

# Overall analysis of vehicle sales in Romania through the intermediary of SPSS application

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**Abstract:** *The purpose of the research consisted in an overall analysis of vehicle sales, by makes and categories. To this aim, with the help of SPSS application, there have been calculated a series of indicators, such as: the mean and the way, the percentage frequencies, Pearson's correlation coefficients. Following this research we may draw the following conclusions: the effectiveness of fuel consumption is placed on the first position in the decision to buy a vehicle (aspect anticipated by KPMG since 2004); the sales of hybrid and electric vehicles will increase in percentage, but will still remain small as volume, if the governments of the countries will not intervene by granting subsidies; the BIRC countries will play a "big part" in this industry in the following years; the category "Cars" holds the 1<sup>st</sup> place both in sales, and at the mean on makes; there are a lot of makes in Romania that did not sell any unit in 2010 and in the first four months in 2011; There is a perfect correlation between the sales of cars and the sales of LCV+Minibus. This research may be developed in the following directions: correlation of the results obtained following the analysis of the vehicle sales in Romania with those within the EU, with a view to identify the relations that exist between the two levels of sales; identification of a possible connection between Romania and the BIRC countries in the future, connections that could cause positive effects in the Romanian automotive industry.*

## Introduction

Against the background of the economical-financial depression, the vehicle sales in Romania have registered decreases and also during the period 2010-2011. Starting from this almost known finding, the purpose of the research consisted in an overall analysis of vehicle sales, by makes and categories. To this aim, with the help of SPSS application, there have been calculated a series of indicators, such as: the mean and the way, the percentage frequencies, Pearson's correlation coefficients.

In order to correctly interpret these indicators, the research comprised also the radiography of the automotive industry in Romania, as well as a review of the principal directions in the worldwide automotive industry (whose intrinsic part is also the related industry in Romania).

This research may be developed in the following directions:

- Correlation of the results obtained following the analysis of the vehicle sales in Romania with those within the EU, with a view to identify the relations that exist between the two levels of sales.
- Identification of a possible connection between Romania and the BIRC countries in the future, connections that could cause positive effects in the Romanian automotive industry.

## II. The main directions in the worldwide automotive industry

Since 2004, KPMG has anticipated that the effectiveness of consumption of fuel will increase as preponderance in the buying criteria. In 2011, the fuel consumption is the primary concern of consumers. But this is not the only element that influences the decision to buy, fact which can be seen in the table below.

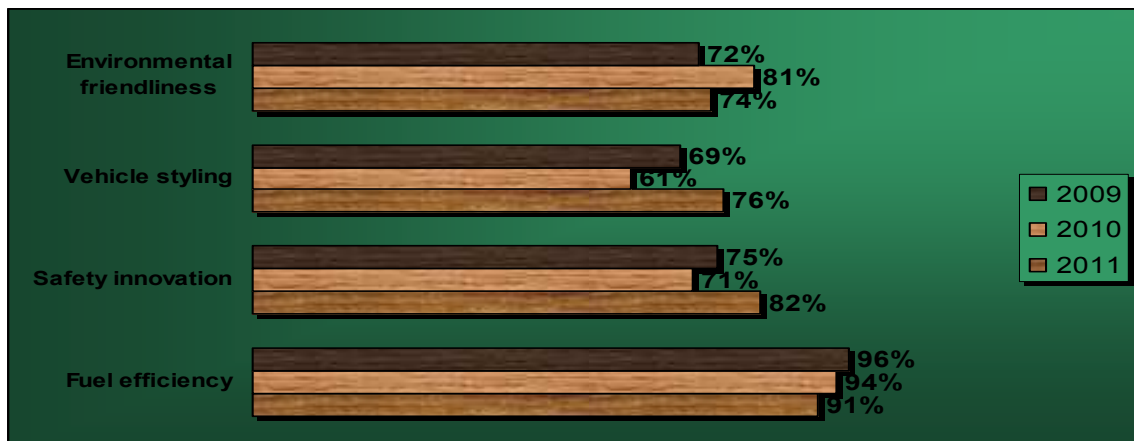
**Table.1: The importance attached by consumers to the characteristics of vehicles 2011**

Characteristics	Importance
Fuel efficiency	91%
Safety innovation	82%
Vehicle styling	76%
Environmental friendliness	74%
Ergonomics and comfort	70%
Built-in navigation technologies, speech recognition	57%
Telematics/personal assistance services	56%
Use alternative fuel technologies	55%
Enhanced vehicle lifespan	40%

Adapted by KPMG’s Global Automotive Executive Survey 2011

As it has been foreseen, the consumers in 2011 are, first of all, interested in the effectiveness of fuel consumption and only then in safety, design and how much does the vehicle pollute the environment.

These preferences had, during the period 2009-2011, the following evolution:



**Graph 1: The consumers' interests**

Out of the above mentioned table it can be noticed the fact that the interest in the design has increased from 69% in 2009, respectively 61% in 2010 to 76% in 2011, for safety from 75% in 2009 and 71% in 2010 to 82% in 2011, and for the effectiveness of consumption, even if has considerably increased, still is placed on the first position with 91%.

The manufacturers in the automotive industry have to analyse the new requests relating to their product. Future vehicle design will be influenced by these elements: urban planning, environmental restrictions, customer needs.

A survey carried out by KPMG (KPMG's Global Automotive Executive Survey 2011) showed the fact that 76% of the respondents consider that urban planning will influence in the future the contraction of vehicles. Interestingly, in China, a number of cities, such as Shanghai, restrict the number of car licenses at different times to avoid congestion and pollution.

Despite this things, mobility solutions do not appear to be a central part of most companies' strategies. Only 9 percent believe the concept to be extremely important. Fortunately, not everyone shares such a view. Some organizations have already started exploring mobility service offerings, such as Daimler with its urban car-sharing service 'car2go', and 'Mu' by Peugeot. Also Renault-Nissan is focusing on new business opportunities through an electric vehicle car-sharing collaboration with Project Better Place.

Even if the sales of hybrid and electric vehicles have big percentage increases, the volume of sales is unfortunately maintained at a decreased level. KPMG has carried out a poll (a new vehicle's logbook in the automotive industry) abreast of the executive staff in the automotive industry, in which participated over 200 automotive manufacturers, suppliers and dealers in the field. Approximately 80% of the respondents said that hybrid and electric vehicles will have the lion's share in developing any other categories of vehicles in the following 5 years. Notwithstanding, many respondents have expectations that governments continuously play an important role, considering that electric vehicles will not become soon accessible in default of some subsidies.

For the year 2011, we expect the following increases the categories of vehicles:

**Table.2: Predictions for the increase of sales in 2011**

Categories of vehicles	Increases in 2011
Hybrid fuel vehicles	84%
Electric vehicles	77%
Cars	69%
Other alternative fuel vehicles	63%
Basic or introduction cars	60%
Cross-overs	56%
SUVs	51%
Luxury vehicles	46%
Small pick-up trucks	45%
Minivans	41%
Large pick-up trucks	27%

The fourth public report of CNI, named **Global Trends 2025: A Transformed World**, carries out a series of predictions for the following years. The main conclusion of the report is that the United States will lose their supremacy not as a consequence of its decline, but as a consequence that states as India and China will rapidly become known in the following years. The report comprises a series of predictions of increase for BIRC countries (Brazil, Russia, India and China) as it follows (**Global Trends 2025: A Transformed World**):

- **China** is poised to have more impact on the world over the next 20 years than any other country. If current trends persist, by 2025 China will have the world's second largest economy and will be a leading military power. It also could be the largest importer of natural resources and the biggest polluter.

- **India** probably will continue to enjoy relatively rapid economic growth and will strive for a multipolar world in which New Delhi is one of the poles. China and India must decide the extent to which they are willing and capable of playing increasing global roles and how each will relate to the other.

- **Russia** has the potential to be richer, more powerful, and more self-assured in 2025 if it invests in human capital, expands and diversifies its economy, and integrates with global markets. On the other hand, Russia could experience a significant decline if it fails to take these steps and oil and gas prices remain in the \$50-70 per barrel range.

What roles have these countries in the automotive industry? KPMG's Global Automotive Executive Survey 2011 presents the predictions relating to each of these countries as it follows:

- **China** will remain the largest producer and seller of cars in five years. It is expecting that domestic sales in China to exceed 18 million in the next five years.

- **India** începe să genereze un mare interes pentru investitori. Firmele din America par cele mai interesate. According to the Society of Indian Automobile Manufacturers India exported 0,45 million and sold 1.95 million vehicles in the domestic market in 2009. Industry experts expect domestic sales to reach 3.5 million by 2015, a growth rate of 13% per year.

- **Brazil.** Few industry experts believe that Brazil will become a major exporter of cars in the next few years, or indeed manufacture over a million vehicles in other markets in that time frame.

- **Russia.** The Russian government has done much to encourage inward investment and bolster in-country car production, to create jobs and transfer manufacturing skills, as well as automotive technology, to the local market. Some European companies have already begun producing in Russia, Germany's Volkswagen has built car production facility in the city of Kaluga, while the French car maker Renault has bought a 25 percent stake in AVTOVAZ. Tagaz has teamed up with Hyundai and Kia, BMW and GM with Avtotor. In fact, of the 19 Russian OEMs, 17 represent or have joint ventures with international automakers.

From 2007 to 2015, emerging markets are expected to represent 18 times the estimated growth in light vehicle assembly as mature markets in the same period. PwC forecasts that 95 percent of light vehicle growth

will originate from emerging markets. Among these markets, the BRIC (Brazil, Russia, India and China) countries are most eminent in the growth stakes, with more than 58 percent of forecasted growth from 2007 to 2015 stemming from them. (Isac N., Băgu C. 2010, p.208)

Emerging markets are anticipated to grow by 26 million units during this time period, while mature market assembly growth will be relatively flat at only 1.4 million units. This trend has lead automakers and suppliers to grow in emerging markets and consolidate operations in mature markets. This trend presents significant opportunities for automakers and suppliers that are positioned to benefit from the growing emerging markets.

(<http://www.pwc.com/gx/en/automotive/issues-trends/industry-globalisation.jhtml>)

### III. The automotive industry in Romania - part of the worldwide automotive industry

#### a. The status of the automotive industry in the year 2011

Bill Bowman, Deputy Senior Partner la KPMG in Romania said the following things: "In a turbulent economic environment and with an insecure future, the automotive market in Romania took advantages of the opportunities to distinguish among the 27 countries of the European Union\*". At the European level, Dacia manufacturer from Romania has become one of the top players seen from the sales perspective in January 2011, with an increase of 19% as compared to the same month of the last year. Dacia is on the third position, preceded only by the Japanese manufacturer Mitsubishi with an increase of 43% and by Alfa Romeo in Italy with an increase of sales of 39% as compared to the month of January of the year 2010. These results confirm the positioning of the Romanian manufacturer among the automotive manufacturers with the most rapid development on the market of the EU. (<http://businesscover.ro/studiu-kpmg-o-noua-foaie-de-parcurs-pentru-industria-auto/>)

Out of the data of the Association of Manufacturers and Importers of Vehicles (APIA), the most sold vehicle during the period January - April 2011 is Skoda Octavia. The sales for this model have increased in the first four months by 20,5% as compared to the same period in the last year, to 1.124 units.

On the second place in the top of sales was Volkswagen Golf, with 957 vehicles sold in the first four months, with an **increase** of 29,1% as compared to the period January - April

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\* The European Union is a community of European independent states - gathered today around the values of political, economic, cultural and social interests. The European Union functions as an intermediary who negotiate for reducing the tensions generated by splitting resulted during the globalization phenomenon within the EU among the national states being while one of the most important factors in the multilateral commercial negotiations and one of the supporters of the International Trade Organization. (Oancea, Pandelică, Brânzea, 2009, p.104)

2011. The podium is completed by the French from Renault with the model Clio, which registered sales of 734 units, increasing by 34,6% on the whole in the first 4 months. The sales for this model have recovered strongly in April, marking a spectacular increase of 152%, to 384 units.

0 Another statistic published by APIA shows that the most sold makes of import vehicles in Romania, in the first four months, were Volkswagen (2694 units), Skoda (2167), Renault (1600), Ford (1356), Opel (1202), Hyundai (814), Peugeot (734), Chevrolet (719), Toyota (693) and Suzuki (623 units). (<http://www.dailybusiness.ro/stiri-auto/top-10-cele-mai-vandute-automobile-in-romania-in-2011-62682/>)

On the whole of the market, Dacia remained market leader in the first four months, with 6.912 sold vehicles, the manufacturer being followed by Volkswagen and Skoda.

#### b. The analysis of the sales of vehicles in Romania with the help of SPSS application

The selling is an interpersonal activity that completes the exchange of marketing in terms of transfer of the property over the goods or services (Hill E. & O'Sullivan T., 1997, p. 243.). The selling is the representative of all the other marketing actions; without a client there exist no organization, and without selling there is no client. To sell does not mean only to conclude a deal (I offer economic goods and for exchange I receive an amount), but to obtain satisfied clients, to make them constant etc. This means passing from a transactional attitude to a relational one. (Brutu M., 2009, p. 12)

For an overall analysis of the sales of vehicles in Romania have been calculated a series of statistical indicators using the SPSS application.

In the first phase has been calculated the mean and the way for different categories of vehicles delivered in the year 2010 and in the first 4 months of the year 2011.

The results obtained are presented as follows:

**Table.3: The mean and the way for deliveries of vehicles by categories**

2010								
Cars			LCV+Minibus			Com.>3,5t+Bus		
N	Valid	64	N	Valid	64	N	Valid	64
	Missing	0		Missing	0		Missing	0
	Mean	1661,38		Mean	154,70		Mean	49,81
	Mode	0		Mode	0		Mode	0

2011*								
Cars			LCV+Minibus			Com.>3,5t+Bus		
N	Valid	61	N	Valid	61	N	Valid	61
	Missing	0		Missing	0		Missing	0
	Mean	380,52		Mean	55,74		Mean	9,89
	Mode	0		Mode	0		Mode	0

A first remark refers to the fact that in 2010 there were 64 makes that traded vehicles on the Romanian market, and in 2011 their number was reduced to 61.

The second remark refers to the fact the vehicles have the first place as mean of trade, by makes (1661,38 in 2010 and 380,52 in the first months in 2011), LCVs and minibuses have the second place (154,70 in 2010 and 49,81 in the first four months in 2011), and the vehicles over 3,5 tons and buses have the last position (49,81 in 2010 and 9,89 in the first four months in 2011).

The main remark consists in the fact that in both analysed years and for each category of vehicle the way (meaning the greatest frequent value) is 0. It means there was a series of makes which have not sold one single vehicle.

Being incited by this finding we wanted to see what is the number of makes which have not sold even one vehicle and for this we have passed to the second part of the analysis and we have calculated with the help of SPSS application too the percentage frequencies. The results obtained are presented in the table bellow.

**Table.4: Percentage frequencies of 0 sales of vehicles, by categories**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>2010</b>					
<b>Cars</b>					
Valid	0	23	35,9	35,9	35,9
	Total	64	100,0	100,0	
<b>LCV+Minibus</b>					
Valid	0	44	68,8	68,8	68,8
	Total	64	100,0	100,0	
<b>Com.&gt;3,5t+Bus</b>					
Valid	0	49	76,6	76,6	76,6
	Total	64	100,0	100,0	

\* January - April

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>2011</b>				
<b>Cars</b>				
Valid	0	25	41,0	41,0
Total	61	100,0	100,0	
<b>LCV+Minibus</b>				
Valid	0	44	72,1	72,1
Total	61	100,0	100,0	
<b>Com.&gt;3,5t+Bus</b>				
Valid	0	50	82,0	82,0
Total	61	100,0	100,0	

Following to this analysis we may depict the following remarks:

- For the category „cars” in the year 2010 existed 23 makes which sold no unit, which represent a percentage of 35,9% of the total of vehicle makes (64 in this year). In the first 4 months of the year 2011 we notice a percentage of 25 makes that sold no vehicle within this category, meaning 41% of the total of makes (61 in 2011).
- For the category „LCV+Minibus” both for 2010 and for the first four months in 2011 existed 44 companies which have not traded such vehicles, equivalent to the percentage of 68,8% in 2010 and 72,1% for 2011.
- For the category „Com.>3,5t+Bus”, in 2010 49 makes did not trade vehicles, meaning 76,6%, and in 2011 50 makes, meaning 82,2%.

These results certify again, that the economical - financial depression touched this field of activity too all over the world, as well as in Romania.

In the last phase has been analyzed the reaction between two variables with the help of Pearson's correlation coefficient. The correlation coefficient is a numeric measure or an index of the degree of association between two sets of scores. The interval of values is of maximum +1,00, through 0,00, to -1,00. The sign + indicates a positive correlation, namely that the scores of a variable increase at the same time with the scores of the other variable. The sign - indicates a negative correlation, namely that, while the scores of a variable increase, the scores for the other variable decrease. A correlation 1,00 indicates a perfect association between the two variables.



**Table.5: Pearson's correlation coefficients**

2010				2011			
Correlations				Correlations			
		Cars	LCV+ Minibus			Cars	LCV+ Minibus
Cars	Pearson Correlation	1	,790**	Cars	Pearson Correlation	1	,830**
	Sig. (2-tailed)		,000		Sig. (2-tailed)		,000
	N	64	64		N	61	61
LCV+ Minibus	Pearson Correlation	,790**	1	LCV+ Minibus	Pearson Correlation	,830**	1
	Sig. (2-tailed)	,000			Sig. (2-tailed)	,000	
	N	64	64		N	61	61
**. Correlation is significant at the 0.01 level (2-tailed).				**. Correlation is significant at the 0.01 level (2-tailed).			
Correlations				Correlations			
		Cars	Com.>3,5t +Bus			Cars	Com.>3,5t +Bus
Cars	Pearson Correlation	1	-,082	Cars	Pearson Correlation	1	-,050
	Sig. (2-tailed)		,520		Sig. (2-tailed)		,704
	N	64	64		N	61	61
Com.>3,5t +Bus	Pearson Correlation	-,082	1	Com.>3,5t +Bus	Pearson Correlation	-,050	1
	Sig. (2-tailed)	,520			Sig. (2-tailed)	,704	
	N	64	64		N	61	61
Correlations				Correlations			
		LCV+ Minibus	Com.>3,5t+ Bus			Com.>3,5t+ Bus	LCV+ Minibus
LCV+ Minibus	Pearson Correlation	1	,251*	Com.>3,5t +Bus	Pearson Correlation	1	,033
	Sig. (2-tailed)		,046		Sig. (2-tailed)		,802
	N	64	64		N	61	61
Com.>3,5t +Bus	Pearson Correlation	,251*	1	LCV+ Minibus	Pearson Correlation	,033	1
	Sig. (2-tailed)	,046			Sig. (2-tailed)	,802	
	N	64	64		N	61	61
*. Correlation is significant at the 0.05 level (2-tailed).							

From the above table there may be detached the following aspects:

a. there exists a significant positive correlation between the sales of cars and the sales of LCV+Minibus. It means that the companies that register big sales of cars sell also a lot of LCV+Minibuses:

- for the year 2010:  $r = 0,79$ ;  $DF=62$ ,  $p<0,001$ , where  $r$ -correlation,  $DF$ -degrees of liberty equal to the number of cases minus 2,  $p$ -level of significance, which here is 0,000, lower than 0,001, but in order not to confuse the readers there is reported 0,001 (at a level of significance of 0,001 or lower, the correlation is statistically significant)

- for the year 2011:  $r = 0,83$ ;  $DF=59$ ,  $p<0,001$

b. between the sales of cars and the sales of Com.>3,5t+Buses exists a negative correlation, but insignificant. This means that the companies which register big sales of cars, register small sales of Com.>3,5t+Buses:

- for the year 2010:  $r = - 0,08$ ;  $DF=62$ ,  $p>0,001$

- for the year 2011:  $r = - 0,05$ ;  $DF=59$ ,  $p>0,001$

c. between the sales of LCV+Minibus and Com.>3,5t+Bus-uri exist a positive correlation, but insignificant:

- for the year 2010:  $r = 0,25$ ;  $DF=62$ ,  $p>0,001$

- for the year 2011:  $r = 0,03$ ;  $DF=59$ ,  $p>0,001$

Thus, the leader makes for category "Cars" sell also a considerable number of "LCV+Minibus", but they sell less "Com.>3,5t+Bus" or do not sell any unit of this vehicles.

#### IV. Conclusions

Following this research we may draw the following conclusions:

- the effectiveness of fuel consumption is placed on the first position in the decision to buy a vehicle (aspect anticipated by KPMG since 2004)
- the sales of hybrid and electric vehicles will increase in percentage, but will still remain small as volume, if the governments of the countries will not intervene by granting subsidies;
- the BIRC countries will play a "big part" in this industry in the following years;
- the category "Cars" holds the 1<sup>st</sup> place both in sales, and at the mean on makes;
- there are a lot of makes in Romania that did not sell any unit in 2010 and in the first four months in 2011.
- There is a perfect correlation between the sales of cars and the sales of LCV+Minibus.

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[www.kpmg.com](http://www.kpmg.com)

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