Different Levels of Corruption Influence on the Main Components of the Macroeconomic Environment

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Abstract

A country that isn’t able to control and eliminate the problem of corruption suffers important losses at the economic and social wellness level. The aim of this study is to analyze if the components of the macroeconomic environment are influenced by corruption and to show the nature of this influence. Analyzing the corruption data from Corruption Perceptions Index 2013 and the data for the Government budget balance, Gross national savings, inflation, Gross general debt and Country credit rating from The Global Competitiveness Report 2013-2014, the results are expected to reveal the existence of strong, but different connections between these variables.

Keywords: corruption; macroeconomic environment; balance of government budget; inflation; gross national savings; government debt; country credit;

1. Introduction

In the actual economies, the public role multiplies and its importance in the economic environment amplifies. The local, national and global programs for the illness control, against the pollution and violence, the judicial, monetary and environment protection regulations, good quality governance, the individual and collective security, the actions for influencing competitiveness (legislation, context-conditions, economic politics) represent significant categories of ways of public actions. Without these elements, the market isn’t able to function in an efficient and proper manner and to generate healthy and qualitative results. The unity between the public sector and the market is organic and the manner of action of the public actors and of the citizens with key roles in the social, economic and political reality that

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inevitably relate with the public zone are essential factors for the macroeconomic annual results of a state. In these conditions, the accent put on the correctness of the public actors is logically explicable and the discussion about the impact of it on the macroeconomic environment is justifiable. The public institutions model the market using the norms from its basis of function, watch to the conformation of the economic actors to these norms and correct the functional market mechanism. In the situation in which the self-interest is over the social interest, these functions degenerate and income inequality, illegitimate economic biases, disadvantageous conjunctures generating negative externalities inevitably appear. In this context, the corruption phenomenon appears and eludes the rules, the transparency and the impersonal and impartial aspect of public actions, but, also, the responsibility for all these irregularities, being the opposite of the public integrity concept.

2. The macroeconomic environment stability

The macroeconomic environment points on the stability and dimensions of some different aspect from the national level. Gross Domestic Product is the main variable to which almost all the variables that describe the macroeconomic environment are related. In this context, Government budget balance, Gross national budget and Gross general debt are calculated as percentages of GDP. Near by these three components, inflation and country credit rate are component parts of the macroeconomic environment, as Schwab (2013) in The Global Competitiveness Report reveals.

The first dimension, Government budget balance (gov_budget), is measured as the Government budget balance as a percentage of GDP in The Global Competitiveness Report 2013-2014. The second, Gross national savings (gross_nat), represents the Gross national budget as a percentage of GDP; Inflation (inflation) is the annual percent change in consumer price index; General government debt (gen_gov) is also seen in relation with GDP, being Gross general debt as a percentage of GDP; near them, Country credit rating (country_credit) is seen as the expert assessment of the probability of sovereign debt default on a 0-100 (lowest probability) scale (Schwab, 2013).

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Exploring the situation of Romania, it can be seen that it is situated on the 47th position between 148 countries when the macroeconomic environment in its totality is put into discussion in The Global Competitiveness Report 2013-2014. Taking into consideration that our country has the 76th place on the national competitiveness top, this position for the macroeconomic environment is a good one. The government budget balance is a negative balance revealed by the negative score of the sub-index used here (-2,5), meaning that the country registers government budget deficit. The country has the Gross national savings equal to 23,2% from GDP, meaning that personal saving, plus business saving (the sum of the capital consumption allowance and retained business profits), plus government saving (the excess of tax revenues over expenditures), but excluding foreign saving (the excess of imports of goods and services over exports) as a percentage from GDP has the value of 23,2 and the rank of 55. The rate of inflation is 3,3, value situated up by the middle on the 62nd position. Romanian general government debt is 37% from GDP, being situated on the 59th position from a list of 148 countries and its Country credit rating has a score equal to 50,3 and a rank of 67.

<table>
<thead>
<tr>
<th>Romania</th>
<th>Rank</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government budget balance, % GDP</td>
<td>66</td>
<td>-2.5</td>
</tr>
<tr>
<td>Gross national savings, % GDP</td>
<td>55</td>
<td>23.2</td>
</tr>
<tr>
<td>Inflation, annual % change</td>
<td>62</td>
<td>3.3</td>
</tr>
<tr>
<td>General government debt, % GDP</td>
<td>59</td>
<td>37</td>
</tr>
<tr>
<td>Country credit rating</td>
<td>67</td>
<td>50.3</td>
</tr>
<tr>
<td><strong>Macro. Environment</strong></td>
<td><strong>47</strong></td>
<td><strong>5.1</strong></td>
</tr>
</tbody>
</table>

Source: The Global Competitiveness Report 2013-2014, authors’ processing

3. Corruption

Around the world, all nations complain of corruption and as it is observed in the Corruption Perception Index 2013, no country has a maximum score which shows that a country is totally clean. A country that isn’t able to control and eliminate this problem suffers important losses of economic and social wellness.

Corruption is the divergence from the public integrity concept. This negative phenomenon has impact on the good governance and the correlation between it and the macroeconomic environment stability is logically argued. Corruption is an action made by private individuals or companies that do not behave into an ethically manner and abuse by the public resources. These private individuals or companies cannot act alone. They have to be connected to the public actors that intermediate their abusive action and, so, deviate from the rules imposed by their public status. It never has to be forgotten that these corruption actions are always made by the public officials not for the general interest, but only for the private one.

The common used index to measure corruption is Corruption Perception Index, published by Transparency International, a global coalition against corruption. It analyses the perception of the national corruption of those in a position to offer assessments of public sector corruption – business people and country experts and not the number of prosecutions brought or studied court cases directly linked to this phenomenon. This way of measurement is considered more relevant and more realistic to show the real information about the manner of action in the public sphere of the countries.

In the next graph, it can be observed that the best percentages are given for the political parties in the majority of the countries, meaning that this institution is seen as the most corrupt one from the public sector.
In the BRIC countries, between 71% and 86% of respondents consider that the political parties do not have part of integrity. The highest percentage is the one of India (86%). We emphasize this economic group because it has the highest scores at this aspect from all the countries revealed in the graph. The lowest percentage is the one from United Kingdom (66%), that is still a high one. In conclusion, generally speaking, the political parties, are perceived as being extremly corrupt by the majority of the countries (75%), being situated in the top of the most corrupt public institutions list. The Parliament detains the second place on the mentioned top as the data from the „Global Corruption Barometer 2013”, realized by Transparency International, reveal with 68% of respondents that perceive it as being extremly corrupt. Separately discussing, the percentages are divided between 48% for Germany and 83% for Russian Federation. As a general conclusion for the two mentioned institutions, it is observed that both detain a negative image in all the countries, more than 50% of the respondents considering them very corrupt. The business zone and the Judiciary, as an average of the scores of all countries, obtain the lowest score (53%). If the perceptions from the Business zone are more constant, in the case of Judiciary, the differences are more significant, being situated even at extremes: 20% for Germany; 24% for United Kingdom and 86% for Bulgaria; 87% for France). Also, 61% of all the respondents consider that the public officials are corrupt. The scores fluctuate between 45% for United Kingdom and 92% for Russian Federation.
4. Research question

The macroeconomic environment pillar of the national competitiveness dimension is divided into five sub-indices with high importance for the stability of this pillar. The corruption phenomenon is one of the major factors that contribute to the decay of the common well-being. The macroeconomic stability being one of the keys for this general well-being and being created and conducted especially by the public authorities, the connection and correlation between the two variables—corruption and macroeconomic environment stability—are theoretically evident. For a deeper analysis, the aim of this paper is to discover if the dimensions of the macroeconomic pillar are equally influenced by the level of national corruption and, if not, which dimension is more influenced by this aspect. In this context, the paper also aims to emphasize the major role of the public integrity or, contrary, of the corruption phenomenon, on the economic scene. Next, we will try to put in evidence these problems and to try to identify the answers and the reasons for the identified inequalities.

For this aim, we chose 100 countries and analyzed them in terms of corruption and macroeconomic environment stability and correlating them. The selected countries are from all stages of development as they are grouped in The Global Competitiveness Report 2013-2014: Stage 1: Factor-driven (26 selected economies), Stage 2: Efficiency-driven (30 selected countries) and Stage 3: Innovation-driven (35 economies). Near them, we found as being well known and important countries especially for our Romanian context, another 9 countries that are not included in these stages of development, being in transition from a stage to another: Brazil, Russian Federation, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia. In these conditions, we added them to our analysis. We used two indices for each regression—the Corruption Perceptions Index 2013 (cpi_2013) as the common and independent variable for all our five regressions, and, as dependent variables, separately for each regression, five variables—Government budget balance (gov_budget), Gross national savings (gross_nat), Inflation (inflation), General government debt (gen_gov) and Country credit rating (country_credit).

The first dependent variable, Government budget balance (gov_budget), is measured as the Government budget balance as a percentage of GDP in The Global Competitiveness Report 2013-2014. The second, Gross national savings (gross_nat), represents the Gross national budget as a percentage of GDP; Inflation (inflation) is the annual percent change in consumer price index; General government debt (gen_gov) is also seen in relation with GDP, being Gross general debt as a percentage of GDP; also, Country credit rating (country_credit) is seen as being the expert assessment of the probability of sovereign debt default on a 0-100 (lowest probability) scale (Schwab, 2013).

The independent variable was taken from Corruption Perception Index 2013 from the Transparency International official site and all our five dependent variables from The Global Competitiveness Report 2013-2014 from the Web Economic Forum official site.

5. Results and discussion

Five Spearman Rank Correlation tests and five regressions were performed for all the countries (100) included in the analysis. Since this is a cross-sectional analysis, robust errors estimation method was used for estimating the relation between the two variables for each regression from the present analysis.

For the economy of paper space, we grouped the results of our regressions in two tables, emphasizing that each regression is numbered in the following way: model 1 - cpi vs. gov_budget; model 2 - cpi vs. gross_nat; model 3 - cpi vs. inflation; model 4 - cpi vs. gen_gov; model 5 - cpi vs. country_credit.

Table 2: The estimation of the calculated correlation coefficients - Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. cpi vs. gov_budget</td>
<td>.130*</td>
<td>.017</td>
<td>.008</td>
<td>.178*</td>
</tr>
<tr>
<td>2. cpi vs. gross_nat</td>
<td>.321*</td>
<td>.103</td>
<td>.095</td>
<td>.001*</td>
</tr>
<tr>
<td>3. cpi vs. inflation</td>
<td>.482*</td>
<td>.232</td>
<td>.225</td>
<td>.000*</td>
</tr>
<tr>
<td>4. cpi vs. gen_gov</td>
<td>.322*</td>
<td>.104</td>
<td>.095</td>
<td>.001*</td>
</tr>
<tr>
<td>5. cpi vs. country_credit</td>
<td>.843*</td>
<td>.710</td>
<td>.707</td>
<td>.000*</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), cpi_2013
b. Dependent Variables: gov_budget, gross_nat, inflation, gen_gov, country_credit

For the model 1, the regression analysis indicates that a low connection between cpi_2013 and gov_budget exists, because the correlation report has a low and positive value (R=0.130). R square indicates that only 1.7% of the dependent variable variation is explicated by the variation of the independent variable. Also, the estimated value of the multiple adjusted determination report obtained in the estimation of the calculated correlation coefficients (table 1, model 1) reveals with a higher precision the influence of the independent variable on the dependent variable, indicating that the variation of the cpi_2013 variable explicates only 8% of the gov_budget variation. Also, the correlation report test (Sig. F= 0.178) > (\(\alpha = 0, 05\)) shows that between the considered variables does not exist a significant relation; the determination report test (Sig. F= 0.178) > (\(\alpha = 0, 05\)) indicates that, statistically speaking, it doesn’t exist a significant relation between the two chosen variables; the regression model’s test (Sig. F= 0.178) > (\(\alpha = 0, 05\)) does not guaranty, as it should, with a 95% trust, that the model is statistically significant (table 1, model 1).

For the model 2, the regression analysis indicates that a connection between cpi_2013 and gross_nat exists, because the correlation report has a positive value (R=0.321). R square indicates that 10.3% of the dependent variable variation is explicated by the variation of the independent variable. Also, the estimated value of the multiple adjusted determination report obtained in this estimation of the calculated correlation coefficients (table 1, model 2) reveals with a higher precision the influence of the independent variable on the dependent variable, indicating that the variation of the cpi_2013 variable explicates only 9.5% of the gross_nat variation. Also, the correlation report test (Sig. F= 0.001) < (\(\alpha = 0, 05\)) shows that between the considered variables does really exist a significant relation; the determination report test (Sig. F= 0.001) < (\(\alpha = 0, 05\)) indicates that, statistically speaking, it exists a significant relation between the two chosen variables; the regression model’s test (Sig. F= 0.001) < (\(\alpha = 0, 05\)) guaranties, with a 95% trust, that the model is statistically significant (table 1, model 2).

For the model 3, regression indicates that a connection between cpi_2013 and inflation exists, because the correlation report has a positive value (R=0.482). R square indicates that 23.2% of the dependent variable variation is explicated by the variation of the independent variable. Also, the estimated value of the multiple adjusted determination report obtained in this estimation of the calculated correlation coefficients (table 1, model 3) reveals with a higher precision the influence of the independent variable on the dependent variable, indicating that the variation of the cpi_2013 variable explicates 22.5% of the inflation variation. Also, the correlation report test (Sig. F= 0.000) < (\(\alpha = 0, 05\)) shows that between the considered variables does really exist a significant relation; the determination report test (Sig. F= 0.000) < (\(\alpha = 0, 05\)) indicates that, statistically speaking, it exists a significant relation between the two chosen variables; the regression model’s test (Sig. F= 0.000) < (\(\alpha = 0, 05\)) guaranties, with a 95% trust, that the model is statistically significant (table 1, model 3).

For the model 4, regression indicates that a connection between cpi_2013 and gen_gov exists, because the correlation report has a positive value (R=0.322). R square indicates that 10.4% of the dependent variable variation is explicated by the variation of the independent variable. Also, the estimated value of the multiple adjusted determination report obtained in this estimation of the calculated correlation coefficients (table 1, model 4) reveals with a higher precision the influence of the independent variable on the dependent variable, indicating that the variation of the cpi_2013 variable explicates 9.5% of the gen_gov variation. Also, the correlation report test (Sig. F= 0.001) < (\(\alpha = 0, 05\)) shows that between the considered variables does really exist a significant relation; the determination report test (Sig. F= 0.001) < (\(\alpha = 0, 05\)) indicates that, statistically speaking, it exists a significant relation between the two chosen variables; the regression model’s test (Sig. F= 0.001) < (\(\alpha = 0, 05\)) guaranties, with a 95% trust, that the model is statistically significant (table 1, model 4).

For the model 5, regression indicates that a strong connection between cpi_2013 and country_credit really exists, because the correlation report has a high and positive value (R=0.843). R square indicates that 71% of the dependent variable variation is explicated by the variation of the independent variable. Also, the estimated value of the multiple adjusted determination report obtained in this estimation of the calculated correlation coefficients (table 1, model 4) reveals with a higher precision the influence of the independent variable on the dependent variable, indicating that the variation of the cpi_2013 variable explicates 70.7% of the country_credit variation. Also, the correlation report test (Sig. F= 0.000 < (\(\alpha = 0, 05\)) shows that between the considered variables does really exist a significant relation; the determination report test (Sig. F= 0.000) < (\(\alpha = 0, 05\)) indicates that, statistically speaking, it exists a significant
relation between the two chosen variables; the regression model’s test (Sig. F= 0.000) < (α = 0.05) guaranties, with a 95% trust, that the model is statistically significant (table 1, model 5).

For a better perspective and comparison, we put the data in four pie graphs, revealing that the highest influence of the corruption is exerted on the Country credit aspect (70.7%), followed by Inflation (22.5%). The lowest influence is on the cases of Gross national savings and General government debt levels (9.5%).

Figure 4: The influence of the Corruption on the Inflation, Gross national savings, Country credit rate and General government debt variables

From the model’s parameters test results (table 3), we can observe that, at an extension with a unit of the cpi_2013 variable, the variables values advance with different numbers of units, revealing the positive influence that exists between the two variables taken into analysis. Exception is made by inflation from the model 3, where the relation between variables is negative. Also, it can be seen that at a value of cpi_2013 equal to zero (cpi_2013=0), the medium values of the dependent variables are different. It is observed that when, hypothetically speaking, cpi_2013 is equal to zero, the dependent variables are positive with the exception of the Country credit variable. The constant term also becomes significant and implies the existence of other factors that affect the form of macroeconomic environment. These results imply that while corruption is a significant determinant of the Gross national savings, Inflation, General government debt and Country credit rate variables, there are other variables that significantly explain the country evolution in the case of these four variables. So, it can be observed that when cpi_2013 advances with a unit, gross_nat advances with 0.163 units; inflation declines with 0.098 points; gen_gov advances with 0.55 units and country_credit with 1.061. These values become significant taking into consideration that: gross_nat starts from negative values and the average of the scores for this variables on the first stage of development is 15.79; the average of inflation from the countries from the third stage is 2.46 and the minimum inflation starts from a negative value equal to -0.9 for Georgia and -0.7 for Switzerland; gen_gov minimum value is 8.5 for Estonia and minimum country_credit is 7.2 for Zimbabwe. In these conditions, values such 0.163 (gross_nat), -0.098 (inflation), 0.55 (gen_gov) and 1.061 (country_credit) become relevant and significant, proving the influence that corruption exerts on these country variables.

Table 3: The model’s parameters test results - Coefficients'

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>95% Confidence Interval for B</th>
</tr>
</thead>
</table>
These regressions reveal that countries rated as having high cpi_2013, meaning that corruption is low at the national level, tend to have higher values of the Gross national savings, General government debt and Country credit rate variables. Contrary, these countries tend to have low scores on inflation aspect, because the relation between the two variables, meaning corruption and inflation, is negative. In the same way, countries rated as having a high level of corruption revealed through the low value of cpi_2013, tend to have lower scores of the Gross national, General government savings and Country credit rate variables and higher levels of Inflation than the more ethical countries. More specifically, it must be underlined that a high cpi_2013 score means less corruption, 0 indicating highly corrupt and 100 indicating very clean. A country that has a high cpi_2013 rank is expected to have a high rank on the Gross national savings, General government debt and Country credit variables list and, also, a high rank on the Inflation one from The Global Competitiveness Report 2013-2014 that means that uncorrupted countries are also expected to have developed macroeconomic environments.

The scatterplot (Figure 5) depicts the relationship between corruption measured by the Corruption Perceptions Index and Inflation measured as component of the third pillar from the Global Competitiveness Index. It reveals a positive correlation between the two variables, which means that on average the views of corruption are related with the levels of inflation. In other words, countries rated as having low rates of inflation are also perceived as less likely to be corrupt or countries rated as having a high inflation rate are perceived to be more corrupt than the countries with a minor inflation. Therefore, we have proved the hypothesis that the level of inflation is normally correlated with the corruption level. Also, from the graph, it can be observed that countries divide in function of their level of country development:

- one group with a strong negative connection between inflation and cpi_2013, including the countries from the third stage of development; it is situated on the superior part of the graph, emphasized by the high levels of cpi_2013, meaning the low levels of corruption and by the low levels of inflation;
- one group formed by the countries from the transition stage; it is situated under the first group position, revealing a connection between the two variables – lower scores for cpi_2013 variable and higher scores of inflation rate than the ones from the stage three; exception is made by Russian Federation that has a very low score of cpi_2013, meaning high corruption and, at the opposite side, Estonia, with a high level of cpi_2013, meaning lower level of corruption than the countries from this transition stage of development;
- one group composed by the countries from the second stage of development; it is situated under the transition stage, but more on the left side, meaning that the countries from this stage have lower rates of inflation than the countries from the precedent group;
- the last group built-up by the countries from the first stage of development, those that have high levels of inflation and low scores of cpi_2013, meaning high corruption; the extreme position is taken by Ethiopia, that has a very high level of inflation, could be considered in this situation as an “out-sider” of the analyzed countries from the Stage 1.

So, it can be observed that the country development stages delimitate each other very well when corruption and inflation are put in relation.
In the second scatterplot, the situation is similar, but the country grouping position is different, because the low levels of cpi_2013 corresponds to low levels of country credit rate. The countries also divide in dependence of their stages of development in separate groups, with the exception of the Stages 1 and 2, that interflows each other. The strong correlation is well revealed from the figure, graphically proving the results of the regression made between the two variables: cpi_2013 and country_credit.
6. Conclusions

The actual economic context imposes the condition of not neglecting the fundamental aspects of the stability of the macroeconomic environment, prioritizing the short term urgencies or self interests. One of such fundamental aspects that influence macroeconomic environment and its dimensions is corruption. In this study, the levels of the Government budget balance, the Gross national savings, the Inflation, the General government debt and the Country credit rate are related to the level of corruption as it is perceived in every country, to analyze if these elements are influenced by corruption and, if the statements are confirmed, to show the nature of this influence. The results reveal that countries rated as having high cpi_2013, meaning that corruption is low at the national level, tend to have higher values of the Gross national, General government and Country credit variables. Contrary, these countries tend to have low scores on inflation aspect, because the relation between the two variables, meaning corruption and inflation, is negative. The highest influence of the corruption on these dimensions is exerted on the Country credit aspect (70.7%), followed by Inflation (22.5%). The lowest influence is on the cases of Gross national and General government levels (9.5%). More specifically, it must be underlined that a high cpi_2013 score means less corruption, 0 indicating highly corrupt and 100 indicating very clean. That means that the clean countries from the point of corruption view have high values of the three between variables that correlate with its level and low values for a single one – inflation. These results reveal the great importance of the corruption phenomenon because of its impact on the macroeconomic environment stability, especially on some important dimensions as inflation and country credit. Also, these conclusions give birth on some logical questions: why corruption has such an importance for the country credit level? Why inflation and corruption are positively correlated as the relation between cpi_2013 and inflation reveals? In the same way, why corruption and Gross national, General government debt and Country credit rate are negatively correlated? These questions and their possible answers can be part of another papers discussion, in this way trying to develop the overview of this subject.

Appendix A.

Countries included in the study (10)

Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Puerto Rico, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan, United Arab Emirates, United Kingdom, United States - Countries from Stage 3: Innovation-driven (35 economies);

Bangladesh, Benin, Burkina Faso, Cambodia, Cameroon, Ghana, Guinea, Haiti, India, Kenya, Liberia, Mali, Mauritania, Moldova, Mozambique, Nepal, Nicaragua, Nigeria, Pakistan, Rwanda, Senegal, Sierra Leone, Uganda, Vietnam, Yemen, Zambia – Countries from Stage 1: Factor-driven (26 economies);

Albania, Bulgaria, El Salvador, China, Colombia, Costa Rica, Ecuador, Bosnia and Herzegovina, Cape Verde, Georgia, Guatemala, Guyana, Jamaica, Jordan, Macedonia, Mauritius, Montenegro, Morocco, Namibia, Panama, Paraguay, Peru, Romania, Serbia, South-Africa, Suriname, Swaziland, Ukraine, Timor-Leste, Thailand – Countries from Stage 2: Efficiency-driven (30 economies);

Brazil, Russian Federation, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia – countries from the Transition stage.

References