

Liquidity ratios

- Current Ratio: Measures increasing working capital. Score 1 if CR has increased from the prior year.
- Working capital (Operating Cash Flow): A better earnings gauge. Score 1 if last year's cash flow is positive.
- Quality of Earnings: Warns of accounting tricks. Score 1 if last year's operating cash flow exceeds net income.

Leverage ratios

- Long-Term Debt vs. Assets: Score 1 if the ratio of long-term debt to assets is down from the prior year's value. (If LTD is zero but assets are increasing, score 1 anyway).

Since the time when the Piotrosky system was first published, the methodology has changed slightly.

2. Ratio analysis

Different indicators in ratio analysis reveal different aspects of business and are used for a different purpose. Primarily they show the financial "health" of a company and indirectly managerial capabilities of a company and also for assessments of future trends. Shareholders and investors will use these indicators in their main long-term decisions (GuruFocus, 2013).

Success of ratio analysis depends on the accuracy and reliability of financial data, and the data must be (Poznanski et al, 2013):

- Calculated consistently from period to period .
- Used in comparison to internal benchmarks and goals.
- Used in comparison to other companies in your industry.
- Viewed both at a single point in time and as an indication of broad trends and issues over time.

Results of ratio analysis should be carefully interpreted in terms of the proper context (market characteristics, inflation, interest rates and specificities of a particular company and industrial branch or sector), purpose and priorities of the analysis, "considering there are many other important factors and indicators involved in assessing performance." (Ratio Analysis, [13])

In ratio analysis, the next group of indicators are usually analyzed, depending on analytical requirements:

- Profitability, business sustainability, operational efficiency, liquidity, rentability (Poznanski et al, 2013).
- Liquidity, profitability, solvency (Ratio Analysis [13],[14]).
- Balance sheet ratios, revenue statement ratios, mixed composite ratios (Bhattacharyya, 2011).
- Cash flow ratios, reinvestment ratios, liquidity ratios, profitability ratios and growth ratios (Delloite, 2013).
- Financial stability ratios, indebtedness ratios, liquidity ratios, business success ratios and solvency ratios (Croatian Financial Agency).

Analysis is usually conducted in three steps (Bhattacharyya, 2011):

1. Selection of relevant various accounting data from the financial statements;
2. Computation of related accounting ratios using those selected accounting data;
3. Analysis and interpretation of those accounting ratios in a very significant, logical and useful manner.

2.1. Problems of particular ratios

Some ratios need to have minimal values, some might be preferred in a particular industry sector, some might have strong and some might have minor importance. For example, current ratio, (which is the ratio between current assets and current liabilities) with a value less than 1 may indicate liquidity issues. A very high current ratio may mean that there is excess cash that should possibly be invested elsewhere in the business or that there is too much inventory. Most experts believe that a ratio between 1.2 and 2.0 is sufficient. (Investopedia.com)

Regarding the debt to equity ratio, "most lenders impose limits on the debt/equity ratio, commonly 2:1 for small business loans". Concerning the interest coverage, "ideally, the ratio should be over 1.5" (Poznanski et al., 2013). The ranges of other ratios could be broader, which hinders interpretation and comparability.

2.2. Integration of indicators – scoring systems for indicators

An analysis of the comparability of historical data of one company, comparability of data among companies in the same industrial field, or intersectoral comparability as well as comparability including additional criteria (number of employees, production in natural units, resource deployed etc.) could also be conducted. Such analysis has a partial nature, sometimes it is timely demanded, considering all the relevant data. The problems with these ratios and analyses based on them arise from different interdependencies among the data used in these ratios, which hinders interpretation of a given context. All those difficulties were reasons why ratio analysis has been expanded with different scoring systems whose main purpose was to get an ultimate numeric value that would represent the value or financial strength of the particular company. Scoring systems are based on the idea that some ratios need to have a weighted coefficient or binary value depending on the value that the current ratio has in relation to previous historical data.

Such ideas stem from the assessment of shares on the stock exchange, especially on volatile markets where 'valuable' firms need to be separated (mainly in long term planning of portfolios) from fast growing firms.(Hendrik, Mohr, 2011). One of the most used binary scoring systems that use different ratios is the Piotroski F-scoring system (or Piotroski analysis). The model is comprised of nine indicators similar to those used in complex ratio analysis. The value of an indicator in the current fiscal year is set on one (1) if the ratio has a value higher than the ratio in the previous year, or is set at zero (0) if the ratio value is lower than in the previous year. The sum of values of all indicators chosen in the analysis serves as a basis for ranking. Based on experience, valuable companies have a Piotroski score of 8 or 9 whilst other scores indicate financial instability or risk. The Piotroski scoring system was published in 2000 and after that slightly modified by many researchers. There are also scoring systems whose main purpose is prediction of potential troubles (bankruptcy) such as Altman Z-scoring and Messod Beneish, the M-Score, which is a mathematical model that uses eight financial ratios to identify whether a company has managed/manipulated its earnings. (http://www.stockopedia.com/content/the-beneish-m-score-identifying-earnings-management-and-short-candidates-56823/#sthash.Kt3ooa5b.dpuf, 2014), (Voison, 2014).

(http://www.frankvoisin.com/2012/05/30/what-is-the-beneish-m-score/)

In this paper, the scoring system is identical to the original Piotroski scoring system and will be used in assessment of the financial health of analysed automobile distributors in the Republic of Croatia. Since the companies analyzed in this paper are not quoted on the stock exchange, values of "Shares outstanding" will be put at 0.

3. Ratio analysis in the automobile sector in Croatia

Based on data available for a five-year period, i.e. for the years 2007-2012, this paper will perform an analysis of the relationships based on financial statements of automobile distributors in Croatia. Research will be carried out based on data of distributors of the following brands: Hyundai, Toyota, Peugeot, Renault and Citroen. This time was the period of entering into a recession, the recession and coming out of the recession of the automobile industry worldwide. This is also a period of the ending of the economic boom and the fall into the still ongoing recession of the Croatian economy. All these facts make ratio analysis useful for insight and assessment on how ratios have changed depending on market conditions and overall economic development/decline, as well as the ability of particular companies and sectors to adapt to such new terms and conditions.

4. Key characteristics of the automobile industry

Based on its part in the world's total GDP, the automobile industry is one of the most important industries in the overall global economy. The automobile industry with all its related industries is the largest manufacturing sector in the world and makes up around 15% of the world's gross domestic product (GDP) (Mashiah, 2010) and directly or indirectly employs about one tenth of employees in developed countries (Humphrey and Memedovic, 2003).

4.1. Automobile industry in Croatia

In Croatia, there is no production of automobiles and the demand for vehicles (of all types) is covered by imports. Supplying the market is usually carried out in a way that producers set up a business that retains the name of the manufacturer to which "Croatia" is added (e.g. Renault Croatia, Peugeot Croatia, etc.). Such a legal entity is founded with the aim to select and organize the sales and service network on Croatian territory. Another way to organize the distribution network is for a manufacturing company to enter into a contract with a distributor who then organizes authorized dealers. Main or general distributors establish a key relationship with suppliers (orders acquisition, procurement, temporary storage, distribution to authorized dealers according to their orders and capacities, organizing marketing activities and providing support from manufacturers).

Table 1. Shares of Croatian personal car market in overall world market and EU27 market

Year	2007	2008	2009	2010	2011	2012	2013
Share of Croatia in the world (%)	0.163	0.178	0.091	0.070	0.073	0.052	0.044
Share of Croatia in EU27 (%)	0.4214	0.469	0.270	0.234	0.242	0.194	0.175

Source: Author

4.2. Automobile market in Croatia

According to data from OICA (sales statistics, 2014) the share of sales on the Croatian market in relation to the overall global automobile market in percentages is shown in Table 1.

European automobile manufacturers such as Volkswagen, Opel, Renault, Peugeot and Citroen, take up the largest share on the Croatian market (ca 45%), while Japanese and Korean automobiles account for 10% of total sales of personal automobiles in the Republic of Croatia. The automobile market is strongly dependent on the purchasing power and the overall welfare of the population.

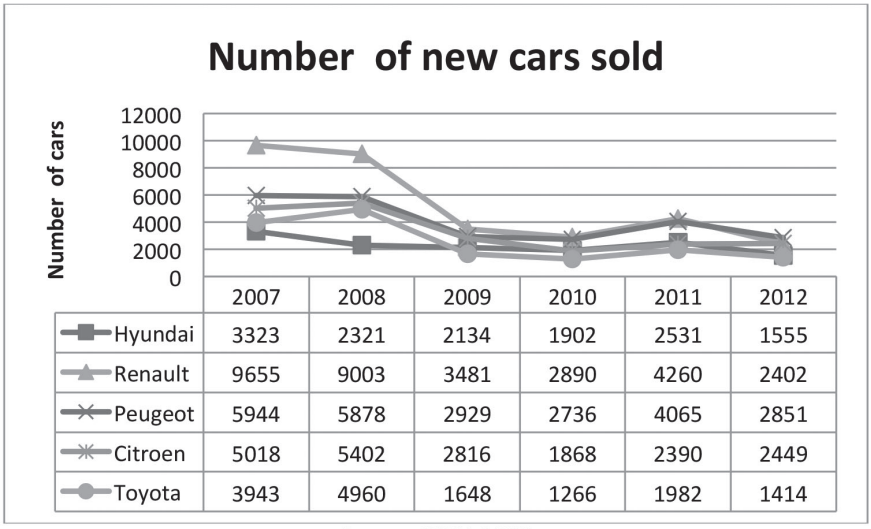
Sales of new cars of analyzed manufacturers are shown in Graph 1.

Graph 1. Number of personal cars of selected producers sold on the Croatian market

A steady decline in sales is noticeable from the table (Renault's drop in sales almost quadrupled, while other manufacturers' drop generally doubled when comparing the years 2007 and 2012). The year 2011 is an exception, when sales rose compared to the previous period, although this seems to be specific for the Croatian market. This could have been caused partly by the decrease of margins by some distributors, combined with the announced changes in value added tax regulations according to which the VAT rate was to increase from 23% to 25% as of 1 March 2012, and using any VAT pre-tax on purchases of personal vehicles would no longer be permitted for companies.

During 2013, according to the agency Promotion Plus, 27,802 new personal cars were sold in Croatia, which is 11.3 percent or 3,558 cars less than in 2013.

Therefore, the decline continued last year, since in the year before, 31,360 new passenger cars were sold, which is 10,201 or 24.5 percent less than in 2011.



	2007	2008	2009	2010	2011	2012
Hyundai	3323	2321	2134	1902	2531	1555
Renault	9655	9003	3481	2890	4260	2402
Peugeot	5944	5878	2929	2736	4065	2851
Citroen	5018	5402	2816	1868	2390	2449
Toyota	3943	4960	1648	1266	1982	1414

Source: OICA.NET

Sales of new cars are still very far from the sales in years before the crisis, when considerably more cars were sold in Croatia: 82,664 in 2007 and 88,265 in 2008. In 2009, sales of new cars fell to 44,891. (Monthly survey of new car market, 2014).

The most common reason for falling sales, which was pointed out by market analysts last year, is the general decline in the standard of living due to the crisis. It is well known that durable goods are sensitive to GDP: in times of recession and crisis, the purchase of durable goods is postponed.

The best-selling car brand last year (2013) on the Croatian market was Volkswagen with 4,691 cars sold and a market share of 16.9 %. Opel follows with a 9.6 % market share and 2,684 cars sold, and Peugeot is third with 7.3 % of the market share and 2,044 cars sold. These three brands are followed by Hyundai, Skoda, Renault, Citroen, Kia and Ford, according to their sales.

Among the various models, the best selling are Volkswagen Golf and Polo, Opel Astra and Corsa models and Hyundai i30, respectively. The sources for car sales in Croatia are Monthly survey of new car market http://www.autonet.hr/rubrika/hr-trziste and OICA.NET).

4.3. Key categories in ratio analysis of the Croatian automobile industry

Depending on purpose or goals, ratio analysis, as was mentioned in the introduction, could be carried out through different types, numbers and categories of ratios. In this paper, the following categories of ratios will be defined:

Profitability ratios

- Net profit (Net Income).
- Return On Assets.
- Gross Margin.

Operational efficiency ratios

- Asset Turnover.

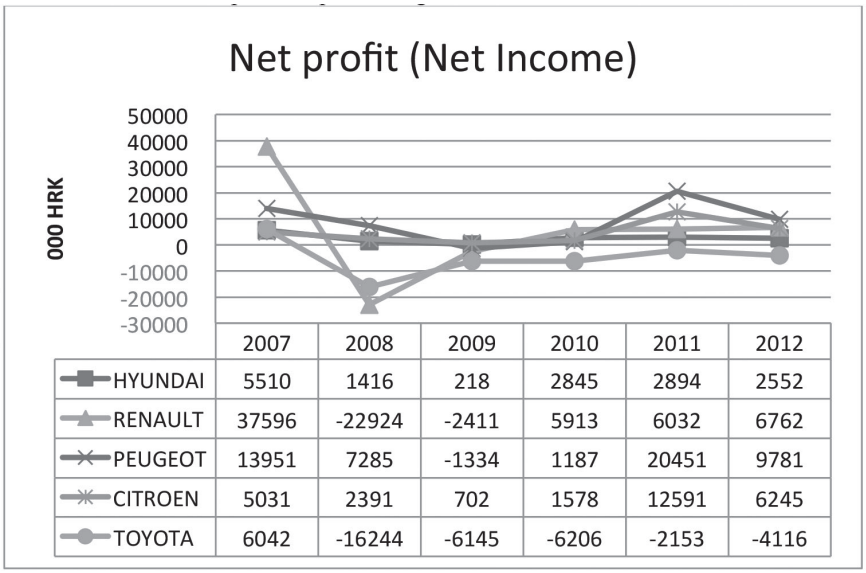
Liquidity ratios

- Current Ratio.
- Working Capital (Operating Cash Flow).
- Quality of Earnings.

Leverage ratios

- Long-Term Debt vs. Assets.

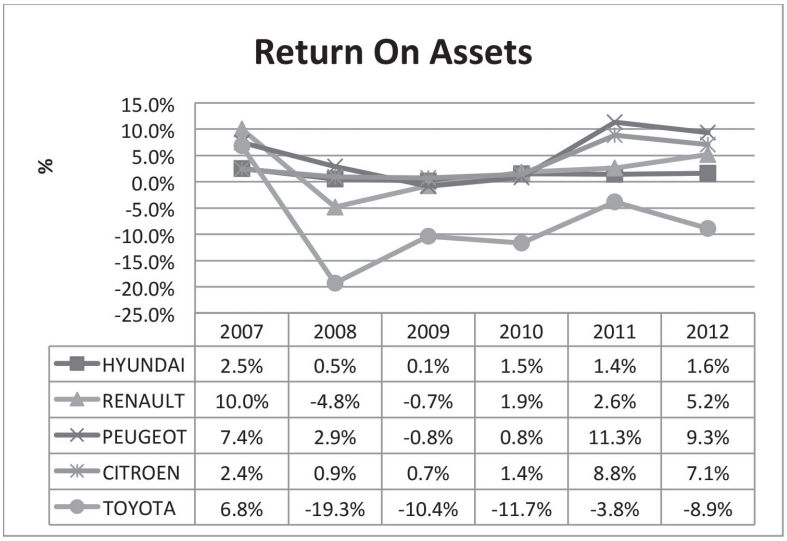
Graph 2. Net profit margin of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	5510	1416	218	2845	2894	2552
RENAULT	37596	-22924	-2411	5913	6032	6762
PEUGEOT	13951	7285	-1334	1187	20451	9781
CITROEN	5031	2391	702	1578	12591	6245
TOYOTA	6042	-16244	-6145	-6206	-2153	-4116

Source: Author

Graph 3. Changes in return on assets of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	2.5%	0.5%	0.1%	1.5%	1.4%	1.6%
RENAULT	10.0%	-4.8%	-0.7%	1.9%	2.6%	5.2%
PEUGEOT	7.4%	2.9%	-0.8%	0.8%	11.3%	9.3%
CITROEN	2.4%	0.9%	0.7%	1.4%	8.8%	7.1%
TOYOTA	6.8%	-19.3%	-10.4%	-11.7%	-3.8%	-8.9%

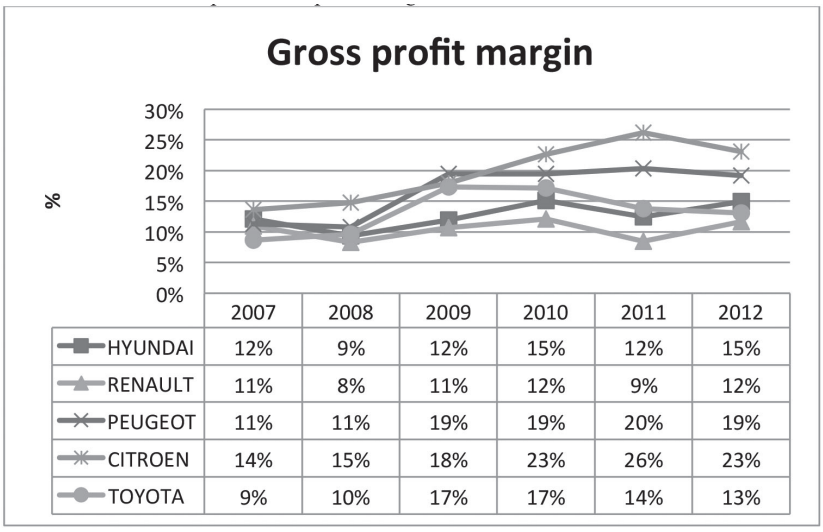
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4.3.1. Profitability ratios

Net profit

Net profit is the ultimate indicator ("bottom line") of enterprise profitability for shareholders and owners. It is the difference between revenues and expenses minus amortization and depreciation (which gives EBIDTA). EBITDA minus depreciation and amortization gives EBIT. When interest and other financial income are added, interest expense is subtracted, and foreign exchange/currency transactions are added or subtracted, the result is Profit before taxes (PBT). Subtracted taxes from PBT give the net profit.

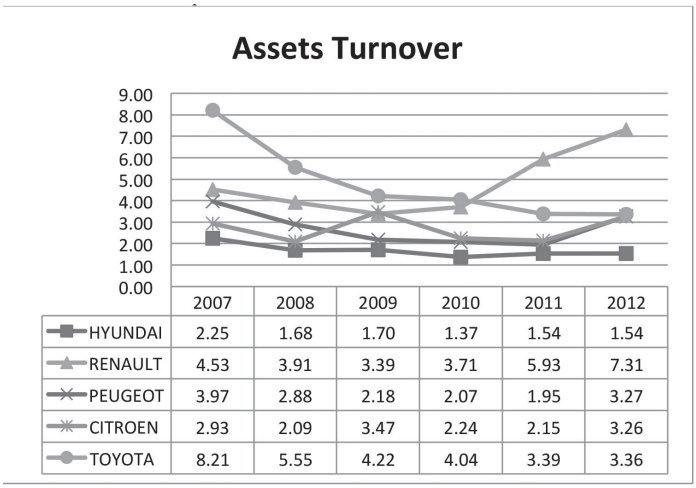
Graph 4. Gross profit margin of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	12%	9%	12%	15%	12%	15%
RENAULT	11%	8%	11%	12%	9%	12%
PEUGEOT	11%	11%	19%	19%	20%	19%
CITROEN	14%	15%	18%	23%	26%	23%
TOYOTA	9%	10%	17%	17%	14%	13%

Source: Author

Graph 5. Assets turnover of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	2.25	1.68	1.70	1.37	1.54	1.54
RENAULT	4.53	3.91	3.39	3.71	5.93	7.31
PEUGEOT	3.97	2.88	2.18	2.07	1.95	3.27
CITROEN	2.93	2.09	3.47	2.24	2.15	3.26
TOYOTA	8.21	5.55	4.22	4.04	3.39	3.36

Source: Author

During the automobile industry crisis (2008, 2009) there was evidence of a sharp decrease of net profit or even a loss. The general distributor for Toyota has shown a five consecutive year loss in their financial statements. This does not necessarily mean withdrawal of a producer from the local (national) market. Changes in net profit (net income) are shown in Graph 2.

Return on assets (ROA)

Return on assets is considered a key measure of profitability. It is a measure of managerial capacity of the firm for utilization of its assets: it shows how much net income is given by one monetary unit of total assets.

ROA = Net Income (Net profit)/Total assets

Changes in ROA are given in Graph 3.

Since net profit is a complex measure that depends on different factors, both on revenue and expense, as well as the structure of assets, the analysis of ROA for some operating purposes requires deep insight into other business categories. Our analysis shows that in relatively stable conditions ROA has a value in the range of 2 – 10 %.

Gross Profit Margin

Gross profit margin, which is the third measure of profitability, shows how much gross profit is derived from total sales.

Gross Profit Margin = Gross Profit / Total Sales

Gross profit margin shows the ability of a firm to cover all its indirect costs (wages, other operating costs, indirect taxes…). In our assessment, car distributors need a GPM of around 20% for covering most indirect costs. In most analyzed cases, GPM needs other revenues besides sales revenues (after sales activities and subsidies). Changes in gross profit margin are given in Graph 4.

4.3.2. Operational efficiency ratios

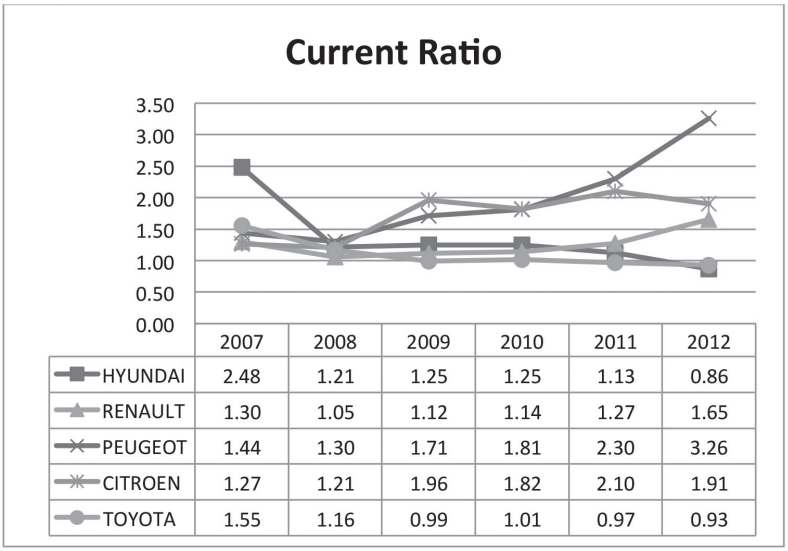
Assets turnover

This ratio indicates how much sales revenues the firm can generate on one monetary unit of its assets:

Asset Turnover = Revenue/Average Total Assets

This ratio is important for investors as well as for managers of all levels to be aware of assets and the importance of their employment. We did not find a pattern typical of this type for the automobile industry in Croatia.

Graph 6. Current ratio of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	2.48	1.21	1.25	1.25	1.13	0.86
RENAULT	1.30	1.05	1.12	1.14	1.27	1.65
PEUGEOT	1.44	1.30	1.71	1.81	2.30	3.26
CITROEN	1.27	1.21	1.96	1.82	2.10	1.91
TOYOTA	1.55	1.16	0.99	1.01	0.97	0.93

Source: Author

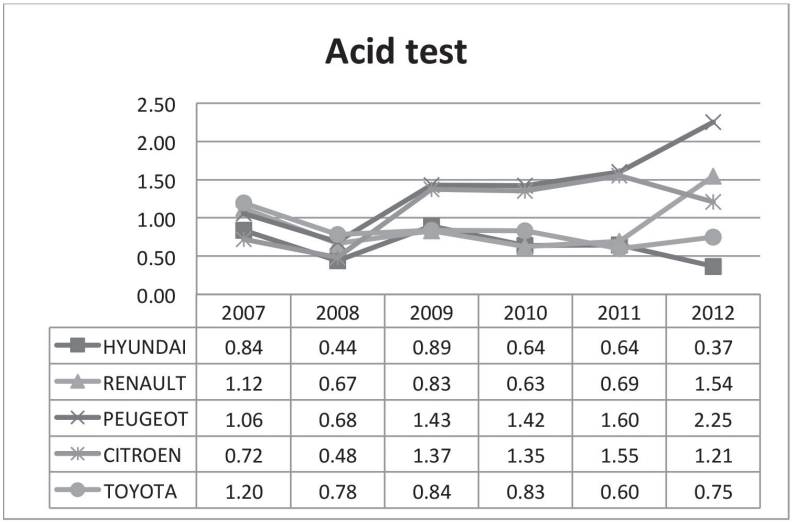
Additional analysis should be made considering the structure of assets, where some trends show that investments in non-current assets usually fall in a recession. Importance should be given to rational usage of non-current assets. Changes in assets turnover of analyzed firms is shown in Graph 5.

4.3.3. Liquidity ratios

Current ratio

The best-known ratio in this category is current ratio. Current ratio represents the quotient between current assets and current liabilities. Experientially, if this ratio is lower than one, the company has difficulties with liquidity.

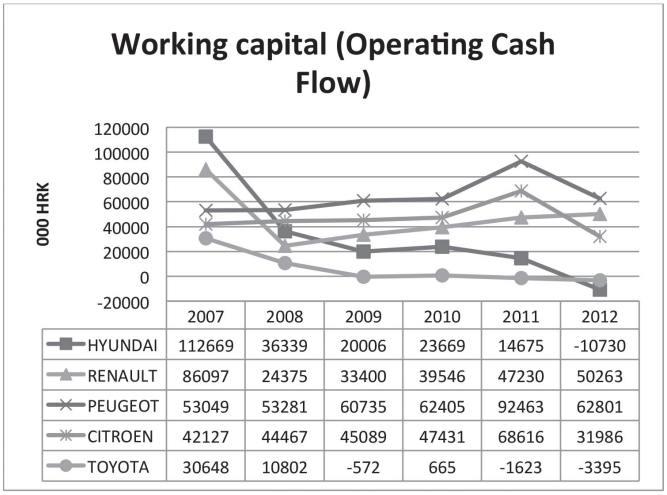
Graph 7. Acid test of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	0.84	0.44	0.89	0.64	0.64	0.37
RENAULT	1.12	0.67	0.83	0.63	0.69	1.54
PEUGEOT	1.06	0.68	1.43	1.42	1.60	2.25
CITROEN	0.72	0.48	1.37	1.35	1.55	1.21
TOYOTA	1.20	0.78	0.84	0.83	0.60	0.75

Source: Author

Graph 8. Working capital of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	112669	36339	20006	23669	14675	-10730
RENAULT	86097	24375	33400	39546	47230	50263
PEUGEOT	53049	53281	60735	62405	92463	62801
CITROEN	42127	44467	45089	47431	68616	31986
TOYOTA	30648	10802	-572	665	-1623	-3395

Source: Author

If this ratio is higher than 2, the company should try to find possibilities for investment. In addition, when high, this ratio could indicate excessive inventories that should be converted into cash as soon as possible. An experiential rule says that this ratio should have value in a range of 1.2 – 2.0 but also that there are specificities of a particular industry. Changes in current ratio with the analysed distributors and dealers are shown in Graph 6.

A company's ability for covering current liabilities in a very short time is tested through the acid test. In this ratio, only the most liquid assets (cash and cash equivalents, sales receivables) are taken into account. If the acid test is equal to, or greater than 1, the company has an acceptable level of liquidity. This analysis reveals the problem of days of payables and days of receivables. All companies, except Toyota have twice the amount of lower days in receivables than days of payables. The acid test analysis is shown in Graph 7.

Working capital analysis

Working capital (generalizations about how much working capital there should be. According to our analysis, working capital in the Croatian automobile distribution industry has a value in the range of 10 to 50 million HRK in the falling market and 30 to 100 million in the booming market.

Quality of Earnings

This ratio indicates a company's ability for continuity in running its business. This means that if a company has achieved sufficient working capital in the current fiscal year, which is higher than the profit from the previous year, it has the ability for long-term operation. Working capital should be sufficient for covering all expenses as well as losses from the previous year. Companies which do not have sufficient working capital (as in the case of Toyota's general distributor) are neither capable of sustainably operating a business nor covering the losses from previous years.

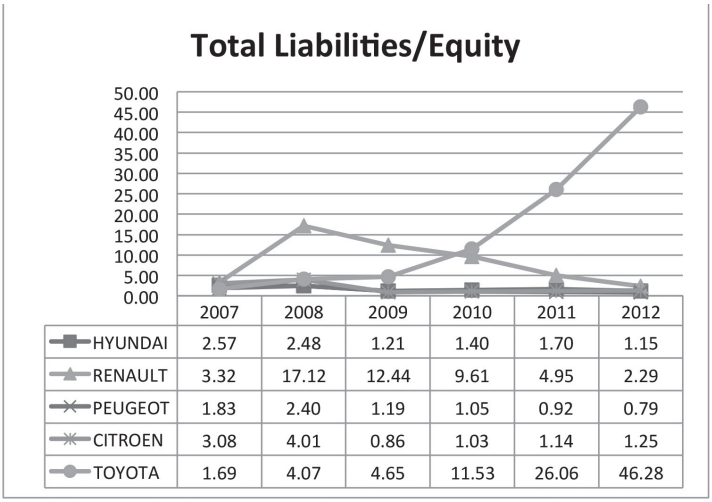
4.3.4. Leverage Ratios (Gearing ratio)

Long-Term Debt vs. Assets

Long-Term Debt vs. Assets ratio is an indicator that is especially interesting for borrowers and shows if long-term borrowings are spent on noncurrent assets. Based on experience, this ratio for a small company should not exceed 2. Graph 9 shows the ratio for the analyzed dealers.

Likewise, here are some other ratios that could be tested for the same reason, such as short term and long term /equity ratio and EBIT (EBITDA)/Interest Expenses.

Graph 9. Debt to equity of selected distributors



	2007	2008	2009	2010	2011	2012
HYUNDAI	2.57	2.48	1.21	1.40	1.70	1.15
RENAULT	3.32	17.12	12.44	9.61	4.95	2.29
PEUGEOT	1.83	2.40	1.19	1.05	0.92	0.79
CITROEN	3.08	4.01	0.86	1.03	1.14	1.25
TOYOTA	1.69	4.07	4.65	11.53	26.06	46.28

Source: Author

4.4. Comparison of Piotroski analysis and ratio analysis

Financial information of five distributors was analysed during a five-year period (2007-2012), using the most commonly used ratios and the Piotroski analysis.

The results obtained by these two analyses could lead to somewhat different conclusions.

Table 3 shows scores obtained by the Piotroski analysis.

The following ratios and items were analysed, since they are considered the most applicable to automobile distributors:

Revenue growth rate,

Days in receivables (y/e),

Days in inventories (y/e),

Days in payables (y/e),

Operating cycle days (y/e),

Current ratio,

ROA,

EBITDA margin,

EBIT margin,

Net profit margin,

NOPAT,

NOPAT growth rate.

Table 3. Piotroski scores for selected distributors

SCORING	2008	2009	2010	2011	2012
Hyundai	4	6	5	5	6
Renault	3	5	6	7	7
Peugeot	4	5	3	5	5
Citroen	4	6	5	5	5
Toyota	5	6	1	4	3

Source: Author

According to Piotroski scoring, in 2008 Toyota had the highest score. However, when observing results obtained by the ratio analysis, one would not come to such a conclusion, given the fact that profitability ratios such as ROA, EBITDA and EBIT margin, and its current ratio decreased. The reason is that the Piotroski model draws relations between the observed year and the previous year, and relies mostly on the increase of a certain value when assigning a positive result on a certain measure. Despite the negative ratios above, Toyota realised an increase in gross profit margin, unlike most other distributors, and had the shortest operating cycle days. Additionally, Toyota had a positive operating cash flow (in spite of net loss), which, combined with quality of earnings, in the end, gave Toyota the highest score among the five distributors in 2008.

Moving on to 2009, Hyundai and Citroen came into the lead in the Piotroski analysis. The reasons for this are net income, positive operating cash flow and quality of earnings, as well as an increase in current ratio, gross margin and asset turnover. Comparing these results to the results obtained by the ratio analysis, they are a bit more in line than in 2008. For example, Hyundai and Citroen are the only two distributors who realised a net profit in 2009, and had a positive ROA and net profit margin.

Continuing to 2010, Renault moved ahead of others in Piotroski scoring, which is an interesting change compared to 2009 when it was next to last. The reason is that almost all of the values analysed by Piotroski have increased compared to the year before in Renault's case, while this was not the case for other distributors. When observing the ratio analysis, Renault is the only one who realised positive revenue growth in 2010; it had the longest days in payables meaning it was able to rely on its suppliers for crediting, and it had the highest ROA. However, it had one of the lowest current ratios and EBITDA and EBIT margin.

In 2011, Renault took the lead in Piotroski scoring. In that year, the same conclusion could be drawn based on ratio analysis. Both Peugeot and Citroen realised revenue growth (although most others had done so too), both had the lowest days in receivables and among the highest days in payables, implying efficient working capital management. In addition, they were the only two that had a current ratio higher than 2.0 and had the highest ROA, EBITDA, EBIT and net profit margin.

Finally, in 2012 Renault and Hyundai came to the top. The reasons were that certain values observed by the Piotroski model had increased in comparison to the prior year. Again, however, one might not come to the same conclusion observing the results obtained by the ratio analysis, according to which Renault, for example, had the longest operating cycle, its current ratio was below 1, and its revenue the same as Hyundai's, i.e. it decreased compared to the prior year. Also, neither of the two distributors had the highest EBITDA, EBIT, or net profit margin.

In conclusion, this short analysis shows that taking into account only the Piotroski analysis or only the ratio analysis, a completely different conclusion might be drawn as to which company is "doing better" at a given moment. In order to gain useful results, the two analyses should be combined.

As stated above, financially sound companies have the Piotroski score of 8 or 9, whereas in the analysed cases there is only one distributor with a score of 7 for the last two years. In general, this indicates that the financial stability and strength of the surveyed companies in the observed period is insufficient, therefore the companies are not particularly attractive for investors. The financial stability was at its lowest at the time of the highest sales (2008), which can be explained by several factors. In 2008, the crisis of the world automobile industry was at its worst, but it did not quite spill over to the Croatian market. At that time, the key factor was to make a sale, while financial aspects of individual transactions were less of a concern. In 2009, in spite of a dramatic decrease in sales, the sector's financial performance and financial stability was at its highest. It was to deteriorate significantly in the following year, with the financial recovery in 2011, which remained stable in 2012 despite decreasing sales.

5. Conclusion

Ratio analysis is a useful management tool and a tool advisable for future investors in making decisions about mid- and long-term investments. Ratio analysis makes it possible to juxtapose the financial health of a business system at different times over a certain period, to compare the surveyed business system with its counterparts in the same industry, as well as to compare different industries. In this analysis, financial indicators from the basic finan-

cial statements can be put in different relations. The choice of a particular relation will depend on the standpoint and preferences of the stakeholders. When these relations are quantitative values, the issue to be considered is which desirable, necessary and sufficient values need to be calculated in the relationship analysis in order to safely say that the company under survey is more or less financially stable, i.e. successful. Furthermore, one needs to determine which additional factors (company size expressed in financial indicators, branch of industry, market circumstances such as crisis or recession of a sector, or of an economy as a whole, customer behaviour, their preferences and the like) should be considered in assessing how sound a business system is.

The ratios that can be examined are numerous, thus they can be categorized into larger groups such as profitability, liquidity, operational efficiency, solvency, indebtedness, etc. Which group of criteria will come to the forefront depends on the aims and purpose of the analysis. From the inception of the relationship analysis, there have been attempts to find scoring systems that would provide an overall assessment of a business system, or at least help to determine its ranking in comparison to others. Such a system was proposed by Piotroski, whereby business systems are ranked by a group of nine criteria, eight of which are characteristic relations from a company's financial statements. By comparing the relations from a current and preceding financial period, Piotroski could assess the prospects of a business system. These assessments have been intensively used for making long-term investment decisions on stock markets. Highly ranked systems receive the coefficient 9, slightly lower ranked systems have the Piotroski score of 8, whereas all the others were associated with a smaller or larger risk regarding their future performance. Such indicators can be found as regular reports on web sites of consultancies, brokerages and financial advisors (e.g. The Graham Investor).

Although several ratios were mentioned, the final choice was the ratio for the Piotroski analysis. Based on these indicators, an analysis was performed on five major car distributors on the Croatian market. The survey covered the period 2007 to 2012. This period was the time of deep crisis for the automobile industry around the world, followed by recession and recovery. With a delay of 18 months to two years, the Croatian economy sank into the deepest recession ever, which is continuing, and during which car sales have been constantly falling.

Considering car distribution in a relatively small market, which has been struggling with a recession for the past five years, this industry is financially unstable and risky in terms of investment. The analysis has shown that only one general distributor managed to attain the score of 7 on the scale. The surveyed companies attained their lowest scores in 2008, which is probably due to excess supply, consumer subsidies, lower requirements for financial discipline, and intensive supply-side pressures. Because of these circumstances, and despite the dramatic fall in demand for new vehicles, financial results of the surveyed group were at their best in 2009. This was followed by a fall of almost 30%, after which financial consolidation and discipline were in order.

Although the Piotroski analysis and scoring system have proved to be useful primarily in assessing the financial stability of large systems quoted on stock exchanges, they are also a good tool for preliminary financial assessments of individual companies in any chosen sector. When considering smaller business systems that are not quoted on stock exchanges, it is advisable to use other indicators for adjustment, particularly those that can determine more precisely the real nature of relations between financial indicators. In addition, it is advisable to conduct an Altman Z-score test to get insight into the risk of bankruptcy and the Beneish M-test to identify whether a company has managed / manipulated its earnings.

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Analiza omjera i piotroski bodovni sustav u automobilskoj industriji u Hrvatskoj

Sažetak

Za stjecanje uvida u operativnu učinkovitost, održivost profitabilnosti, sposobnost za ispunjavanje preuzetih obveza, iskorištavanje posuđenoga novca, odnosno rizičnost investiranja ili pak operativnu samodostatnost, nužno je provesti analize financijskih izvještaja, uobičajeno poznate kao analize omjera. U radu će se provesti analiza omjera 5 zastupnika automobilske industrije u Republici Hrvatskoj. Omjeri korišteni u analizama su oni koji se koriste u Piotroski ''f-scoring" analizama poznatima u procjenama financijske sposobnosti poduzeća prisutnih na burzama. Na temelju pokazatelja koji se koriste u Piotroski bodovnom sustavu provedena je procjena pet poduzeća, kao i procjena sektora u cjelini. Analiza pokriva razdoblje od 2007. do 2012. godine. To je razdoblje rasta, pada i oporavka automobilske industrije u cijelome svijetu, kao i rasta, pada i recesije cjelokupnoga gospodarstva, uključujući i automobilsko tržište. Općenito, sam sektor financijski je nestabilan i time izložen riziku. Rezultati se koriste za preliminarne analize i predviđanja buduće financijske snage automobilske industrije u Hrvatskoj.

Ključne riječi: analiza omjera, Piotroski f-score, automobilska industrija, Hrvatska