# The Correlation between Entrepreneurship and the Macroeconomic Indicators in Romania

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ABSTRACT

Entrepreneurship as an indispensable lever in the process of ensuring the growth and development of sustainable economics represents focus point of the politics, programs and national, regional and global strategies. if the positive impact of the entrepreneurial activities over the macroeconomic results and over the social structures by accessing new markets, by increasing employment rate, alleviate poverty, enhancing productivity and innovation and thus economic growth it is generally accepted and widely promoted, the reverse approach shouldn't be neglected either. Therefore, the aim of this study consists in highlighting the influence the level of economic competitiveness, the employment rate and the GDP/capita have on the evolution of entrepreneurship in Romania's economy, as also in shaping , based on identified tendencies, of additional levers for implementing efficiently the entrepreneurial national and European strategies.

**Introduction**

In the globalization context, entrepreneurship, through its substantial contribution to the general human progress, due to the positive changes it generates, considering the macroeconomic results it generates and also of the social structures, national institutions and population behaviour, is of interest not only in national economies, but also in the European union and even at a global level. Proofs are the strategies and the national and regional policies, but also the numerous reports regarding the evolution of entrepreneurship internationally.

Therefore, the European Union adopted in 2008 the initiative "Small Business Act" which aims at developing the entrepreneurial spirit and therefore of entrepreneurial initiatives at a European level, especially through SME. The initiative is carried on in 2010 by adopting the Europe Strategy 2020 having as main objective facilitating access to a unique market, especially for small entrepreneurs. The organizational framework for synchronizing economic and financial policies of the member states and for monitoring the level of implementation of the strategies provided by the Europe Strategy 2020 is ensured by the "European Semester".

Romania, as part of this international picture, in order to cope with the demands imposed for integration on external markets, must ensure the premises for a sustainable competitiveness, that generate sustainable prosperity, especially since the path the world economy has chosen

is irreversible, the global economic system being one based on interdependency, cooperation and multilateralism.

Considering this aspect, the purpose of this research paper is to analyse based on empirical data of the quantitative and qualitative correlation between the entrepreneurship rate and three relevant macroeconomic indicators ( economic competitiveness, GDP/capita, employment rate), and also identifying, based on the results obtained, supplementary levers for implementing efficiently the entrepreneurial strategies in Romania.

But, the analysis will not focus only on highlighting the positive externalities determined by the entrepreneurial activities, but will focus on promoting the influence the three macroeconomic indicators exert on the dynamic of entrepreneurial activities.

In order to establish the existence of a link and to determine the strength and the sense of this correlation the Data Analysis function is used within the Excel spread sheet.  The inter-conditional correlation is illustrated using diagrams scatterplot, created by using Microsoft Office Excel 2010.

The analysis based on empirical data was performed considering the following technical aspects:

- entrepreneurship is analysed considering the total entrepreneurial rate (ER) computes as a sum between the early stage entrepreneurial rate and the consecrated entrepreneurial rate.

- in order to ensure comparability, the Global Competitiveness Index is also, expressed as a percentage, as a share of the index for each analysed country, with a maximum score (7 points).

- the time frame under analysis is 2007-2015 because Romania was included in the study regarding entrepreneurship monitoring 2007.

## 2. The correlation entrepreneurship- economic competitiveness analysis

With regard to the fact that Romania was included in the study concerning entrepreneurial monitoring at a global level (Global Entrepreneurship Monitor) in 2007, as it can be seen in table no.1, the analysis of the correlation between the evolution of the entrepreneurship total rate and the global competitiveness index will take into consideration the data available for 2007-2015.

**Table 1:** Global Competitiveness Index and the Entrepreneurship Rate in Romania

| Indicators | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| GCI (%) | 56,71 | 58,57 | 58,71 | 59,43 | 58,29 | 58,14 | 59 | 61,43 | 61,71 |
| ER (%) | 6,5 | 6,1 | 8,4 | 6,4 | 14,5 | 13 | 15,4 | 18,9 | 18,3 |

**Source:** Personal data processing based on the data available in the "Global Entrepreneurship Monitor" Annual Reports 2008 -2015 and "The Global Competitiveness Report" Annual Reports 2008 -2015

The evolution of the two variables in Romania, during the concerned period, shows a positive linear correlation, strong (r=0.68). Thus, the data submitted in table no.2 show that the evolution of the average entrepreneurship rate is influenced of 46.8% by the evolution of the Global Competitiveness Index. The validity of the obtained correlation is supported by the positive value of the test F (6.17) and also by the value lower than 0.5 of the materiality limit.

**Table 2:** Results table using the regression method concerning the correlation strength between the Global Competitiveness Index and the Entrepreneurship Rate in Romania

*Regression Statistics*

| | |
|---|---|
| Multiple R | 0,684535 |
| R Square | 0,468588 |
| Adjusted R Square | 0,392672 |
| Standard Error | 1,234718 |

| | df | SS | MS | F | Significance F |
|---|---|---|---|---|---|
| Regression | 1 | 9,410099 | 9,410099 | 6,172464 | 0,041936 |
| Residual | 7 | 10,6717 | 1,524529 | | |
| Total | 8 | 20,0818 | | | |

Observations 9

ANOVA

**Source:** personal data processing using Excel

The linear and positive correlation between the relative changes of the entrepreneurship total rate and the Global Competitiveness Index for de Romanian Econcomy is submitted in Figure 1
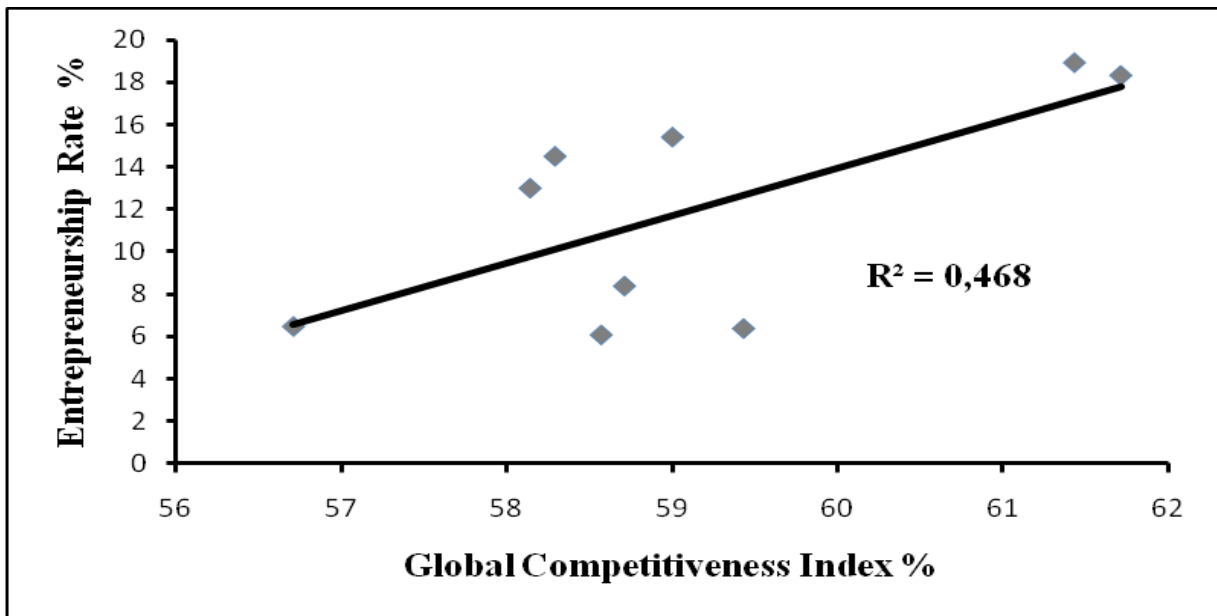


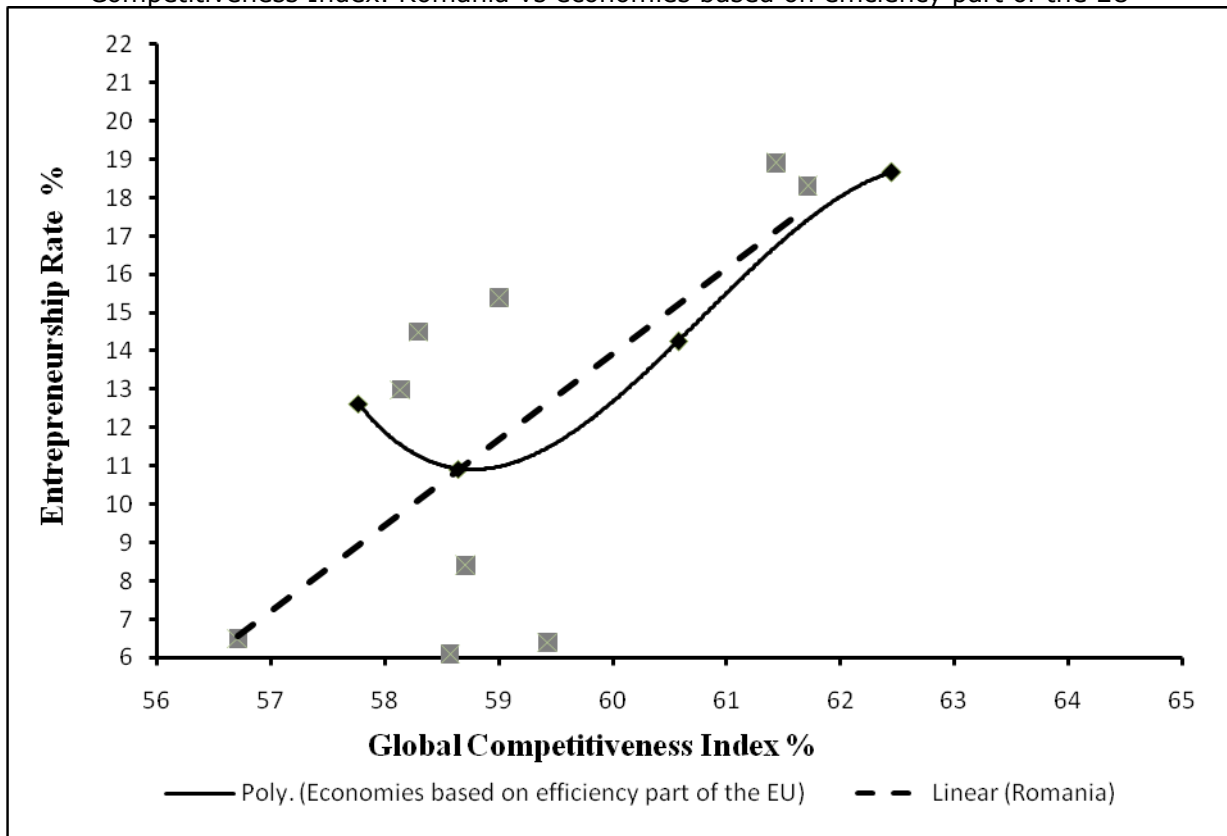**Source:** personal data processing based on the data provided in Table 1

**Figure 1:** The corelation diagram between the Entrepreneurship Rate and the Global Competitiveness Index in Romania

The comparative illustration in diagram no.2 of the total entrepreneurship trend with regards to the Global Competitiveness Index in Romania and of the determinant for the EU member states with economies based on efficiency (our country falling also into this category) reflects the following aspects:
- within the competitiveness interval 57.75-58.65 the entrepreneurial level increases in Romania, unlike the downward trend recorded for the EU member states with economies based on efficiency. The process can be explained by the low share of entrepreneurial activities recorded within our country, compared to the minimum level determined by the trend of the group.
- the upward trend of the entrepreneurial process is preserved but when the global competitiveness level will reach values higher than 62.5 emerges the risk that the entrepreneurial process shall enter a regressive phase according to the analyzed group trend- a particularly important aspect in formulating and implementing support and encouragement strategies of the business environment, especially the entrepreneurial environment.

We can therefore conclude that the empirical data of the Romanian economy also confirms the inter-conditional correlation of the two socio-economic variables, the ascending linear trend suggesting that the entrepreneurial process in our country hasn't reach maturity just yet, being still in full process of developing a favorable and exciting entrepreneurial ecosystem. For this reason, the evolution of the entrepreneurial activities is influenced directly, in a high proportion by the institutional domestic context, economic, social and politic, aspects synthetized through the Global Competitiveness Index.

**Diagram 2:** The correlation between the Entrepreneurship Rate and the Global Competitiveness Index. Romania vs economies based on efficiency part of the EU

Considering all of these aspects it appears that if the theoretical approaches focus primarily on the entrepreneurship role in ensuring growth and sustainable development of national economies (especially by generating new jobs and by boosting macroeconomic results) reality led to shaping a complementary perspective- the evolution of the entrepreneurial process is influenced in turn by national competitiveness. Under these circumstances crystalizes the idea of reverse analysis also in terms of the correlation between the entrepreneurship total rate and the employment rate, respectively GDP/capita.

## 3. The correlation entrepreneurship- employment rate analysis

Further on shall be computed the influence of the employment rate over the evolution of the total entrepreneurship rate. The inter-conditional relationship shall be then illustrated using the scatterplot diagrams, created with Microsoft Office Excel 2010.

**Table 3:** Employment Rate and the Entrepreneurship Rate in Romania

| Indicators | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| Entrepreneurship Rate (%) | 6,5 | 6,1 | 8,4 | 6,4 | 14,5 | 13 | 15,4 | 18,9 | 18,3 |
| Employment Rate (%)[1] | 58,8 | 59 | 58,6 | 60,2 | 59,3 | 60,2 | 60,1 | 61 | 61,4 |

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[1] Employment rate relates to age group between 15 and 64 years

The results of data processing submitted in Table no. 3, using the Data Analysis function within the Excel Software with the purpose of determining the strength of the correlation between the Global Competitiveness Index and the employment rate in Romania is presented in table no.4.

**Table 4:** Table of results using the regression method regarding the strength of the correlation between the Global Competitiveness Index and the Employment Rate in Romania

| Regression Statistics | | | | | |
|---|---|---|---|---|---|
| Multiple R | 0,756362 | | | | |
| R Square | 0,572084 | | | | |
| Adjusted R Square | 0,510953 | | | | |
| Standard Error | 3,629243 | | | | |
| Observations | 9 | | | | |

| ANOVA | | | | | |
|---|---|---|---|---|---|
| | df | SS | MS | F | Significance F |
| Regression | 1 | 123,2624 | 123,2624 | 9,358334 | 0,018346 |
| Residual | 7 | 92,19983 | 13,1714 | | |
| Total | 8 | 215,4622 | | | |

**Source:** personal data processing using Excel

The value higher than 0.7 of the linear correlation coefficient "r" reflects a positive and linear correlation, very strong (r=0.75). Thus, the data submitted in table no. 4 shows that the evolution of the average entrepreneurial rate is positively influenced, with 57.2% by the evolution of the employment rate, aspect illustrated also graphically in Diagram no. 3. The validity of the correlation obtained is also supported by the positive value of the test F (9.35) as well as by the value lower than 0.05 of the materiality threshold (0.01)

**Diagram 3:** The diagram of the correlation between the entrepreneursip total rate and the employmentrateinRomania



$R^2 = 0,572$
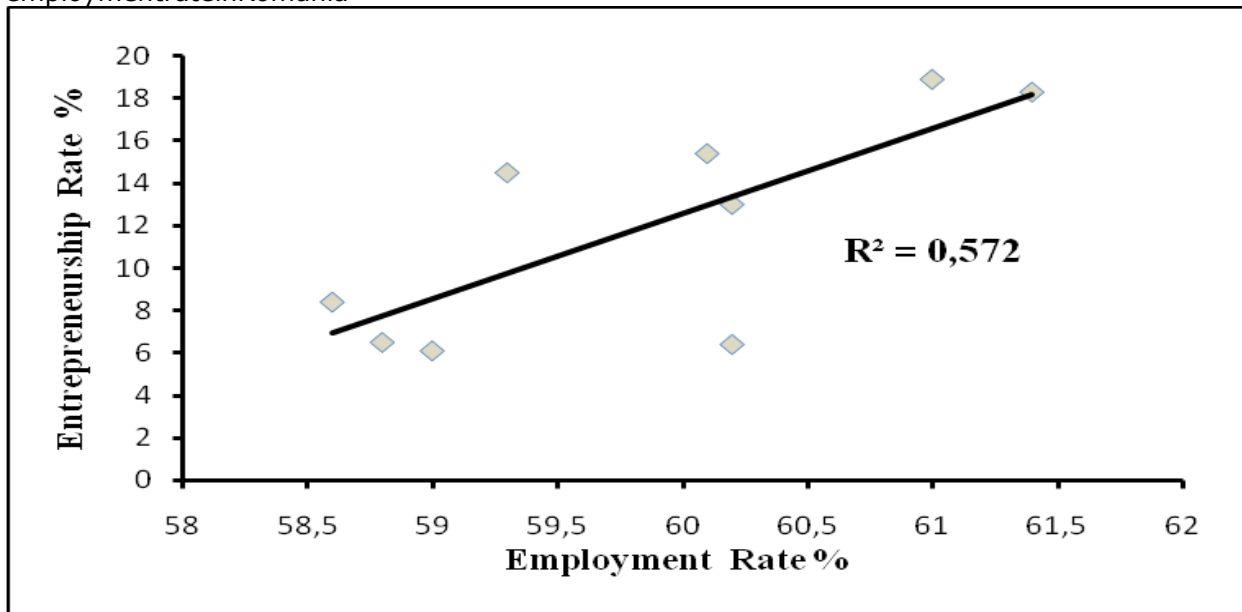
**Source:** Personal data processing based on the data provided in Table 3

This correlation highlights a characteristic of the Romanians' entrepreneurial behavior- the propensity of risk-taking in businesses increases as their capacity is confirmed by undertaking professional activities and hence by accumulating experience, as an employee. This represents actually the path recommended by specialist to ensure the business success

chances. of course,  according to the identified correlation the reverse reasoning is also true- the decrease in employment rate will generate a reduction in the predilection for risk taking due to a decrease in their own capacity and in the external and internal economic environment, and thereby a lower interest for the entrepreneurial initiatives.

Profiling this behavior reflects the high degree of subject for decision making in terms of entrepreneurial activities and the need to increase the entrepreneurial culture of the population by including programs of economic education, especially entrepreneurship, and personal development, appropriate in all stages of education process.

## 4. The correlation entrepreneurship - GDP/capita analysis

In order to determine the strength of the correlation between the total rate of entrepreneurship and the GDP /capita by using Data Analysis tool, we shall use the data submitted in table no. 5.

**Table 5:** GDP/capita and the Entrepreneurship Rate in Romania

| Indicators | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|
| ER % | 6,5 | 6,1 | 8,4 | 6,4 | 14,5 | 13 | 15,4 | 18,9 | 18,3 |
| GDP/capita (US$) | 7697,2 | 9291,7 | 7542 | 7542 | 8863 | 7935 | 8910 | 10035 | 12800 |

**Source:** Summary from the available data on the World Bank website (http://data.worldbank.org/indicator/NY.GDP.PCAP.CD, accessed online at 01/06/2016) and in "Global Entrepreneurship Monitor" reports annual 2008 -2015

The obtained results shown in table no.6 reflect a high and positive correlation between the two indicators (r=0.68), the evolution of the average entrepreneurial rate being influenced of 47.53% by the GDP/capita evolution.

**Table 6:** Table of results using the regression method regarding the strength of the correlation between GDP/capita and the Entrepreneurship Rate in Romania

| Regression Statistics | |
|---|---|
| Multiple R | 0,689426 |
| R Square | 0,475308 |
| Adjusted R Square | 0,400352 |
| Standard Error | 4,018729 |
| Observations | 9 |

ANOVA

| | df | SS | MS | F | Significance F |
|---|---|---|---|---|---|
| Regression | 1 | 102,4109 | 102,4109 | 6,34116 | 0,039917 |
| Residual | 7 | 113,0513 | 16,15019 | | |
| Total | 8 | 215,4622 | | | |

**Source:** personal data processing using Excel

The validity of the obtained correlation is supported by the positive value of the test F (6.34) as well as by the value lower than 0.05 of the materiality threshold (0.03).

The linear and positive correlation between the two indicators, represented graphically in diagram no.4, proves that a decrease in GDP/capita (impacting on the population living standards) generates the reduction in entrepreneurial activities and vice versa. Becomes evident this time again, the flexibility necessity of the strategies and exciting tools in the field of entrepreneurship.

**Diagram 4:** The diagram of the correlation between the correlation between GDP/capita and the Entrepreneurship Rate in Romania
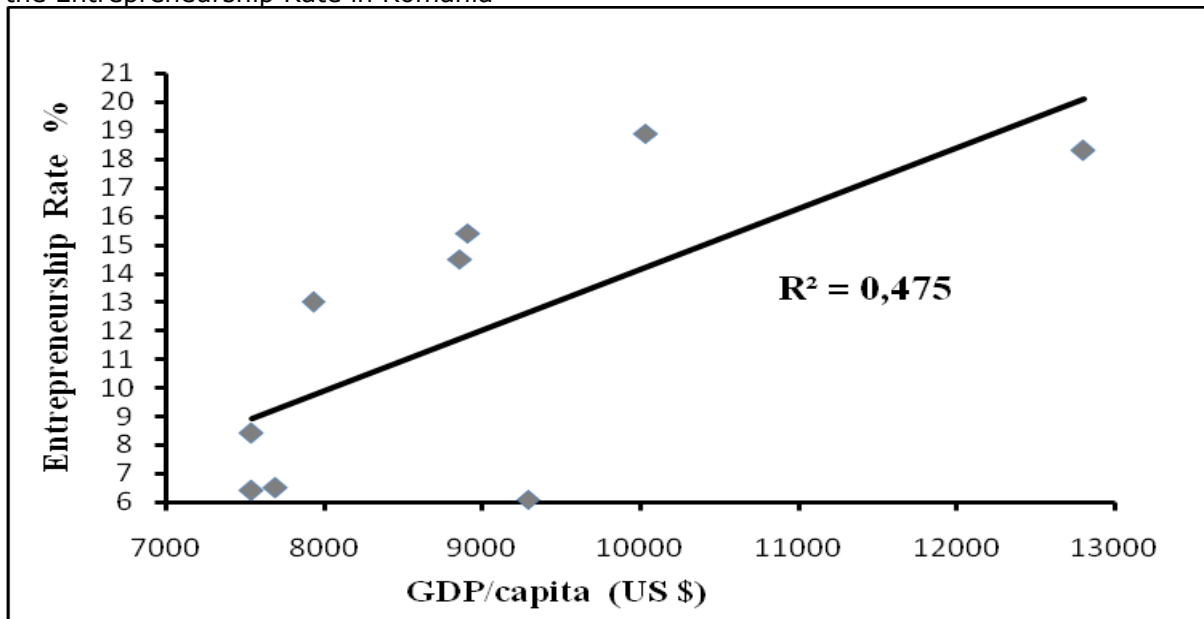


**Source:** personal data processing based on the data provided in Table 5

Thus, in order to stimulate the entrepreneurial process when the GDP/capita and the employment rate are decreasing, (characteristic evolutions during periods of economic recession) the measures must cover:

-        developing the entrepreneurial spirit by increasing the cultural level (the educational system and the research-development sector in this case being the main beneficiaries)

-        facilitating the access to business financing and promoting non-conventional forms of financing

-        creating a favorable legal framework for a coordinated support of the entrepreneurial process, using the business incubators, mentoring, business centers.

At the same time, during the expansions periods of the GDP/capita, the emphasis should be on tax incentives given to those that initiate or carry out entrepreneurial activities and on the optimization of the institutional and regulatory framework (reducing the bureaucracy represents from this perspective an important factor).

**References:**

[1] Foundation Post Privatization, Innovation and entrepreneurship pillars of competitiveness, 2013
[2] Global Entrepreneurship Monitor, Annual Reports 2008 - 2016
[3] Porter E. Michael, Building the Microeconomic Foundations of Prosperity: Findings form the    Microeconomic Competitiveness Index , in Global Competitiveness Report 2002-2003, World  Economic Forum, Geneva, Switzerland, 2003
[4] The Global Competitiveness Report, Annual Reports 2008 -2016
[5] http://data.worldbank.org/indicator/NY.GDP.PCAP.CD, accessed online la 1.06.2016
[6] http://ec.europa.eu/eurostat/web/lfs/data/database, accessed online la 1.06.2016