A Comparative Study of Financial Ratios of Automotive Industry: A Cross Country Analysis

Fahriye Behcet

Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master
of
Business Administration

Eastern Mediterranean University
January 2019
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

Assoc. Prof. Dr. Ali Hakan Ulusoy
Acting Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Business Administration.

Assoc. Prof. Dr. Melek Şule Aker
Chair, Department of Business Administration

We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Master of Business Administration.

Asst. Prof. Dr. Hasan Özyapıcı
Co-Supervisor

Assoc. Prof. Dr. İlhan Dalcı
Supervisor

Examining Committee

1. Prof. Dr. Sami Fethi

2. Assoc. Prof. Dr. İlhan Dalcı

3. Asst. Prof. Dr. Galip Erzat Erdil

ABSTRACT

Consequential percentage in economy of many countries are supported by value adding production systems of automobile companies. Automotive sector creates high rivalry among the countries. Strength of the sector in each country is determined by the total average achievement of all companies.

Financial ratios are used to measure liquidity, efficiency, solvency and profitability of companies. In this study, return on equity ratio, return on asset ratio, profit margin ratio, gross profit ratio, EBIT ratio, EBITDA ratio, asset turnover ratio, stock turnover ratio, current ratio, liquidity ratio, solvency ratio, and gearing ratio have been used for analysis. Comparison among France, Germany, Italy, Japan, Korea, Spain and Turkey for period 2008 to 2016 has been covered by descriptive statistics, ANOVA test and representation of nine year trend.

Results represents that; Italian automotive industry has extreme financial fluctuations. In contrast, France, Germany and Spain has common and more stable general trend. Far East countries; Japan and Korea, have independent ratio averages. Turkey has completely independent, increasing trend compare to industry averages of other countries. In addition, Turkey has highest profitability average according to descriptive statistic results.

Keywords: Financial analysis, Automotive industry, Financial ratios

ÖZ

Otomotiv endüstrisi birçok ülke ekonomisi üzerinde önemli rol oynamaktadır. Otomotiv firmalarının ülke ekonomisine kattığı önemli değer, ülkeler arası ekonomik rekabeti de arttırmaktadır.

Finansal rasyolar, şirketlerin likidite, karlılık, finansal yapı ve faaliyet oranlarını ölçmek amacıyla kullanılmaktadır. Bu çalışmada seçilen on iki farklı finansal rasyo, Fransa, Almanya, Italya, Japonya, Kore, İspanya ve Türkiyede'ki otomotiv endüstrisinin finansal yapısını karşılaştırmak amacıyla kullanılmıştır.Her bir finansal rasyo için, 2008 – 2016 yılları arasında, ülke bazında elde edilen toplam statistikler; temel statistik oranları, ANOVA testi ve dokuz yıllık sürecin trend analizi kullanılarak kıyaslanmıştır.

Yapılan analizler doğrultusunda; Italyan otomotiv endüstrisinde büyük oranda finansal dalgalanmalar olduğu görülmüştür. Bunun yanında, Fransa, Almanya ve İspanyadaki otomotiv endüstrilerinin genellikle ortak ve İtalya'ya oranla daha dengeli bir finansal yapısı olduğu saptanmıştır. Avrupa ülkelerinin gösterdiği uyumlu hareketlerin aksine, Uzakdoğu ülkelerindeki finansal rasyo ortalamalarında hiç bir ortak eğilime rastlanmamıştır. Türkiye, diğer ülkelerden bağımsız olarak artan ivmeye sahip olup, genel ortalamalarda daha yüksek karlılık göstermektedir.

Anahtar Kelimeler: Finansal analiz, Otomotiv endüstrisi, Finansal rasyolar

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ANOVA	Analysis of Variances
EBIT	Earnings Before Interest and Tax
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
MANOVA	Multiple Analysis of Variances
ROA	Return on Assets
ROE	Return on Equity

Chapter 1

INTRODUCTION

Financial accounting is a system of recording, collecting and analysing the transactions in order to have meaningful summary of accounting activities for better decisions according to (Williams, et al., 2012). For better decisions, profitability, liquidity, productivity and efficiency of company has to be understood. These values are measured and calculated by using financial ratios. In fact, calculations of the financial ratios are not sufficient and meaningful for managers. Results of ratios should be compared by other competitors in industry and with past performance records of company according to Muğan and Akman (2010).

This study focuses on the comparison of financial ratios in automotive industry for seven different countries. Total averages of each country are compared with each other to indicate the differences and trend of ratios for nine year period.

Automotive industry increases the competitive advantage of economies from many points of view. Firstly, industry supports countries by offering huge number of employment opportunities; secondly, automotive firms increase the welfare of economy even if it is a small company. The reason behind that, is the value edit production system of firms. This economic support and production power increases the economic strength of a country according to Heneric, Licht and Sofka (2005).

Automotive industry leads the major percentage of the world trade activities. Information about the value of automotive industry in 2016 and the share of automotive industry in the world trade for years 2000, 2005, 2010 and 2016 are represented in Table1.

Table 1: Top ten exporters and importers of automotive products, 2016

Source: World Trade Organisation, Statistical tables, 2016

	*VALUE	**SHARE IN WORLD EXPORTS			
EXPORTERS	**2016**	**2000**	**2005**	**2010**	**2016**
European Union	682	49.8	53.6	50.1	49.8
Japan	148	15.3	13.3	13.7	10.8
United States of America	128	11.7	9.4	9.1	9.3
Mexico	96	5.3	3.8	5.1	7
Canada	66	10.5	7.3	4.6	4.8
China	49	0.3	1.1	2.6	3.6
Turkey	20	0.3	1	1.3	1.4
Indıa	13	0.1	0.3	0.7	0.9
Korea	65	2.6	4.1	5	4.8
Thailand	28	28	0.9	1.7	2
IMPORTERS					
European Union	537	42.4	45	38.6	38
Japan	22	1.7	1.4	1.3	1.5
United States of America	295	29.3	21.9	17.1	20.9
Mexico	25	3.4	2.7	2.7	3.1
Canada	70	8	6.2	5.4	5
China	75	0.7	1.4	4.8	5.3
Turkey	20	1	1.3	1.4	1.4
Australia	25	1.5	1.6	2.1	1.8
United Arab Emirates	18	0.4	0.7	1	1.3
Saudi Arabia	17	0.7	1.1	1.4	1.2

* value in billion dollars and **percentages

From the percentages in Table1, it can be concluded that, a huge and important portion of the world trade is handled by automotive industry. This study compares

financial ratios of automotive industry companies in France, Germany, Italy, Japan, Korea, Spain and Turkey. It is expected that, the results of this study will be efficient and effective for managers, creditors, investors and financial information users.

1.1 Research Gap

Comparisons of financial ratios have been covered among the companies in the same country in different industries, including the automotive sector as well as, the companies applying different accounting procedures. However, there is a lack of research for comparison of financial ratios in automotive industry among the different countries.

Existing studies for automotive industry focuses on the comparison among companies which are rival in same country. In contrast, comparison for financial ratios of automotive industries among different companies has not been studied.

1.2 Research Questions

In this study; following questions have been used to analyse the comparison results of financial ratios for companies in automotive industry;

I. What are the differences or similarities in trend of average financial ratios in each country?

II. Are there any differences or similarities among the ratios of automotive companies in different countries?

1.3 Research Objective

This study aims to specify the differences and similarities of financial ratios for companies in automotive industry by using return on equity ratio **(**ROA) and return

on equity ratio (ROE) using net income, profit margin ratio, gross margin ratio, earnings before interests and taxes (EBIT), earnings before interests, taxes, depreciation and amortization (EBITDA), net asset turnover, stock turnover, liquidity ratio, current ratio, solvency ratio and gearing ratio.

Goal of the thesis is to provide useful information for managers, investors, creditors, governments and other financial information users.

1.4 Significance of the study

Comparison of financial ratios of automotive companies has been previously made in single country market. However, this study is the first one to compare financial ratios of automotive industry companies among countries. In addition to country comparison, trend analysis of financial ratios are also compared and contrasted for nine-year period. These factors are expected to provide important awareness for managers, financial information users, creditors and investors.

1.5 Scope of the study

This thesis compares total average financial ratios of automotive companies in France, Germany, Italy, Japan, Korea, Spain and Turkey. Data set includes values of 278 company between the years 2008 and 2016. In study, secondary data has been used from Orbis.net and analysed by using special statistic program SPSS.

1.6 Limitations of the Study

The main limitation of this study is the number of countries included in the research. In the thesis, only seven countries are taken into account. That is to say, coverage area of study is limited with represented countries above and does not include

information in a worldwide range. The second important limitation of the study is the range of years. The study covers only nine year period between the 2008 and 2016.

1.7 Structure of the Study

This study consists of six chapters. The first chapter is about general information about automotive industry, importance and usage of financial ratios and defines the fundamentals of thesis for a smooth introduction. In the second chapter, theoretical background has been explained under four main categories as profitability, liquidity, solvency and efficiency ratios.

The third chapter represents previously made studies on the financial ratios of companies in different industries in the same country, as well as different industries in different countries. It also bears information on the automotive sector or companies using different accounting standards under the title of literature review. Chapter four focuses on the methodology of the study and the title is explained under three different sections. These subtitles can be listed as data collection, measures and data analysis.

Chapter five is organised to interpret the results of the study. Explanations of results are given in three parts. The first part of the chapter has the descriptive statistics about financial ratios used in the study. In the second part, ANOVA test results for each country have been explained under the title of financial ratios. The third and the last part of chapter five, is trend analysis for each financial ratio. Results are explained separately for each country.

Chapter six is about the implications and conclusion. Results are organised for directors, creditors, investors and financial information users. Implications have details about automotive industry of each country for categories of financial risk, efficiency, profitability and solvency rate.

Chapter 2

LITERATURE REVIEW

This section covers information about previously made researches which are comparing the financial ratios of companies. Comparison has been made among different industries, among companies in the same industry, among many different industry companies within the same country, among companies which are using different accounting standards, among the companies in automotive industry in the same country or among the companies in different countries. Studies about comparison of financial ratios have been categorised and explained below;

2.1 Comparison of Companies Operating in Different Industries

Comparison of hotel and restaurant industry is covered by Kim (2006). The study analyses differences in liquidity, solvency, activity and profitability ratios between hotel and restaurant sectors. In the research, secondary data from COMPUSTAT database is used for 2000 – 2004 time period. For data analysis SPSS statistic program is used to cover EBIT, EBITDA rates and multiple analysis of variances (MANOVA) test. In conclusion, it has been found that there is no difference in profitability ratios of the two sectors whereas in hotel segments there is higher liquidity and activity ratios compared to restaurants. In contrast, Restaurants have more capability for long term financial obligations.

Air transportation industry was another focus, so Ali and Charbaji (1994) has been analysed the financial ratios of airlines companies. The study aims to compare financial ratios of air transport industry with other industries. Financial data for year

1986 is used and primary data is gathered by connecting to International Civil Aviation Organization. Factor analysis, logarithmic transformations and other forty-two financial ratios are used to improve normality and homoscedasticity to reduce outliers. In conclusion, it is found that in contrast to manufacturing industry, air transport industry has long term financial structure for net worth position, profitability index and fixed asset management.

2.2 Comparison of Companies Operating in the Same Industry

In order to present a comparison of companies in the same industry from the financial ratio perspective; a study of industry financial ratios by Drury, (1981) focuses on predicting failure or bankruptcy of merged firms by using cash flow and total debt ratio. Primary approach is to compare average financial ratios with industry averages. In this study; key financial ratios such as, return on investment ratio, percentage return on investment, acid test ratio for short term liquidity, working capital ratio, and interest coverage ratio have been analysed under yearly time period in low and high level of industry categories. It is found that firms efficient in profitability have most acceptable liquidity ratios and larger volatility for shareholders net earnings.

Another detailed study is made by Tan, Koh and low in 1997. The name of the study was Stability of Financial Ratios: a study of Listed Companies in Singapore. The study aims to analyse stability of financial ratios across the industry and plans to answer if ratios are industry specific, time specific and to identify benchmarks for evaluating performance in a time period. For sample selection, companies existing in the list of Stock Exchange of Singapore between the dates of 1980 – 1991 were selected. Descriptive statistics, mean scores, Factor analysis, ANOVA and standard

deviations are used as methodology. It has been found that industry averages are not appropriate benchmarks for performance setup and evaluation through time.

Pakistan was another country that ratio analysis has been covered for. Financial ratios of Islamic and Conventional banks are compared between the periods of 2007 and 2014. T- Test and regression analysis have been used for comparison and it has been found that Islamic banks in Pakistan are more profitable, efficient, has higher liquidity and lower risk compared to conventional banks by Khan (2017).

Comparison of financial ratios have also been covered on chemical industry by the article; “Impact of Financial ratios on the financial performance of a chemical company: the case of LyondellBasell Industries” by Borhan, Mohamed and Azmi, in 2014. The purpose of the study is to examine effect of financial ratios over the financial performance of a chemical company. Current ratio, quick ratio, debt equity ratio debt ratio, and liquidity ratios are considered during the research. Ratios are measured between the periods of 2004 – 2011 as quarterly secondary data. According to results, it is determined that there is a positive relationship between current ratio, quick ratio, debt ratio, net profit margin and the financial performance of the company. On the other hand, there is a negative relationship between debt equity ratio and operating profit margin.

2.3 Comparison of Companies Operating in Different Industry, within the Same Country

Interesting research has been made to understand the relationship of stock returns and financial ratios among the Egyptian companies by Omran and Ragab (2004). In this study, relationship of financial ratios and stock returns of 46 Egyptian firms are

analysed for 1996 – 2000 time period. Profitability, efficiency, liquidity, leverage and coverage ratios are analysed to identify relationship. It has been found that there is non-linear relationship of financial ratios and stock returns

2.4 Comparison of Companies with Different Accounting Standards Procedure

Financial ratios also can be compared between the companies with different accounting standards. Two companies using International Financial Reporting Standards (IFRS) and Generally Accepted Accounting Principles in the US (US GAAP) accounting systems are analysed by Bao and Romeo (2010). Purpose of this research is to identify differences over reporting inventory property plant- equipment intangible assets- development ratios by financial reporting standards and US generally accepted accounting principle. For research T-test and ANOVA test are used for comparison of ratios among companies reporting by IFRS and US GAAP standards. In result it has been found that IFRS have higher current ratio and lower asset turnover and debt to asset ratio.

Beside of comparing the accounting standards, financial ratios are also compared to understand the success or performance level of companies. Delen, Kuzey and Uyar (2013) used several financial measures and tree algorithms approach to analyse performances of different companies. As a result Earnings before Tax to Equity Ratio and Net Profit Margin ratio has been appeared as best ratios to compare company performance.

2.5 Comparison of Companies in Automotive Industry

Automotive industry is another focus for ratio analysis between the companies is the same country. Mesaric (2014) studied over the companies in Croatia which are competitor in the automotive industry. In the research Piotroski scoring system has been used for analysis of data ranging between years of 2007 to 2012. Economic factors, their effects and financial risks are studied for automotive companies and results are used to increase the strength of firms in Croatia.

Another study has been covered about automotive industry in Turkey by Bulgurcu (2013). In analysis; financial data for automotive industry companies have been analysed by Technique for Order Preference by Similarity to Ideal Solution Method for period of 2009 – 2012. As a result, better efficiency for small firms has been determined compare to financial ratios of big companies.

Hungarian automotive industry is used for another research for comparison of financial ratios by Szucs (2015). Factor analysis, cluster analysis and descriptive statistics have been used in study to analyse the changes over financial ratios for 10 years of period in Hungary. In conclusion it is determined that the automotive industry is the driven force of economy.

2.6 Comparison of Companies in Different Countries

Financial ratios of companies in China and Japan have been compared (8Liu, et al., 2013). Ratios of 75 Chinese and 75 Japanese companies are compared and found that companies in two country have significant differences for liquidity and solvency ratios.

In order to summarise, several studies have been made between industries or among the companies that are rival in same industry or between different industries in the

same country. On the other hand, there is not any existing study that focuses on comparing the financial ratios of companies in automotive industry among countries. In addition, study will indicate maximum and minimum averages about each financial ratio for comparison and indicates nine year trend for financial ratios.

Chapter 3

THEORITICAL BACKGROUND

Under this section; definitions and explanations of the main financial ratios are presented. In general, ratios are categorised under four main titles. These titles can be listed as; profitability ratios, liquidity ratios, solvency ratios and efficiency ratios (Samuels, Brayshaw and Craner, 1995). Explanations have been respectively given below:

3.1 Profitability Ratios

Profitability ratios are used to measure return of earnings or profit gathered from revenue. Profitability ratios can be listed as net profit margin, operating income margin, return on assets, return on equity, return on investment and gross profit margin. (Muğan and Akman, 2010). These ratios are explained below: (e.g.: Powers and Needles (2012), Williams, et al., (2011), Williams, et al., (2012), Walsh (1993), Muğan and Akman (2010), Samuels, Brayshaw, and Craner, (1995),)

Net Profit Margin

Profit margin ratio is used to indicate cost management of companies. Reason behind this indication is inversely proportional relationship of profit margin value and cost value. That is to say if the cost of company is high, the profit margin of the company will be low.

Profit margin ratio is calculated by dividing Net Income (Net Sales) in to Revenue. In order to understand the meaning of the result, ratios should be compared with the

results of other companies that are rival in the same industry according to Powers and Needles (2012).

Net Income

Calculated by subtracting expenses of a company from the revenue. In other words it is the final amount of earnings after paying all of the costs like salaries, taxes, rents. (Powers and Needles, 2012).

Operating Income Margin

Operating income margin is calculated to understand the rate of earnings after eliminating the cost of goods sold and operating expenses. From that point of view, it is calculated by dividing the operating earnings to revenue. (Brigham and Houston, 2017)

Return on Assets (ROA)

ROA is calculated to understand how much of the income is earned by the lead of companies' assets. ROA is calculated by dividing Net Income to Average Total Assets. (Walsh, 1993)

Return on Equity (ROE)

ROE is division of net income to average of total equity. Simply, it is calculated to understand how much of the income is earned by equity. Measuring the return on equity ratio, represents if the rate of return earned for stockholders is satisfactory or not (Powers and Needles, 2012).

Return on Investment

ROI ratio is calculated to understand how much income is generated from the invested capital. ROI is calculated by dividing net income into the addition of long-term liabilities and equity. (Walsh, 1993)

Gross Profit Margin

Gross profit is calculated when direct costs are subtracted from sales revenue. Direct cost can be direct labor cost, direct material cost. After calculating the gross profit, gross profit margin is calculated by dividing the gross profit to net sales. (Mugan and Akman, 2010)

3.2 Liquidity Ratios

Liquidity ratios are representing the rate of convertibility of assets into cash in order to pay the liabilities (Arnold, Hope and Southworth, 1944). Most frequently used liquidity ratios are, quick ratio (also known as acid-test ratio), current ratio or working capital ratio, and cash ratio. (Mugan and Akman, 2010). These ratios are explained below.

Quick Ratio or Acid Test Ratio

Quick ratio measures the convertibility of quick assets into cash in order to pay existing liabilities. Quick assets can be explained as the assets that can be exchanged with cash in 90 days. Acid test ratio is calculated by dividing the addition of cash, cash equivalents, short term investments and current receivables into current liabilities. (Mugan and Akman, 2010).

Current Ratio or Working Capital Ratio

Current ratio is a measure of liquidity calculated by dividing current assets of company into current liabilities. The company is expected to have higher current ratio than competitors, because greater value represents more assets. (Mugan and Akman, 2010).

Cash Ratio

Cash ratio is calculated to understand the rate of liquidity of marketable securities and cash equivalents in order to pay current liabilities. (Mugan and Akman, 2010).Cash ratio is calculated by dividing the addition of marketable securities and cash equivalents in to current liabilities. (Taylor and Underdown, 1992)

3.3 Solvency Ratios

Solvency ratios are used to measure the ability of company to pay its liabilities. Mainly calculated solvency ratios can be listed as debt to asset ratio, debt to equity ratio and interest coverage ratio according to Kajananthan (2014). Explanations of those ratios are represented below;

Debt to Asset Ratio

Debt to asset ratio is measured to understand the amount of debt that the company has, in order to purchase assets. Lower ratios are expected after calculations because lower ratio represents lower financial risk. It is calculated by dividing total debt to total assets. (Powers and Needles, 2013)

Debt to Equity Ratio

Debt-Equity ratio, which represents the debt of company to its stockholders, is calculated by dividing total liabilities of company to total equity. (Mugan and Akman, 2010)

According to Powers and Needles (2012) payments for creditors and interest on debt should be previously paid even if the company has a low performance. That is the reason why higher debt equity ratio represents higher financial risk.

Gearing ratio

Gearing ratio is the rate of borrowed funds to company equity. Ratio represents the financial risk about entered funds. Similar to debt - equity ratio, higher values represent the higher financial risk. Gearing ratio is calculated by dividing EBIT to interest payables (John, Arnold, and Southworth, 1944)

Interest Coverage Ratio

Interest coverage ratio is calculated in order to explain the rate of interest expense covered by the company's operating income. Ratio is calculated by dividing the EBIT to interest expense. (Mugan and Akman, 2010)

EBIT- Earnings before Interests and Tax

EBIT is the total earning or the profit of the company before subtracting the taxes and interest payments. EBIT is calculated by subtracting operating expenses from operating revenues. (Williams, et al., 2012)

EBITDA – Earnings before Interests, Taxes, Depreciation and Amortization

EBITDA is used for the comparison between the industries or companies within the same industry in order to understand the profitability by excluding the effects of depreciation, amortization, tax or interests. EBITDA is calculated by adding up net profit, interests, taxes, depreciation and amortisation values or adding depreciation and amortisation on to EBIT value. (Williams, et al., 2012)

3.4 Efficiency Ratios

Efficiency ratios are used to measure the rate of liabilities that could be covered by assets. Efficiency ratios could be listed as net asset turnover rate, stock turnover rate, payables turnover rate, cash turnover rate, and receivables turnover rate (Walsh, 1993). Explanations for these ratios are given below;

Net Asset Turnover Rate

Asset turnover ratio explains the revenue gathered from each dollar of asset. Higher asset turnover rate represents higher replacement of asset value by sales. It is calculated by dividing net sales revenue of company to the average total assets (Powers and Needles, 2012)

Stock Turnover Rate

Stock turnover rate is calculated to understand the ratio of products replaced in the inventory. The reason behind the requirement of this replacement is the sale of the existing products. From that point of view the ratio is calculated by dividing cost of sales to average stock existing. (Mugan and Akman, 2010)

Payables Turnover Rate

Payables rate is calculated in order to understand the replacement of payables after purchases. It is calculated by dividing purchases into average accounts payable. In order to calculate daily ratio of payables, payable turnover rate is multiplied by 1/360. (Mugan and Akman, 2010)

Cash Turnover Rate

Cash turnover ratio is calculated to measure the returned amount of cash to company by sales. This is the reason why it is calculated by dividing net sales amount to cash earned. (Wahlen, Baginski and Bradshaw, 2018)

Receivables Turnover Rate

Receivables turnover ratio is calculated to understand the liquidity or return of the company's receivables. Ratio is calculated by dividing net sales in to average accounts receivables. The higher the ratio of a company is, the more effective and efficient about receivables compared to competitors (Mugan and Akman, 2010)

Chapter 4

METHODOLOGY

Under this chapter, road map of data collection and analysis has been explained by three different titles as; data collection, measures and data analysis. Details about those processes are interpreted below:

4.1 Data Collection

Data set for this research is downloaded from Orbis.net database as secondary data. Secondary data is ready data set collected by somebody else beforehand according to Pallant (2005).

Data set includes financial ratios of 278 companies in automotive industry. Those companies are located in seven different countries which are France, Germany, Italy, Japan, Korea, Spain and Turkey. Values are collected for nine years of period between years 2008 – 2016.

Variables exist in downloaded datasets are analysed by the financial ratios of ROA and ROE using net income, profit margin, gross margin, earnings before interests and taxes (EBIT), earnings before interests, taxes, depreciation and amortization (EBITDA), net asset turnover, stock turnover, liquidity ratio, current ratio, solvency ratio, and gearing ratio. Results of ratio analysis have been organised by total average scores for comparisons.

4.2 Measures

In this research, average of ROA and ROE using net income, profit margin, gross margin, EBIT, EBITDA, net asset turnover, stock turnover, liquidity ratio, current ratio, solvency ratio, and gearing ratio have been calculated for analysis. Calculation of given ratios are represented below;

Table 2: Measures of Financial Ratios

RATIO	FORMULA	RATIO	FORMULA
RETURN ON EQUITY (ROE) - using net income	Net Income / Average Total Equity	**NET ASSET TURNOVER**	Net Sales Revenue / Average Total Assets
RETURN ON ASSETS (ROA) – using net income	Net Income / Average Total Assets	**STOCK TURNOVER**	Cost of sales / average stock existing
PROFIT MARGIN	Net Income / Revenue	**CURRENT RATIO**	Current Assets / Current Liabilities
GROSS MARGIN	Sales Revenue – Direct Cost	**LIQUIDITY RATIO**	(Cash + Marketable Securities) / Current Liability
EBITDA – Earnings before interest, tax, depreciation and amortization	net profit + interests + taxes + depreciation + amortisation	**GEARING RATIO**	Total debt / Total equity
EBIT – Earnings before interest, taxes	Operating Revenues – Operating Expenses	**SOLVENCY RATIO**	(net income + depreciation) / Total liabilities

4.3 Data Analysis

In this study, ratio comparison of companies will be held in intercountry base. To run the analysis, special software SPSS has been used. Descriptive statistics of data as mean, standard deviation and variance have been calculated with SPSS program.

In order to analyse the data for the definition of differences between companies in the same country or for the differences in automotive industry between countries ANOVA test is adopted. Results indicate differences between countries mentioned and results will be represented in the following chapter.

For trend analysis of nine year period, descriptive statistics and financial ratios are arranged and represented by tables for brief explanation and determination.

Chapter 5

RESULTS

The following section represents the results of descriptive statistics, ANOVA test and nine year trend of financial ratios for 2008 – 2016 period. Descriptive statistics section includes average scores, standard deviation, minimum and maximum values about each financial ratio. ANOVA section includes significance test results in order to explain differences among companies in seven countries. Lastly, trend section includes figures for nine-year period in order to explain fluctuations happened in each country for each ratio. (e.g.: Powers and Needles (2012), Williams, et al., (2011), Williams, et al., (2012), Walsh (1993), Muğan and Akman (2010))

5.1 Descriptive Statistics

Descriptive statistics are special measurements in numeric, graph or chart format in order to define and describe the data (Groebner, et al., 2010). In this study, mean scores, standard deviation values, minimum and maximum values will be used for description of companies' situation.

Firstly, mean scores are calculated by dividing the sum of all values into total number of variables. That is to say; mean value is average of all existing values. Secondly, standard deviation value is calculated by taking the square root of variance value. The reason behind taking the square root is to have original unit of value. Variance score represents the distance of value from the mean of all data set; so standard deviation explains the distance of value from mean in real units. Minimum

value is the lowest value that exists in data set. In contrast to that, maximum value is the greatest value. Minimum and maximum values should be considered in order to understand the reason behind the large values of standard deviation (Pallant, 2005).

Under the following section, basic descriptive statistics about automotive companies in different countries will be explained for the financial ratios of; ROA and ROE using net income, Profit Margin, Gross Margin, Earnings before Interests and Taxes (EBIT), EBITDA, Net asset turnover, Stock turnover, Liquidity ratio, Current ratio, Solvency ratio, and gearing ratio. Results for minimum and maximum values are listed in table 3.

Table 3: Minimum and Maximum Values of Financial Ratios

RATIO	Min. Max.	France	Germany	Italy	Japan	Korea	Spain	Turkey
ROE	Min.	-37.52	-53.86	-78.38	-195.06	-257.73	-2.80	-23.44
	Max.	13.88	61.19	8.54	74.74	29.80	10.99	32.50
ROA	Min.	-5.04	-63.34	-5.39	-37.50	-26.99	-1.74	-6.43
	Max.	7.69	23.40	2.08	7.66	15.71	3.19	28.83
Profit Margin	Min.	-0.54	-40.64	-7.93	-15.54	-29.29	-1.41	-12.02
	Max.	25.90	13.63	3.18	14.49	18.60	4.15	29.62
Gross Margin	Min.	-33.06	10.85	27.35	0.00	0.91	41.08	12.92
	Max.	90.00	96.87	59.67	44.50	31.21	41.08	41.64
EBIT	Min.	1.24	-2.74	-7.15	-11.44	-26.70	-1.56	-3.31
	Max.	84.12	29.96	6.37	12.48	14.83	5.82	19.72
EBITDA	Min.	6.04	-0.08	-0.29	-7.93	-24.80	2.43	1.76
	Max.	92.82	21.38	10.82	16.62	15.33	10.74	22.46
Asset Turnover Ratio	Min.	0.00	0.51	0.77	0.44	0.43	1.84	1.12
	Max.	5.17	22.82	3.00	6.68	11.83	4.37	3.46
Stock Turnover Ratio	Min.	0.32	1.77	5.10	3.57	2.38	12.67	1.92
	Max.	17.71	74.96	103.13	142.59	820.67	39.06	20.90
Current Ratio	Min.	0.79	0.37	0.86	0.42	0.47	1.11	1.12
	Max.	2.57	4.44	1.24	6.23	10.90	1.44	11.32
Liquidity	Min.	0.59	0.13	0.50	0.28	0.32	0.88	0.75

24

Ratio	Max.	1.94	3.84	1.21	5.28	10.30	1.21	10.44
Solvency Ratio	Min.	11.37	-22.73	10.83	-13.87	0.94	29.23	21.61
	Max.	86.43	72.05	39.04	84.47	81.13	44.91	91.17
Gearing	Min.	15.82	4.27	111.66	7.06	8.72	11.53	0.96
	Max.	411.64	378.20	471.63	375.81	559.06	149.01	232.13

Return on Equity (ROE)

This ratio represents the returned amount of earnings from equity investments according to Walsh (1993). Higher ratio means higher return gathered from equity. ROE ratio is calculated by net income in order to eliminate differences caused by taxes or country based regulations. Mean and standard deviation values for each country is represented in Figure1.

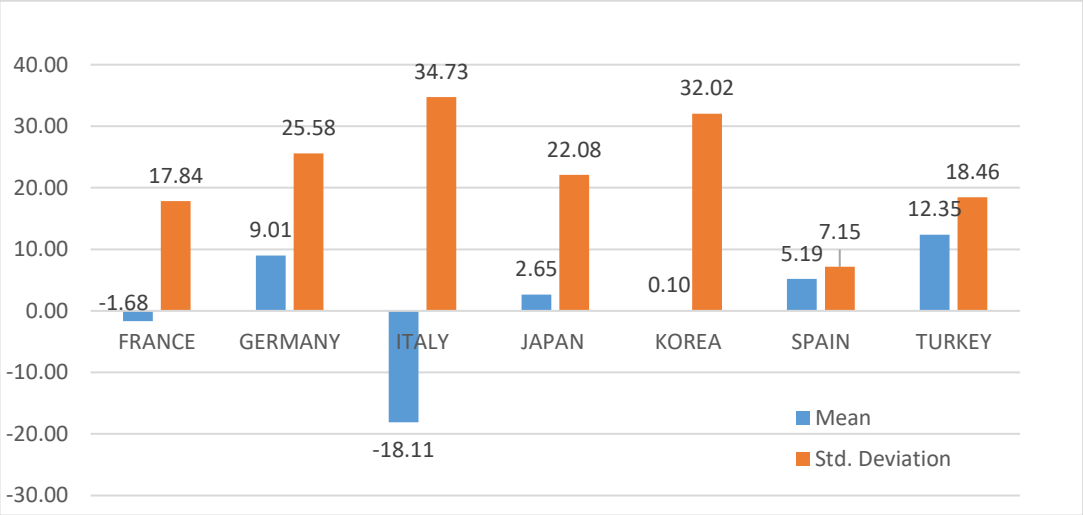

Figure 1: Descriptive Statistics of ROE Ratio

According to descriptive results, Turkey has the highest average for return on equity ratio while Italy has the lowest. France and Italy have negative values at general average. On the other hand, Korea, Spain and Japan have positive but very low ROE values. Turkey and Germany have valuable results in average which means those two countries are achieving better ROE compared to other countries.

In general, standard deviation values are very high. This situation is the result of extreme minimum and maximum values of different companies. Extremely high and low values form up a wide range of values and this leads to higher standard deviation value.

In order to combine the meanings of standard deviation and average values, Spain is the most stable country in industry to gather ROA. Low standard deviation value and small range between minimum and maximum values represent that there is a similar rate for return on equity ratio among the all companies in the country.

Return on Asset (ROA)

ROA ratio represents the efficiency of a company and the rate of earning regathered from firm assets according to Walsh (1993). Ratio is measured by dividing EBIT to total assets. Higher ROA ratio is better because it represents higher return achieved over assets. Figure 2 includes information about descriptive statistics of seven countries for ROA ratio.

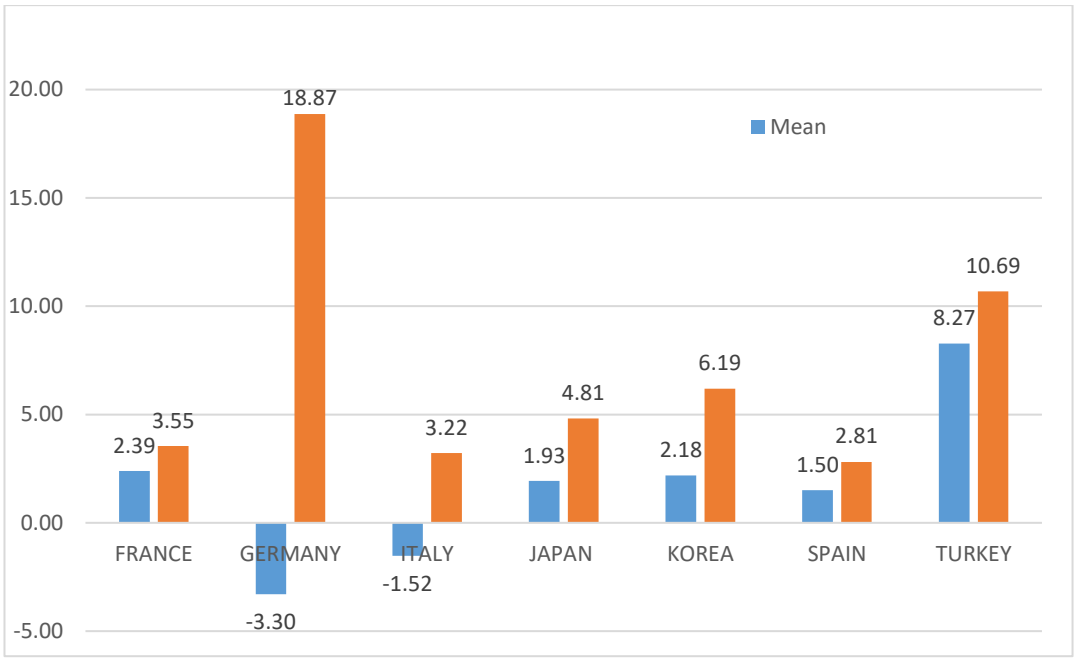

Figure 2: Descriptive Statistics of ROA Ratio

The highest average for ROA value between countries is held by Turkey. France, Japan, Korea and Spain have very close, small and positive rate of returns in average. On the other hand, Germany and Italy have negative rate of return. Negative average results explain that; majority of companies in that country are not able to have returned earnings over their assets.

Standard deviation values for Germany and Turkey are extremely high. In contrast to these two countries, France, Italy, and Spain have small standard deviation values and small number range between minimum and maximum return values of local companies. On the other hand, Italy and Korea have medium range for values and standard deviation.

In order to combine the standard deviation and mean values, the most stable countries for ROA ratio are France and Spain. Although they do not have the highest

average, they have very small standard deviation value. This represents similar return on asset ratio achieved by all companies in the country.

Profit Margin Ratio

Calculation of profit margin ratio is important in order to understand the rate of earnings compared to money earned by the sale of products. Higher ratios are expected to mark higher earnings or profit achieved from revenue**.** Figure 3 presents the descriptive statistic results for France, Germany, Italy, Japan Korea, Spain and Turkey.

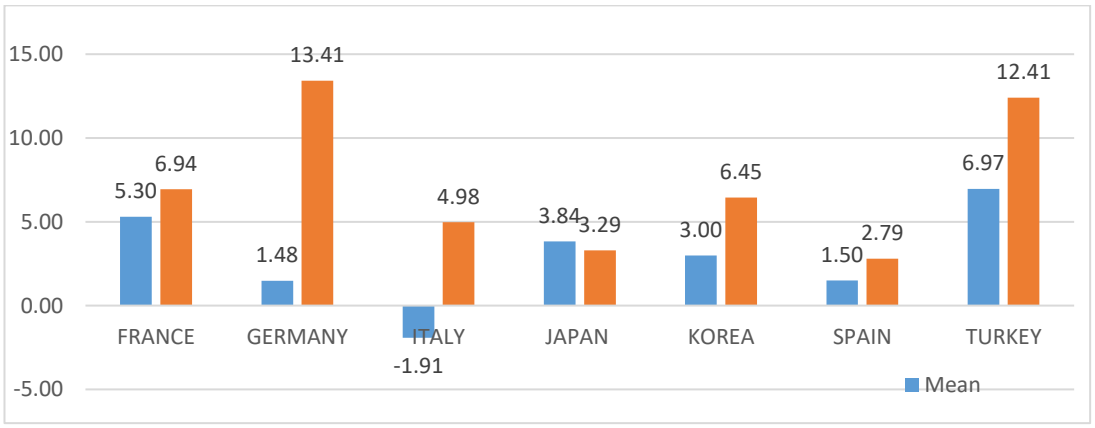

Figure 3: Descriptive Statistics of Profit Margin Ratio

According to mean scores of profit margin ratio, companies in six countries, except Italy, have positive profit margin ratio. Turkey has the highest ratio and France is in second place with very close average to Turkey. On the other hand, Italy has negative profit margin. Majority of companies in Italy have negative profit margin and this general trend creates the negative average. Germany, Japan, Korea and Spain have positive but small profit margin compared to average profit margin ratio of France and Turkey.

Standard deviation values of Germany and Turkey are very high compared to values of Japan and Spain. The reason behind the high standard deviation score of Germany is the wide range of profit margin scores. Out of this comparison, France, Italy and Korea have medium level of standard deviation values.

According to comparison of mean scores and standard deviation values, automotive companies in Japan have the highest similar profit margin ratios. Even the Japan has medium level of standard deviation and average.

Gross Margin Ratio

Gross margin ratio is calculated in order to understand the general amount of capital earned from revenue after deducting the direct costs. If there is large revenue and low gross margin ratio, then it means the company or companies in a country are faced with high level of direct costs. (Walsh, 1993). Figure 4 has descriptive statistics for seven country.

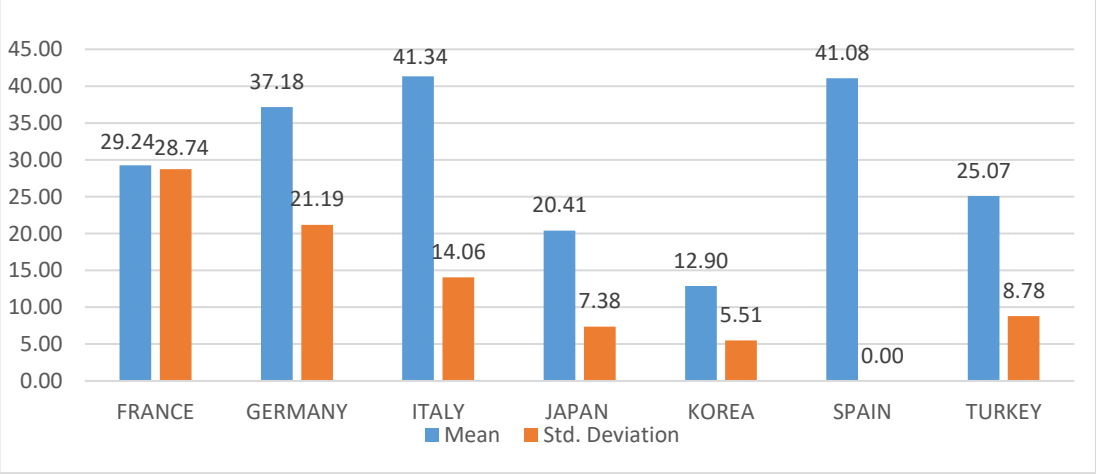

Figure 4: Descriptive Statistics of Gross Margin Ratio

All countries have positive values on average. Italy has the highest gross margin ratio, in contrast, Korea has the lowest average. In general, European countries drive higher average than Far East countries and Turkey.

France has the highest standard deviation and Germany follows Italy with a very high score. The reason behind that is the wide range of ratio values. One of the companies in Germany has achieved maximum value across the country and between among all countries. Nevertheless, Germany could not achieve to have highest average compared to other countries. This result is the conclusion of very low gross margin rates existing in the country and from for that reason standard deviation is high.

In combination of standard deviation values and average scores, Spanish companies gives perfect result with zero standard deviation and very high mean score, but these values are the result of missing data for the last six years of chosen time period. Because of this reason, results would not be reliable and are not taken into account.

If results about Spain are ignored because of the factors explained above, Italy has medium level of standard deviation with high level of gross margin ratio average. This means, companies in Italy have closer and similar values in general compared to other countries.

EBIT and EBITDA

EBIT is the amount of earnings after expenses are subtracted from revenue and before the interests and taxes are paid out. (Williams, et al., 2012)

Interest rates and tax percentages are changing from country to country. That is the reason why comparison of EBIT for companies in different countries is more reliable than comparing the net income.

Earnings before interest, taxes, depreciation and amortisation (EBITDA) is calculated by adding up amortisation and depreciation costs to EBIT value. Depreciation cost is the cost of decreasing value of equipment or materials. Amortisation is the loss of value over intangible assets of company over time. (Williams, et al., 2012)

If there is a huge difference between EBIT and EBITDA value for a company, this means value loss for tangible and intangible assets of company is very high. Figure 5 includes descriptive statistic values for EBIT and EBITDA ratios. Ratios will be analysed separately and respectively. After the analysis, two ratios will be compared in order to understand the rate of value loss for companies in different countries.

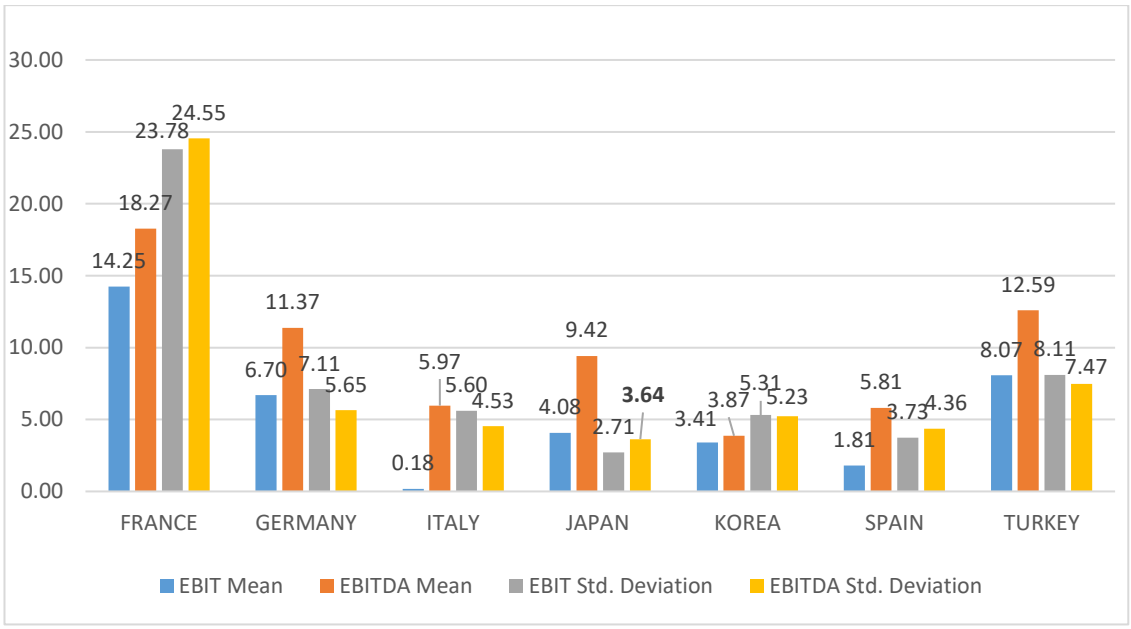

Figure 5: Descriptive Statistics of EBIT and EBITDA Ratio

France has the highest average value of EBIT and EBITDA compared to Germany, Italy, Japan, Korea, Spain and Turkey. On the other hand, Italy has the lowest EBIT value while Korea has the lowest EBITDA ratio in average.

France has the highest standard deviation value for both EBIT and EBITDA ratios. This result is directly proportional with the range of EBIT and EBITDA values of companies in the country. Japan has the lowest standard deviation of EBIT and EBITDA ratio. That is to say, it is the country with the most similar ratios existing among companies.

From the difference of EBIT and EBITDA, depreciation and amortisation rate for companies would be defined. Among the seven countries, Korea has the smallest difference. This result represents that, companies in Korea has the smallest rate for depreciation and amortisation. On the contrary, Italy faces the highest depreciation and amortisation ratio compared to others.

Asset Turnover Ratio

Asset turnover ratio is used to understand the amount of assets used for creating sales. Value of turnover rate represents the sale generated by each dollar of asset. (Powers and Needles, 2012).Figure 6 includes descriptive statistics of countries.

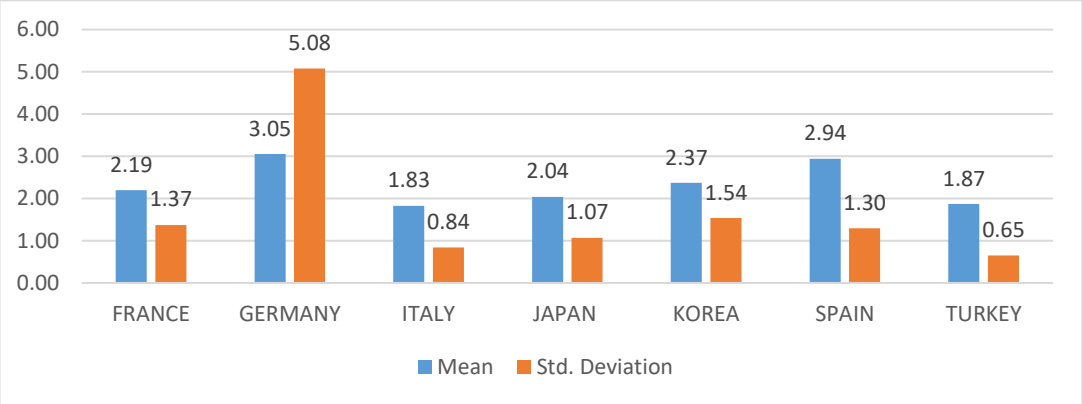

Figure 6: Descriptive Statistics of Asset Turnover Ratio

All seven countries have positive asset turnover ratio but Germany has the highest mean score. According to the given results, Germany is the best country to generate sales from each dollar of assets, while Italy has the lowest average for asset turnover ratio. That is to say, companies in Italy are the worst to generate sales for each dollar of asset. In general, seven countries have very close value of asset turnover ratio.

Standard deviation value of the six countries; France, Italy, Japan, Korea, Spain and Turkey is very close. In contrast to them, Germany has the largest standard deviation. Standard deviation value of Germany is more than double of the other countries. The reason behind that is the wide range of asset turnover rate average held by German companies.

Turkey has the minimum standard deviation value. Small number of standard deviation represents small distance of values to mean. In other words, companies in

Turkey have much more asset ratio balance and similarity with each other compared to other country companies.

Stock Turnover Ratio

Turnover ratio is used to explain the replacement rate of measured factor. From that point of view, stock turnover ratio measures how many times does stock is sold out and replaced. (Mugan and Akman) Figure 7 represents the stock turnover rate average, standard deviation values, minimum and maximum values existing in each country.

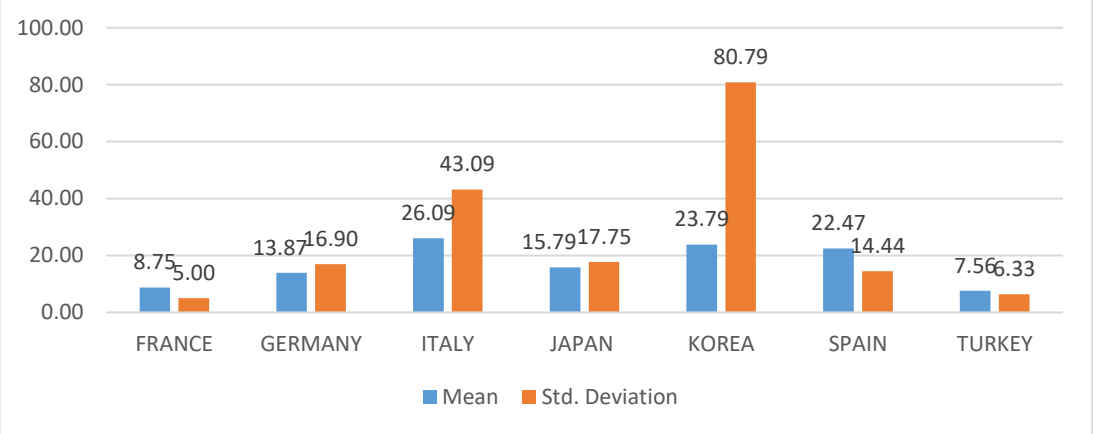

Figure 7: Descriptive Statistics of Stock Turnover Ratio

The highest stock turnover average is achieved by Italian companies. This means Italian companies are best to achieve sales and require stock replacement. In contrast, Turkish companies created the lowest average of stock turnover rate between the seven countries. Besides, French companies have very close average to Turkish companies

Korea has extremely high standard deviation value. This huge value is caused by one of the companies in the country which has a very high stock turnover ratio. In contrast to Korea's standard deviation value, France has the lowest standard

deviation. Low standard deviation value represents close numbers in data set or small number range for all values. That is to say, automobile companies in France have closer values of stock turnover ratio compared to other country companies.

Current Ratio

Current ratio is a liquidity ratio that measures the situation between current assets and current liabilities. This ratio is mostly used by banks to understand a company' situation (Walsh, 1993). The result of measurement is expected to be at least zero to represent balance between assets and liabilities. If the score is negative, it indicates that the company is facing debt. On the other hand, positive ratios are symbolising more asset values than existing liabilities. Figure 8 interprets the descriptive statistic measurements for seven countries**.**

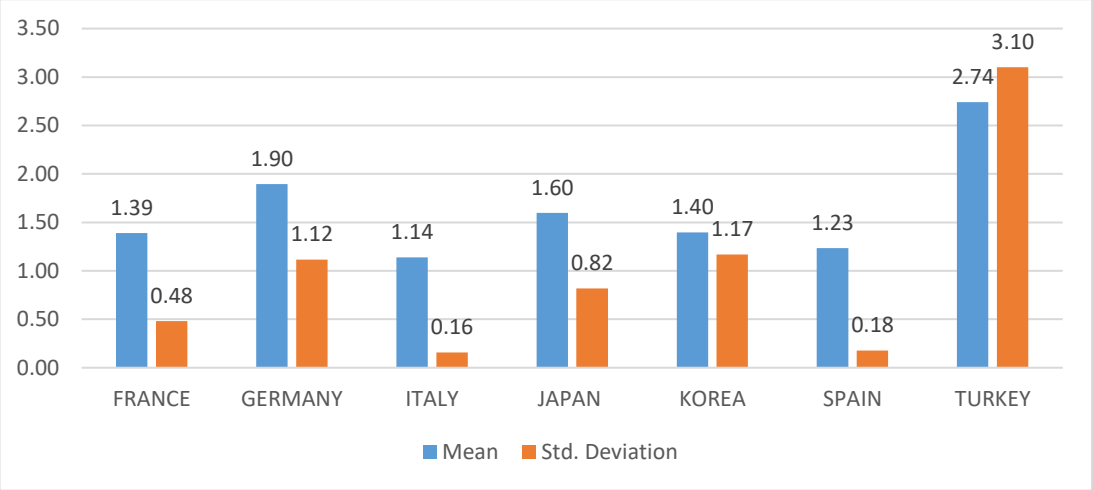

Figure 8: Descriptive Statistics of Current Ratio

All seven countries have very close number of current ratio averages. Turkish companies have the highest current ratio average compared to other countries. According to Table 3, minimum value of current ratio for Turkish companies is almost the same with maximum current ratio number of Italian companies.

Turkey also has the greatest standard deviation value. Value is almost triple of other countries standard deviation value and this represents that not all companies in Turkey are achieving similar current ratio value.

Italy has the smallest standard deviation value which means that companies in Italy have very close average values compared to other countries average. This indicates that, there is almost similar current ratio value for each company in Italian automotive sector.

Liquidity Ratio

Liquidity ratio represents the convertibility of assets into cash in order to survive with company payments. High liquidity ratio means high ability of converting assets into cash and it is an amazing strength for a company. (Walsh, 1993). Figure 9 represents average value, standard deviation, maximum and minimum values for all countries**.**

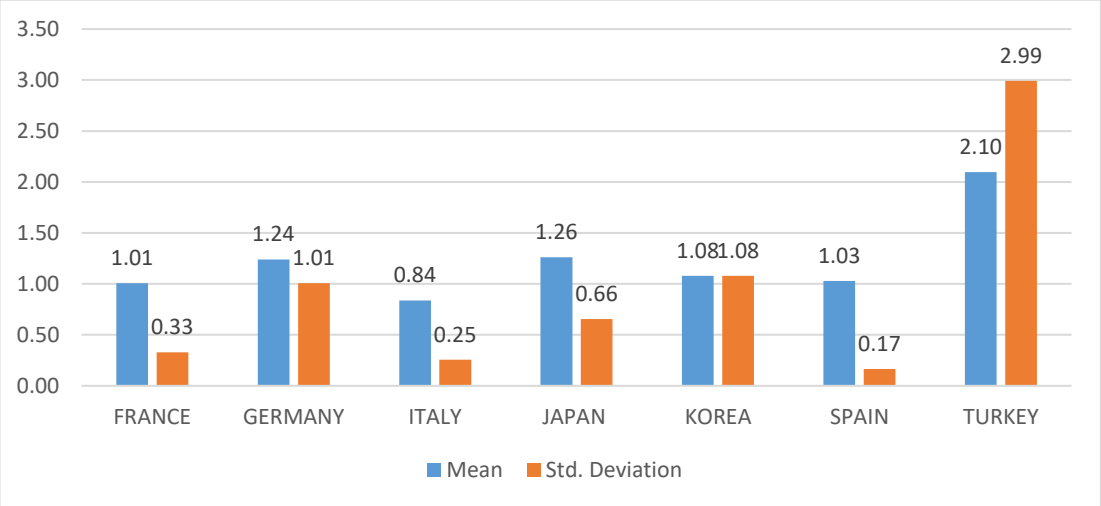

Figure 9: Descriptive Statistics of Liquidity Ratio

General liquidity ratio of companies in six countries; France, Germany, Italy, Japan, Korea and Spain are very similar. In addition, Turkey almost has double of liquidity ratio average of other countries.

Turkey also has the highest standard deviation rate because liquidity ratio averages of Turkish companies are not similar with each other. On the other hand, Spain has the smallest standard deviation value which means Spanish automotive companies have almost the same liquidity ratio average.

Solvency Ratio

Solvency ratio represents the rate of company ability to pay its liabilities. Higher solvency ratios are the result of high ability of a company to pay its liabilities. Figure 10 explains about solvency ratio situation in France, Germany, Italy, Japan, Korea, Spain and Turkey**.**

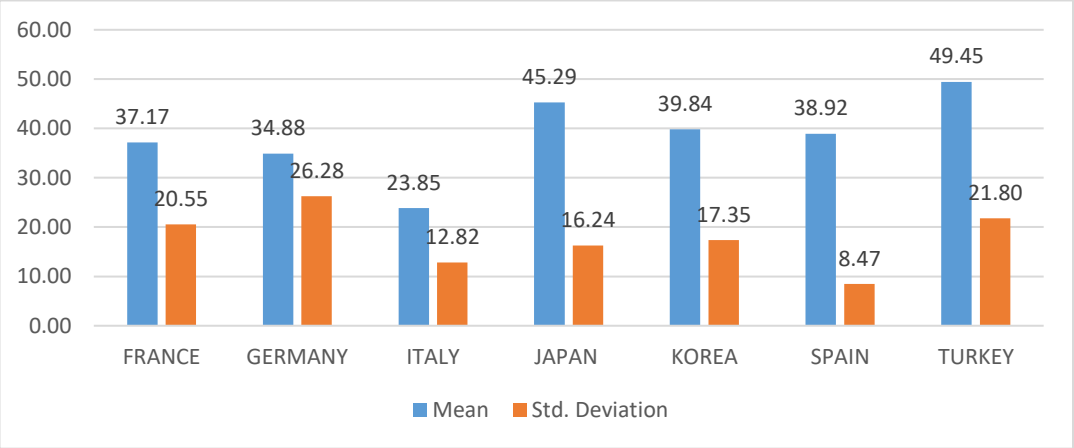

Figure 10: Descriptive Statistics of Solvency Ratio

Turkey has the highest solvency ratio average which shows Turkish companies have the highest ability to pay their liabilities. In contrast, Italian companies have the

lowest ability for liability payments compared to other six countries. Other five countries; France, Germany, Korea and Spain have very close averages in between Turkey's and Italy's average. Japan is another country with high solvency ratio average, very close to Turkey's value.

Standard deviation values of Germany, France, and Turkey are very close to each other but Germany has the highest value. Japan, Korea and Italy are three countries with similar standard deviation values in the middle.

Spain has the lowest standard deviation value which means that most of the companies have similar solvency ratio value in the country. In addition, Spain has a good average value for solvency ratio and combination of these two descriptive statistics are representing that, most of the companies in Spain have good ability to pay their liabilities compared to other country companies.

Gearing Ratio

Gearing ratio is calculated to measure ratio of financially owned funds compared to company equity. High gearing ratio symbolizes high rate of funds taken. As a result, high gearing ratio is representative of high financial risk (John, Arnold, and Southworth, 1944). Descriptive statistics about seven countries are shown in Figure 11.

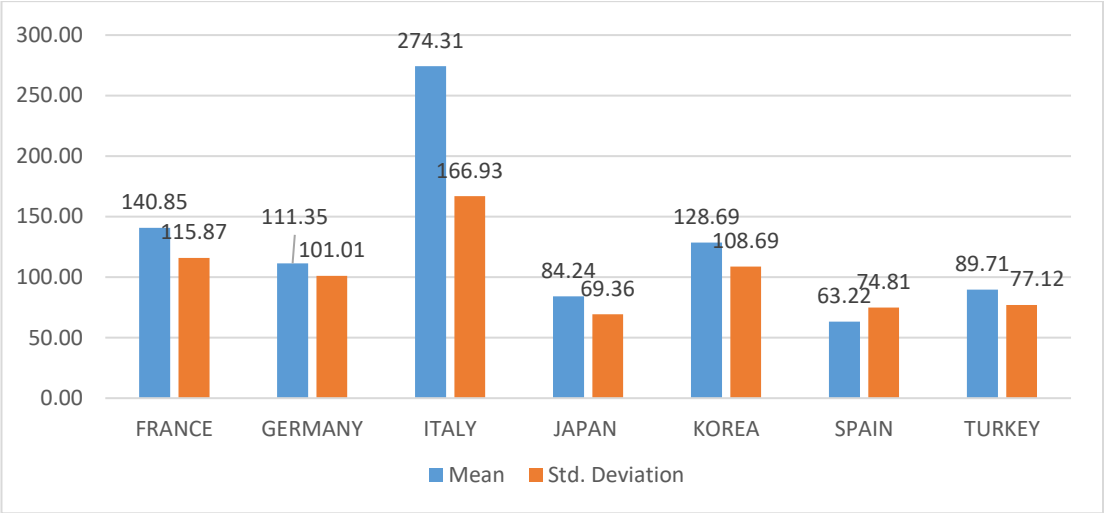

Figure 11: Descriptive Statistics of Gearing Ratio

Italian automotive companies have the highest gearing ratio average. This means Italian automotive industry carries out the highest financial risk by taking funds. Spain is the country with the lowest average. Spanish companies have smallest financial risk compared to other six countries.

Similar to average results, Italy has the highest standard deviation value compared to other countries. This represents very different and separated gearing ratios between Italian automotive companies. In contrast, Japanese companies have very similar and closer gearing ratio averages among the seven countries.

In order to summarise, companies in Spanish automotive industry have most common and similar average values compare to other countries' automotive industry. Turkey has highest average value among the other countries for ratios; ROE, ROA, profit margin, current ratio, liquidity ratio, and solvency ratio.

Table 4: List of countries with minimum or maximum financial ratio value

RATIO	COUNTRY WITH MINIMUM AVERAGE	COUNTRY WITH MAXIMUM AVERAGE
ROE	ITALY	TURKEY
ROA	GERMANY	TURKEY
PROFIT MARGIN	ITALY	TURKEY
GROSS MARGIN	KOREA	ITALY
EBIT	ITALY	FRANCE
EBITDA	KOREA	FRANCE
ASSET TURNOVER RATIO	TURKEY	GERMANY
STOCK TURNOVER RATIO	TURKEY	ITALY
CURRENT RATIO	ITALY	TURKEY
LIQUIDITY RATIO	ITALY	TURKEY
SOLVENCY RATIO	ITALY	TURKEY
GEARING RATIO	SPAIN	ITALY

According to Table 4, Italy has the most fluctuating average scores of descriptive statistics. The most important and risky factor for Italian automotive industry is to have the highest average of gearing ratio. This value represents high financial risk taken by Italian companies by taking higher funds compared to equity.

Turkey has the highest average for half of the financial ratios. Automotive industry in Turkey still needs to be improved, because the country still has fluctuating minimum or low values for averages of important ratios like asset turnover or stock turnover. Especially low stock turnover ratio represents low number of automobile sales covered in the country. Descriptive values of Germany, France, Japan, Korea and Spain have middle average financial ratio values in general.

5.2 ANOVA Test Measures

Analysis of variance (ANOVA) is used to define variability of data scores among different groups. From the test results, significance values are analysed. Significant results represent the difference existing among the measured variables according to Pallant (2005).

Significance level for test is 5%. Values with significance score lower than this level would be accepted as a symbol of significant difference between the mean scores. Under the following section, differences among the countries analysed for each of the financial ratios separately. Results of ANOVA test are represented in Table 4. (E.g. Pallant (2005))

Table 5: ANOVA test results

RATIO	COUNTRY	MEAN	F	SIGNIFICANCE
ROE	FRANCE	-1.68	1.07	0.38
	GERMANY	9.01		
	ITALY	-18.11		
	JAPAN	2.65		
	KOREA	0.10		
	SPAIN	5.19		
	TURKEY	12.35		
ROA	FRANCE	2.39	3.05	**0.01**
	GERMANY	-3.30		
	ITALY	-1.52		
	JAPAN	1.93		
	KOREA	2.18		
	SPAIN	1.50		
	TURKEY	**8.27**		
PROFIT MARGIN	FRANCE	5.30	1.76	0.11
	GERMANY	1.48		
	ITALY	-1.91		
	JAPAN	3.84		
	KOREA	3.00		
	SPAIN	1.50		

	TURKEY	**6.97**		
GROSS MARGIN	**FRANCE**	29.24	22.77	**0.00**
	GERMANY	37.18		
	ITALY	**41.34**		
	JAPAN	20.41		
	KOREA	12.90		
	SPAIN	41.08		
	TURKEY	25.07		
EBIT	**FRANCE**	**14.25**	6.16	**0.00**
	GERMANY	6.70		
	ITALY	0.18		
	JAPAN	4.08		
	KOREA	3.41		
	SPAIN	1.81		
	TURKEY	8.07		
EBITDA	**FRANCE**	**18.27**	13.06	**0.00**
	GERMANY	11.37		
	ITALY	5.97		
	JAPAN	9.42		
	KOREA	3.87		
	SPAIN	5.81		
	TURKEY	12.59		
ASSET TURNOVER RATIO	**FRANCE**	2.19	1.14	0.34
	GERMANY	3.05		
	ITALY	1.83		
	JAPAN	2.04		
	KOREA	2.37		
	SPAIN	2.94		
	TURKEY	1.87		
STOCK TURNOVER RATIO	**FRANCE**	8.75	0.41	0.87
	GERMANY	13.87		
	ITALY	26.09		
	JAPAN	15.79		
	KOREA	23.79		
	SPAIN	22.47		
	TURKEY	7.56		
CURRENT RATIO	**FRANCE**	1.39	2.75	**0.01**
	GERMANY	1.90		
	ITALY	1.14		
	JAPAN	1.60		
	KOREA	1.40		
	SPAIN	1.23		
	TURKEY	**2.74**		

LIQUIDITY RATIO	**FRANCE**	1.01	1.82	0.10
	GERMANY	1.24		
	ITALY	0.84		
	JAPAN	1.26		
	KOREA	1.08		
	SPAIN	1.03		
	TURKEY	2.10		
SOLVENCY RATIO	**FRANCE**	37.17	2.76	**0.01**
	GERMANY	34.88		
	ITALY	23.85		
	JAPAN	45.29		
	KOREA	39.84		
	SPAIN	38.92		
	TURKEY	**49.45**		
GEARING RATIO	**FRANCE**	140.85	5.22	**0.00**
	GERMANY	111.35		
	ITALY	**274.31**		
	JAPAN	84.24		
	KOREA	128.69		
	SPAIN	63.22		
	TURKEY	89.71		

According to the above results, ROE ratio, profit margin ratio, asset turnover ratio, stock turnover ratio and liquidity ratio are not statistically significant. Insignificant results represents the lack of differences among compared variables.

On the other hand, there are significant results for ROA ratio, gross margin ratio, EBIT ratio, EBITDA ratio, current ratio, solvency ratio and gearing ratio among countries. Significant values are representative for existence of differences among compared variables.

Significance value of ROA ratio is 1% which is below the significance level (5%). Turkey has the highest return on asset average with 8.27%. In addition, Turkey has the highest average of current ratio and solvency ratio with percentages of 2.74% and

49.5% respectively. These results are explaining that; automotive companies in Turkey have a better ROA value compared to other country companies. High solvency value represents better financial strength to pay liabilities by assets and high current ratio explains that companies in Turkey have the highest liquidity for turning assets into capitals for payments of liabilities.

Gross margin ratio has significant value from ANOVA test. Italy has the highest percentage of gross profit compared to other countries. In contrast to that, France has significantly the most different and the highest average of EBIT and EBITDA ratio. These results explain that, Italian companies are facing high rate of indirect costs.

Italy has the extremely high gearing ratio average among the other countries. This huge difference creates 1% significance value. Gearing value of Italy is almost double of the values of other countries but this is not an advantage for a country. High gearing ratio represents high rate of funds taken compared to equity and this situation is directly proportional with financial risk.

5.3 Trend of Financial ratios in nine years period

Trend is the most frequent direction or movement existing for analysed period of time (Kim and Fiore, 2011). According to this definition, trend analysis for financial ratios would be explained as the general direction analysis of financial ratios for period of time. Trend analysis is a type of horizontal analysis in order to identify the changes among the years in percentages (Powers and Needles, 2012).

Under the following part trends of ROA ratio and ROE ratio using net income, Profit Margin, Gross Margin, Earnings before Interests and Taxes (EBIT), EBITDA, Net asset turnover, Stock turnover, Liquidity ratio, Current ratio, Solvency ratio and

gearing ratio for seven countries will be represented for nine years period by graphs. (E.g. Powers and needles 2012, Groebner, Shannon, Fry and Smith (2011))

Return on Equity Trend

According to Figure 12, Germany, Japan, Korea, Spain and Turkey have small fluctuations on return on equity ratio. Ratio values for those countries are changing between zero and twenty in nine years of period.

France has similar fluctuations with the other five countries mentioned above for the first seven years. After year 7 (2014), a sharp decrease occurs in average return on equity values of French companies.

Italy is the country in the worst situation compared to other countries. Italian automotive industry has extreme fluctuations of return on equity ratio. In years 2008, 2012, 2013 and 2016 ROE value average in the country sharply decreases.

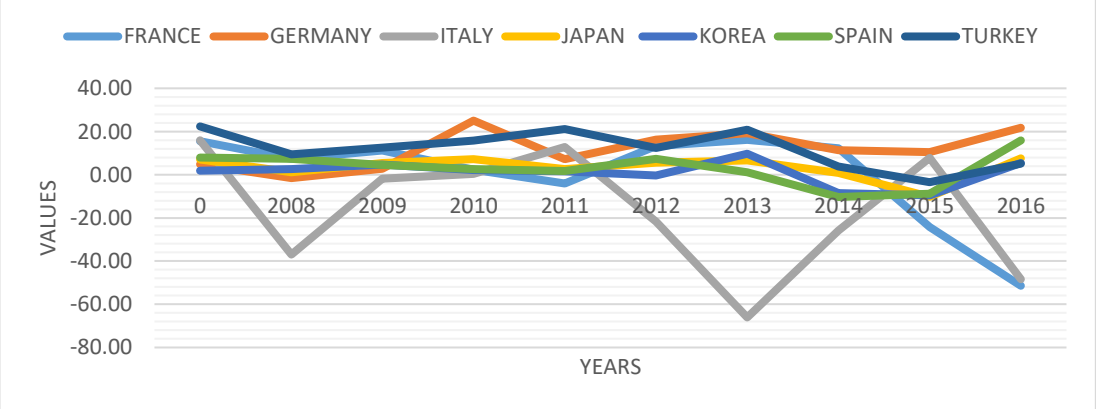

Figure 12: Trend analysis of ROE ratio

Return on Asset Trend

According to the results displayed on Figure 13, France has fluctuations between the years 2008 – 2013. In 2014 and 2015 a slight decrease occurs in ROA ratio. Last year rapid increase starts on average. In contrast, Korea has the most stable trend of ROA value for 9 years of period with very small fluctuations.

ROA average trend in Germany decreases in 2009 for one year and follows continuous increase until the end of time period. Japan has almost stabilised trend throughout the period. There is only a small decrease in 2015 and average started to increase again in 2016. Similar trend occurs with Spain. The difference is the decrease in ROA trend which occurred in 2014 and 2015, then increased in last year of period.

Italy has a slightly decreasing trend between years 2008 – 2012 and a sharp decrease in 2013. Then average of return on asset ratio starts to rise for the last two years of period. Turkey has the highest average for the first five-year of period. After 2012 fluctuations start and in 2015 a sharp decrease occurs over return on asset ratio average of the country. In 2016, averages start to increase again.

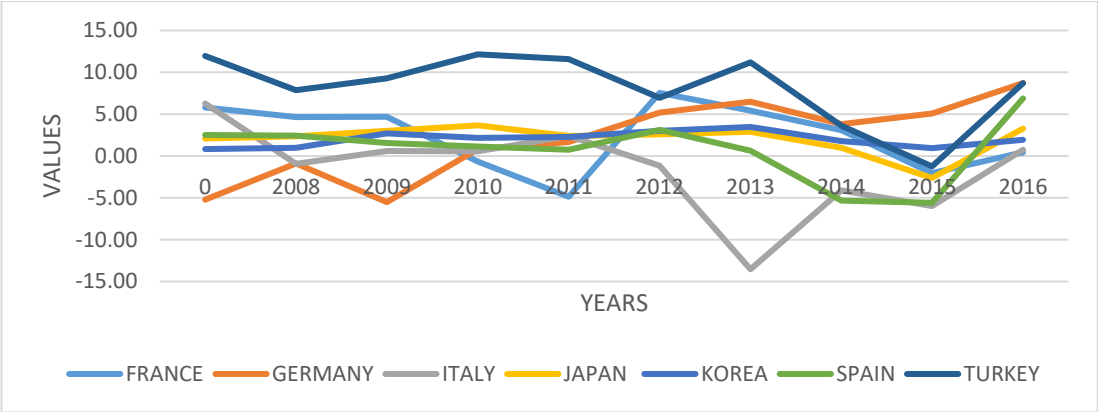

Figure 13: Trend analysis of ROA ratio

Profit Margin Trend

In general, all countries face decreasing trend in 2015 and increasing trend in 2016. This common trend will be easily understood from the Figure 14.

Japan and Spain have slightly decreasing trend until 2015. France and Turkey have fluctuations between 2008 and 2015. Korea and Germany have slightly increasing trend for the first seven-year period. Separately from all countries, Italy has a very unstable trend. Fluctuations are sharp and extremely opposite of each other.

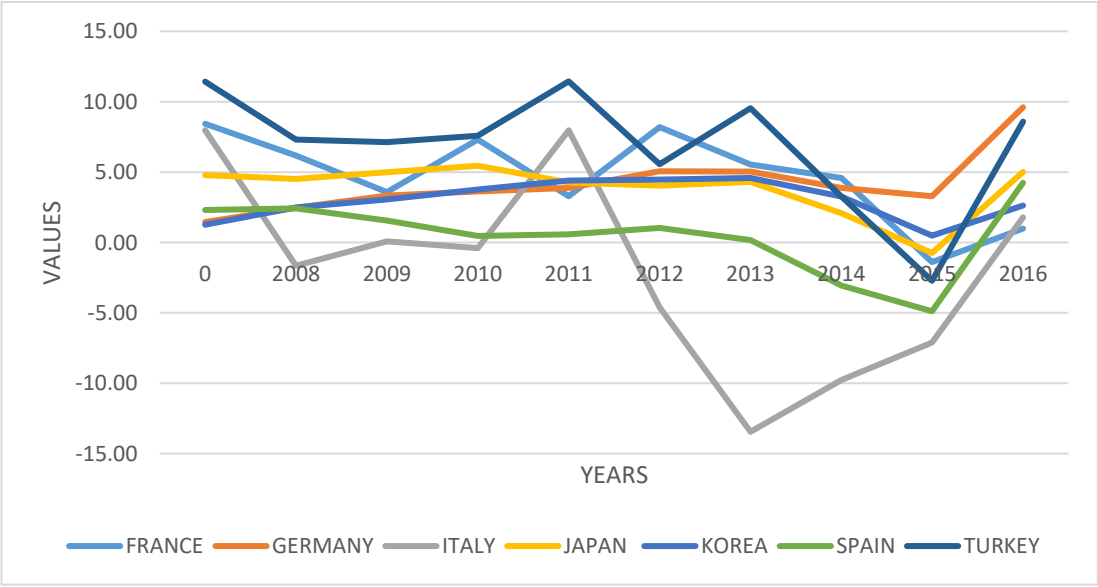

Figure 14: Trend analysis of Profit Margin ratio

Gross Margin Trend

Gross margin or gross profit is profit remains after direct costs are subtracted. Far East countries, Japan and Korea have constant trend for all period**.**

Germany is the only country which has a slight increase. In data set, there is absence of data for Spain. Because of this reason trend in that country is undefined. France has fluctuations in gross margin trend between years 2008 – 2010. There is a constant trend until 2015 and gross profit average of country starts to rise down in 2016.

Turkey has small fluctuations until 2013. After this year Gross margin average in automotive sector starts to decrease. In contrast to Turkey, Italy has a decreasing trend for nine year period with a sharp decrease in 2013.

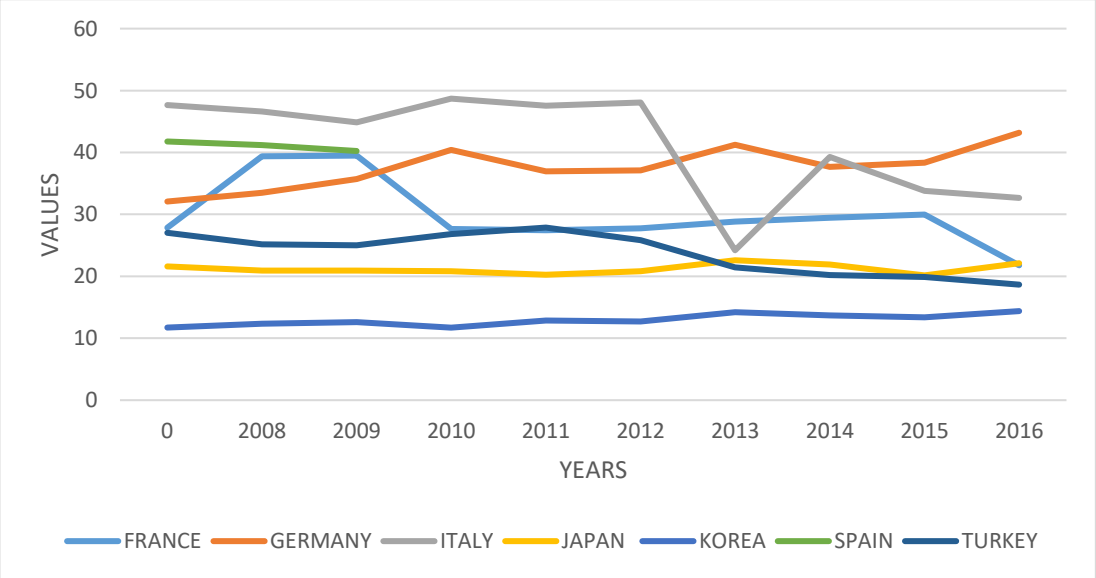

Figure 15: Trend analysis of Gross Margin ratio

Earnings before Interest and Tax Trend

Figure 16, represents the results of trend analysis for seven countries for EBIT ratio. According to the chart, European countries (France, Germany and Spain) except Italy have a similar trend for the whole period. In contrast to European countries, Far East countries have an opposite trend of each other. Japan has slightly decreasing line where the Korea has slightly increasing values.

Turkey has constant EBIT average until 2013. After this period values are slightly decreasing. Similar to all other existing trends for different ratios, France has a slight decrease until 2012, a sharp decrease in 2013 and a sharp increase in the last two years of period.

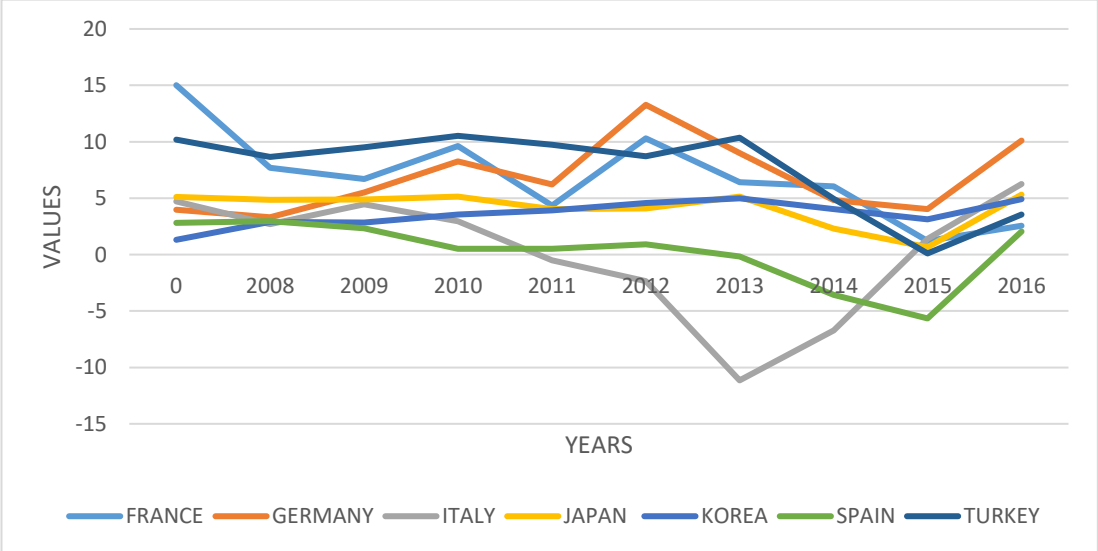

Figure 16: Trend analysis of EBIT ratio

Earnings before Interest, Tax, Depreciation and Amortisation Trend

Earnings before interest tax, depreciation and amortisation trend is slightly different from the trends of other ratios. Japan has almost the most stable trend while Italy has

a decreasing trend until 2013, a sharp decrease in 2014 and a slight rise until the end of the period.

Korea and Germany have a rising trend with small fluctuations in 9 years; Turkey has a small increase in the first four years and decrease for continuing other four years. Spain and France have a decreasing trend during the first eight years and in 2016 a slight increase on averages is started. Common trend for all countries is the increase of EBITDA averages in 2016.

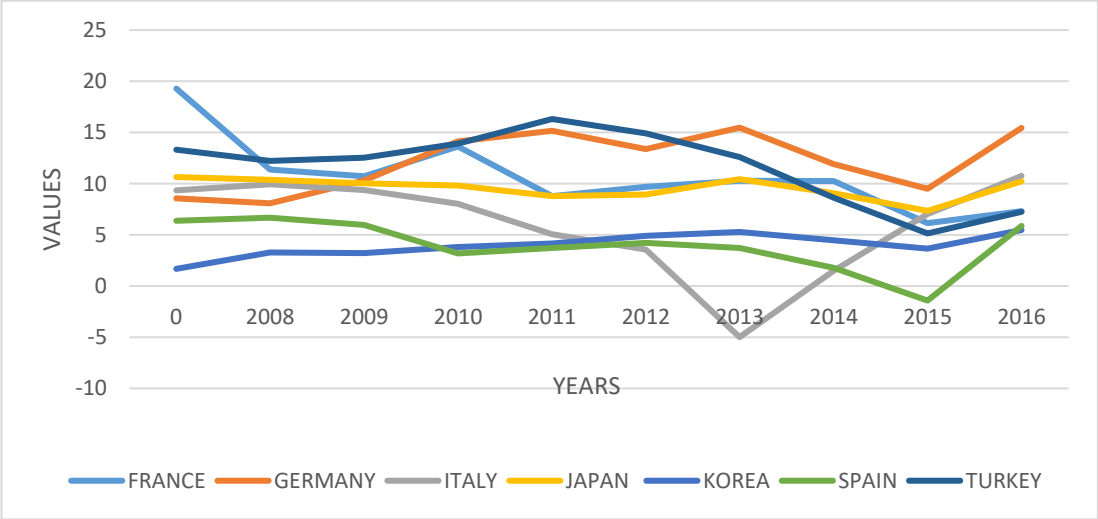

Figure 17: Trend analysis of EBITDA ratio

Net Asset Turnover Trend

All countries have a common rising trend for asset turnover ratio in 2016. Before that; Japan and Italy have constant turnover ratios.

Germany is faced with fluctuating trend until 2011 and then continues with constant average trend. In contrast, Spain has important fluctuations about asset turnover rate with decreasing trend until 2015.Turkey has a slightly increasing trend until 2013,

followed by a sudden decrease until 2015 and an increasing trend in the last year. France and Korea have constantly an increasing trend in nine years of period.

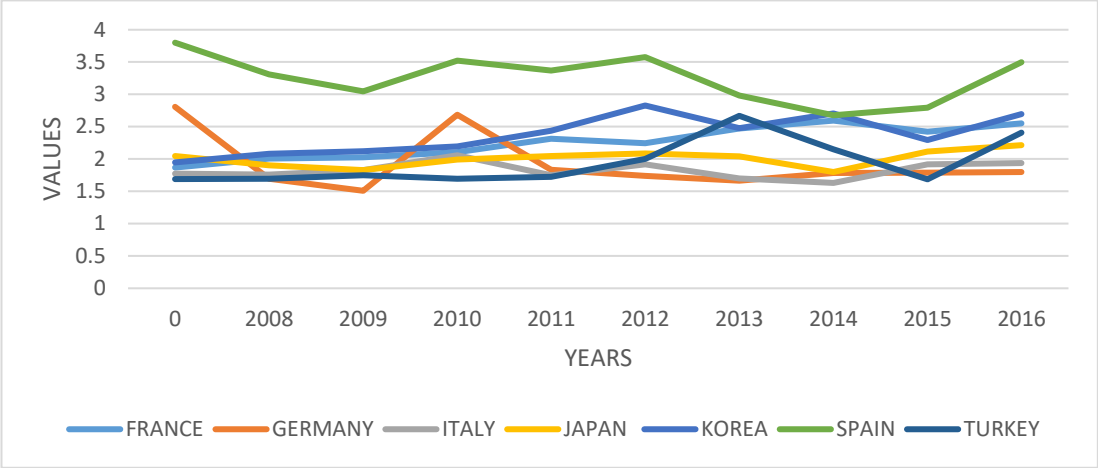

Figure 18: Trend analysis of Asset Turnover ratio

Stock Turnover Trend

According to the results represented in Figure 19; France, Germany, Japan and Turkey have almost constant stock turnover rate with very small fluctuations.

In contrast to these four countries trend, Italy has extreme fluctuations for the whole period. In 2009 and 2013, sharp increases exist with average values but in general Stock turnover ratio of country decreases into more than half of starting average at the end of 2016.Korea has an increase in turnover ratio for the first two years. After 2009, average values remain constant with small fluctuations until the end of the period.

Spain has an increasing trend in 2008 and 2009 followed by a slight decrease until 2015 and in 2016 average values start to rise up again.

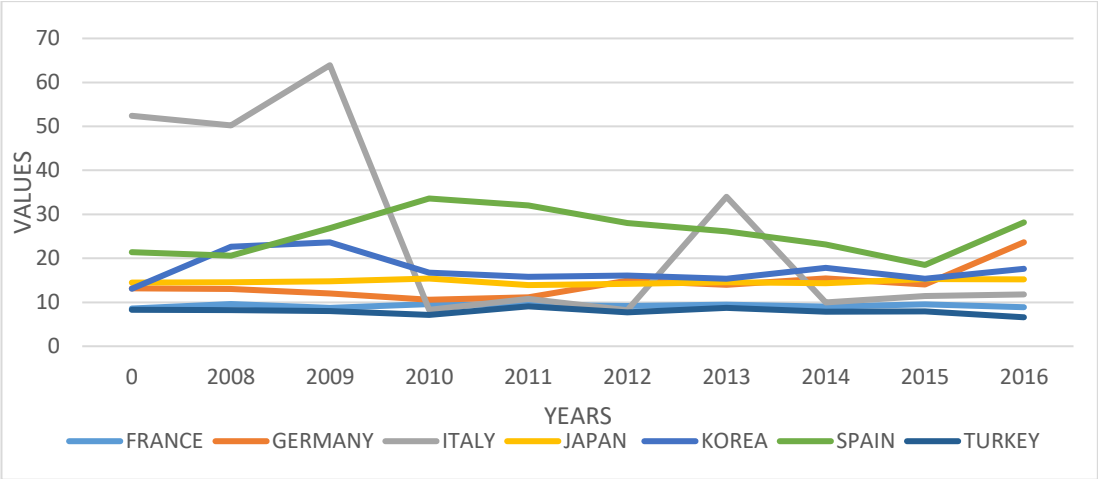

Figure 19: Trend analysis of Stock Turnover ratio

Liquidity Ratio Trend

Results of liquidity ratio trend are represented by Figure 20. France, Italy, Japan, Korea and Spain have almost constant trends for liquidity averages with small fluctuations. Turkey has an increasing trend with sharp rises in 2013 and 2016. Similar with Turkey, Germany had sharp fluctuation in 2011 but after 2012, trend of liquidity averages in Germany remains constant.

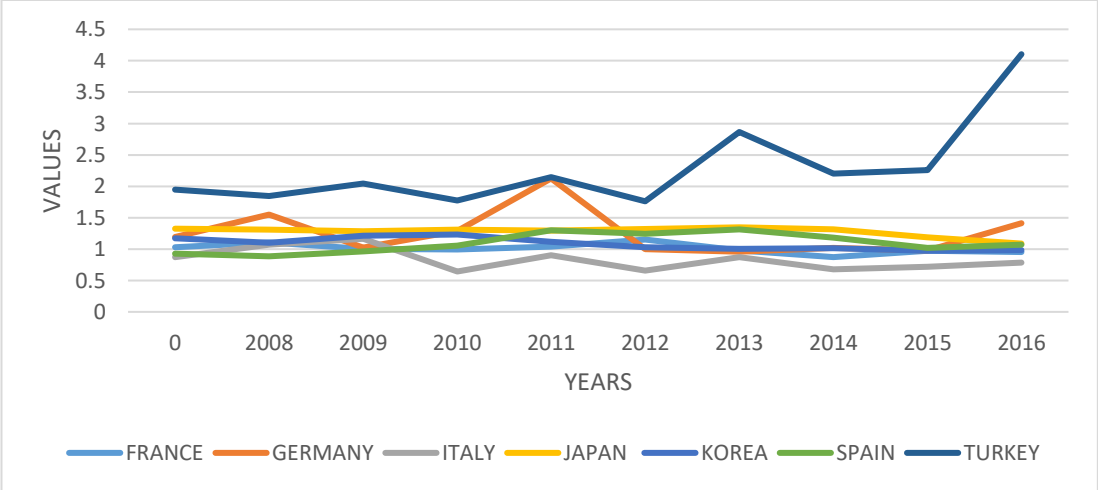

Figure 20: Trend analysis of Liquidity ratio

Current Ratio Trend

According to the results represented in Figure 21; France, Italy, Japan, Korea and Spain have Constant current ratio trend during the nine year period.

Turkey has a stable trend until 2012, then a rising trend of current ratio appears until the end of the period. In contrary, Germany has fluctuating trend until 2012 and constant averages until 2015. In 2016, a slight increase has started in current ratio average of Germany.

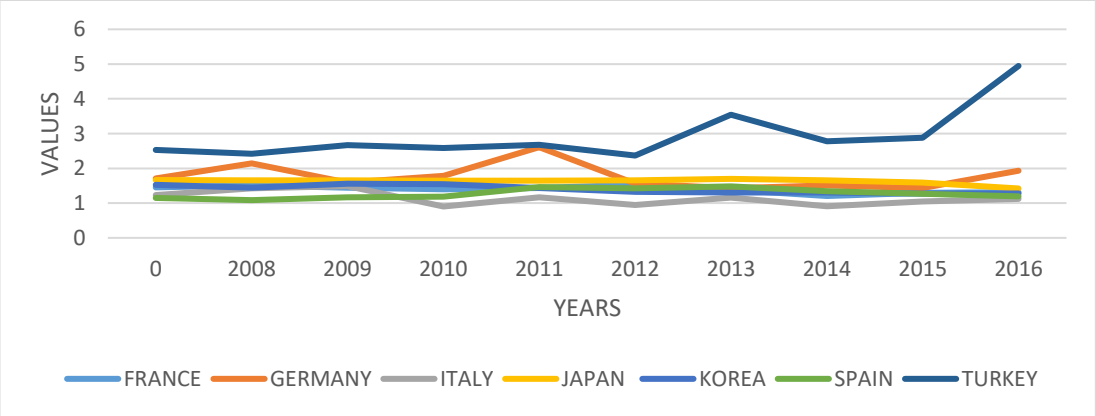

Figure 21: Trend analysis of Current ratio

Solvency Ratio Trend

Figure 22 interprets the results of solvency ratio average for seven countries. In the light of the existing diagram, it is visible that Italy, Japan and Korea have constant values.

Germany and Turkey have small fluctuations in 2010. Spain and France have constant trend similar to three countries mentioned above until 2015. In 2015,

Turkey, Spain and France faces a fluctuation. Turkey and Spain manage to rise solvency ratio average, In contrast, France faces a sharp decrease of solvency averages**.**

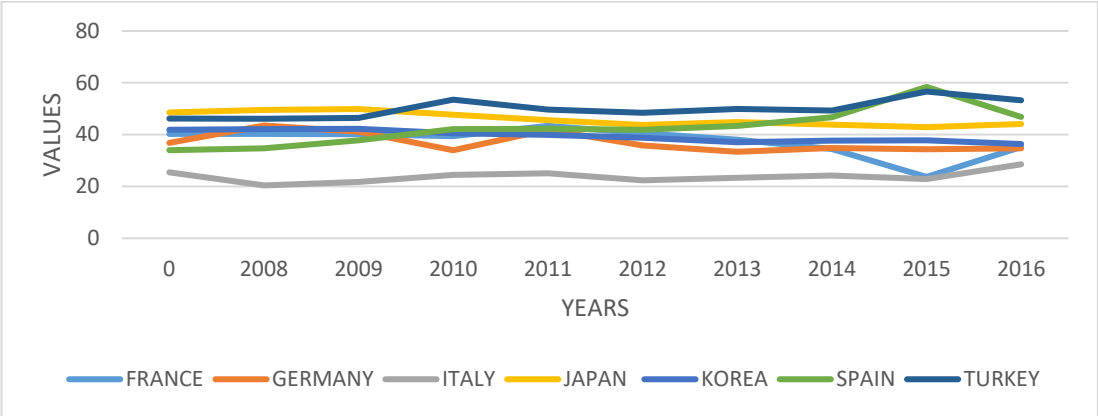

Figure 22: Trend analysis of Solvency ratio

Gearing Ratio Trend

As a common trend; Japan, Germany, France and Korea have a slightly increasing trend during the nine year of period. In contrast, Spain, Italy and Turkey have slightly decreasing trend. Among these three countries, Italy has a fluctuation in 2014.

In contrast to all other ratios measured above, gearing ratio is expected to be low. That is the reason why, decreasing trend of Spain, Italy and Turkey is a positive achievement. Results are represented over the Figure23.

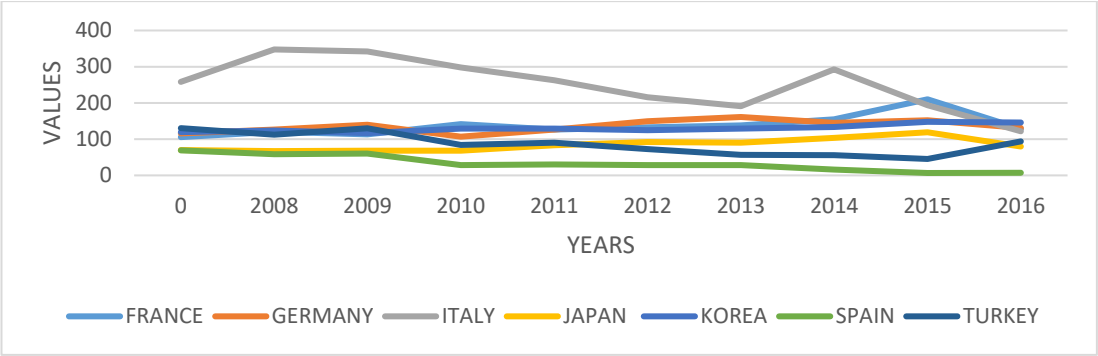

Figure 23: Trend analysis of gearing ratio

In conclusion**,** Turkey has rising general trend for majority of financial ratios. In contrast, Italy has extremely fluctuating and decreasing trend. European countries; France, Germany, and Spain have similar trend. On the other hand, Japan and Korea are completely independent as Far East countries.

Chapter 6

CONCLUSION AND IMPLICATIONS

In this study, financial ratios of automotive industry companies have been compared among seven different countries. These countries were France, Germany, Italy, Japan, Korea, Spain and Turkey. The main aim was to identify significant differences among the automotive industries of each country. Main aim of the study is to help

managers in decision making, create awareness for investors, creditors and financial information users.

In the process of analysing the data for 278 companies, three different tests have been used. Those were; descriptive statistics, ANOVA test and trend analysis.
According to descriptive statistics results, Turkey has highest profitability in automotive sector. This result represents great investment opportunity for financial investors. In contrast, Italy has highest gearing ratio which is the representative of high debt ratio. High debt ratio is a risk for company's financial strength as well as for creditors and investors.

ANOVA analysis was the second test in the study. Test is used to determine differences among the seven countries for each of the financial ratios. Differences are understood by the significance level of variable comparison. Values under 5% are categorised as significant. In contrast, values higher than 5% significance level are categorised as insignificant. Significant values represents difference existing among the compared variables. In opposite, insignificant values are symbol for lack of difference.

ANOVA test results are showing that, automotive industry in Turkey is suitable for investments. Detailed explanation behind this result is the highest average ratio of ROA, current ratio and solvency values. These three ratios are important factors to run a business in the long run.

Italian automotive industry has higher gross profit margin average but this advantage is not sufficient to cover the financial risk ratio taken by the companies. Italy has the highest gearing ratio average, and this rate of financial risk should be reduced by managers and also governmental regulations should be re-organized for better financial structure. Spain has balance market according to descriptive statistics. That is to say; Spanish automotive industry would be a perfect reference for Italian sector.

Trend analysis was the third and last analysis covered in this thesis. According to trend analysis measurements, Italy has extremely decreasing fluctuations over the financial ratios in the nine year period. These critical changes would be an important factor for investors to think twice about investing into Italian automotive industry.
Turkey has fluctuations in trend but in general, it has increasing ratio averages. This positively rising general trend would be an attractive opportunity for investors.
Far East countries has highest number of automotive companies rival in country but this is not a factor leading the profitability and balance in market structure. Japan and Korea governments would try to regulate market structure in order to enrich the country economy.

In conclusion, it can be stated that there is an extreme financial fluctuations in Italian automotive industry. In contrast, Turkey has an increasing and more stable trend. Germany, France and Spain have similar trends as European countries. Far East countries; Korea and Japan have completely independent ratios.

According to the above results; Italian managers should control the management structure and business model of companies. Besides this, the Italian government

should consider the regulatory factors and tax effects on financial fluctuations of companies.

Turkish automotive industry would be a perfect option for investors. In addition, balance trend of Germany, France and Spain would be indicated as reference for governmental regulations to other countries.

REFERENCES

B. Bulgurcu, 2013, Financial Performance Ranking of the Automotive Industry Firms in Turkey: Evidence from an Entropy-Weighted Technique, International Journal of Economics and Financial Issues Vol. 3, No. 4, 2013, pp.844-851

C.M.Liu, G. O'Farrell , K. Wei, L.J. Yao , 2013, Ratio analysis comparability between Chinese and Japanese firms, Journal of Asia Business Studies, Vol. 7 Issue: 2, pp.185-199, Emerald 2013 publishment

C. Mugan, N.Akman, 2010, Principles of financial accounting, 4th edition, page:627-651), Turkey

C. Walsh, 1993, Key management ratios, pages: 13-192, Pitman publishment, London

D. Bao, J. Lee, G. Romeo, (2010) "Comparisons on selected ratios between IFRS and US GAAP companies", Journal of Financial Reporting and Accounting, Vol. 8 Issue: 1, pp.33-34

D. Delen, C. Kuzey, A. Uyar, 2013, measuring firm performance using financial ratios: A decision tree approach, Expert Systems with Applications 40 (2013) 3970–3983, Elsevier 2013

D. Groebner, P. W. Shannon, P.C. Fry, K.D. Smith, 2011, Business statistics: decision Making Approach, 8th edition, pages: 54-100, Pearson

D. Kim (2006) a Comparative Study of Financial Ratios between Hotels and Restaurants, International Journal of Tourism Sciences, 6:1, 95-106,

E. Brigham, J. Houston, 2017, fundamentals of financial management, 9th edition, page: 113, Cengage learning 2015, Boston - USA

E. Kim, A.M. Fiore, and H. Kim, 2011, Fashion Trends analysis and forecasting, Blumsbury publishing, London

G. Szucs, 2015, The Financial analysis of the Hungarian automotive industry based on profitability and capital structure ratios, Central European business review, Volume 4, No:1

H. Borhan, R. Mohamed, N. Azmi, (2014) "The impact of financial ratios on the financial performance of a chemical company: The case of LyondellBasell Industries", World Journal of Entrepreneurship, Management and Sustainable Development, Vol. 10 Issue: 3, pp.154-160,

H.F. Ali, A. Charbaji, (1994), Applying Factor analysis to financial ratios of International Commercial Airlines, International Journal of Commerce and Management, Vol. 4 Issue: 1/3, pp.35-37,

I. Khan, M. Khan**,** M. Tahir**,** Performance comparison of Islamic and conventional banks: empirical evidence from Pakistan, Emerald Publishing ltd.

J. Arnold, T. Hope, A. Southworth, 1944, Financial Accounting, pages: 335-347, Prentice Hall 1985

J.R. Williams, S. Haka, M. Bettner, J. Carcello, N. Lam, P. Lau, 2011,Financial accounting: including International financial reporting standards, 11th edition, Mc Graw Hill publishment, Singapore

J.R. Williams, S. Haka, M. Bettner, J. Carcello, 2012, Financial Accounting, 15th edition, pages: 625-646,Mc Graw Hill Publishment, United states

J.C. Drury, (1981) "A Study of Industry Financial Ratios", Management Decision, Vol. 19 Issue: 1, pp.34-35,

J. Wahlen, S.Baginski, M.Bradshaw, 2018, Financial reporting, financial statement analysis and valuation, 9th edition, page: 234, Cengage learning, USA

J. Samuels, R.Brayshaw, J.Craner, 1995, Financial statement analysis in Europe, 1st edition, pages: 8-25, chapman & hall publishment, England

J. Pallant, 2005, SPSS Survival Manual, version 12, Allen & Unwin 83 alexander street, National library of Australia, Sydney

M. Mesaric, 2014, Ratio analysis and Piotrosky scoring system in the automobile industry in Croatia, Preliminary communication, paper: 497.5

M. Powers, B. Needles, 2013, Financial Accounting, 11th edition, Pages:47-75, 214-261, 2010 South-Western, Cengage Learning

M. Omran, A. Ragab, (2004) "Linear Versus Non-linear Relationships between Financial Ratios and Stock Returns: Empirical Evidence from Egyptian Firms", Review of Accounting and Finance, Vol. 3 Issue: 3, pp.84-103,

O. Heneric, G. Licht, W. Sofka, 2005, Europe's Automotive Industry on the Move, Springer business media, Germany

P. Tan, H. Koh, L.C. Low, (1997) "Stability of Financial Ratios: A Study of Listed Companies in Singapore", Asian Review of Accounting, Vol. 5 Issue: 1, pp.19-39,

P. Taylor and B. Underdown, 1992, Financial accounting, 2nd edition, pages:317-340, London

R.Kajananthan, 2014, Liquidity, Solvency and Profitability Analysis Using Cash Flow Ratios and Traditional Ratios: The Telecommunication Sector in Sri Lanka, Research Journal of Finance and Accounting,

World Trade Organization, Statistical tables, 2016, Table 21, https://www.wto.org/english/res_e/statis_e/tradebysector_e.htm