Professor Gheorghe ZAMAN, PhD
E-mail: gheorghezaman@ien.ro
Institute of National Economy, Romanian Academy, Bucharest
Associate Professor Luminita IONESCU, PhD
E-mail: luminita.ionescu@spiruharet.ro
Romanian Academy, Postdoctoral School
Spiru Haret University, Bucharest

THE IMPACT OF INTERNATIONAL ECONOMIC CRISES ON CORRUPTION IN ROMANIA

Abstract: Corruption and fraud represent barriers of economic development. The economy world became internationally integrated, thus the increasing level of corruption has a big influence over economic growth and globalization. While globalization brings benefits to developing countries and economies in transition, expanding globalization can also bring new risks to developing countries and corruption could grow as well. The negative effects of corruption are related to losses of finance and reputation, losing customers' support, limited access to capital, losing market position, etc. The impact of international economic crises could be identified in the pyramid of corruption, where we could observe the magnitude of effects from economic and social points of view. European countries are affected by direct and indirect corruption and a relevant size of the corruption is determined by using the competitiveness indicators.

Keywords: financial crime, corruption, government, fraud.

JEL Classification: C61, D72, H11, H26

1. Introduction

This paper seeks to present some current issues in corruption by examining the causes of the petty corruption and grand corruption, how corruption can induce bureaucracy and reduce economic development (Bratu, 2012, pp. 264–269). The economic crises affected all European countries and key indicators of competitiveness are different from one country to another. In our research, we have presented key indicators of competitiveness reflecting direct and indirect corruption and bureaucracy in international comparison for some European

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selected countries, and we propose a new composite indicator of corruption. We have considered direct corruption related to intellectual property protection, diversion on public funds, irregular payment and bribe and favoritism in decisions of government officials. Indirect corruption is related to juridical independence, burden of government regulation (Nica, 2013a, pp. 179–184), efficiency of legal framework, transparency of government policymaking and strength of auditing and reporting. Most of the time, people perceive a link between corruption and inequality. (Uslaner, 2008, 5–29).

2. Causes of the Current Issues in Corruption

In this paper we consider the causes as being important for the current issues in corruption and we have found different causes for petty corruption and grand corruption. Petty corruption is related to local administration and its causes were explained by the Government in the National Anticorruption Strategy 2008-2010. This Strategy identified the main causes of petty corruption as follows:

☐ unattractive salaries for public servants;

☐ lack of alternative motivation system;

☐ lack of the modern mechanism to process the public documents;

☐ lack of transparency in the public sector;

☐ difficulties to find and maintain qualified personnel in the local administration.

Grand corruption is related to central administration and political state capture. Grand corruption is a complex, big and very real problem, associated with ministers and government. We consider that grand corruption is strongly connected to financial crime, currency counterfeiting, money laundering, intellectual property crime, payment card fraud, computer virus attacks, etc. The relation between petty corruption and grand corruption (Figure no. 1) presents the connection between causes and the two forms of corruption that could influence each other. Also, corruption could be related to the recession (Albu, L. L and Vasile, D. 2009).

In our opinion, systemic corruption can introduce bureaucracy that reduces efficiency and competitiveness. There is a strong connection between corruption and bureaucracy; there are many situations when bureaucracy could cause corruption in public and private sector (Chaikin, D. Sharman, J. C. 2009). This is the reason why the internet and the digital era opened new ways and opportunities for people involved in corruption. Current issues in corruption are related to financial crime and high-tech crimes (Lăzăroiu, 2012, pp. 251–257), such as currency counterfeiting, money laundering, intellectual property crime, payment card fraud, computer virus attacks and cybercrime. Also, current issues in

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corruption could be related to hidden migration (Albu, L. L, Iorgulescu, R. and Stanica, C. 2010).

In the context of economic crises petty corruption could become grand corruption, as presented in Figure no. 1:

Figure no. 1. Relation between petty corruption and grand corruption
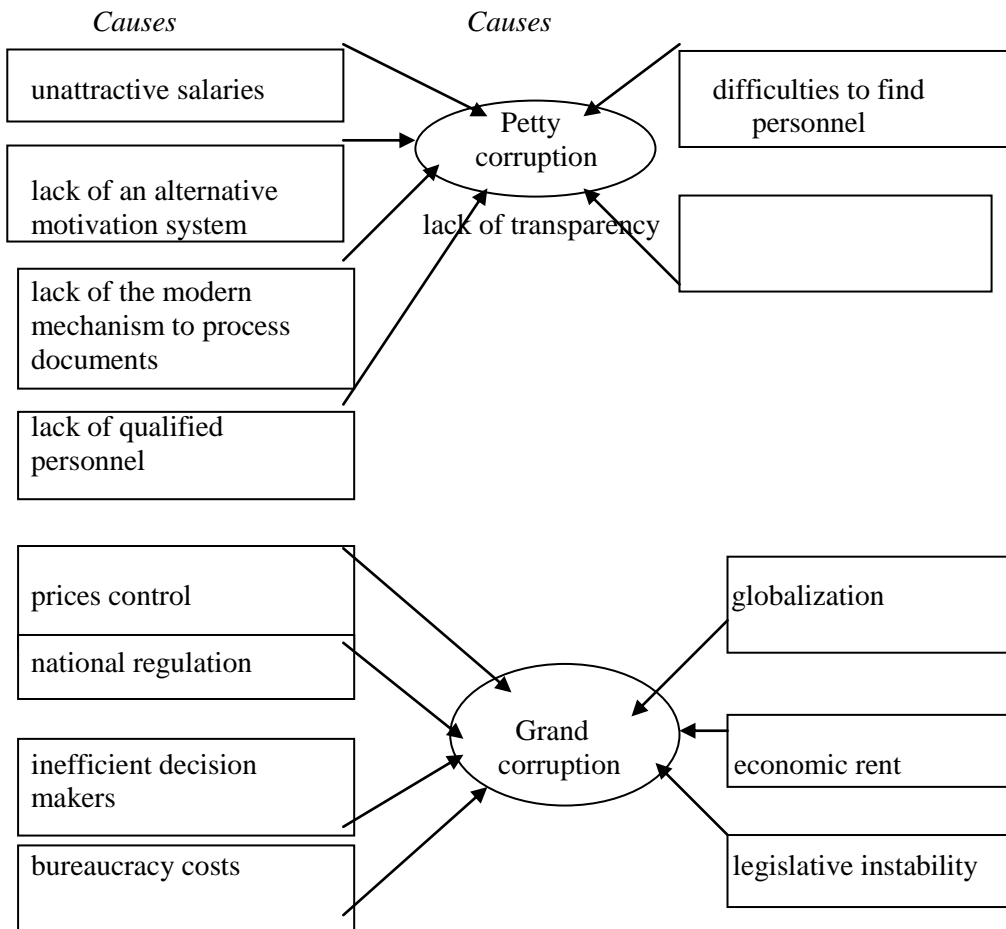
These new issues in corruption affect all levels of the modern society (Nica, 2013b, pp. 124–129), including EU Structural Funds Absorption (Zaman, G. and Cristea, A., 2011), and could involve from one or two persons to a big number of persons, according to the pyramid of corruption (Figure no. 2):

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Figure no. 2. The pyramid of corruption
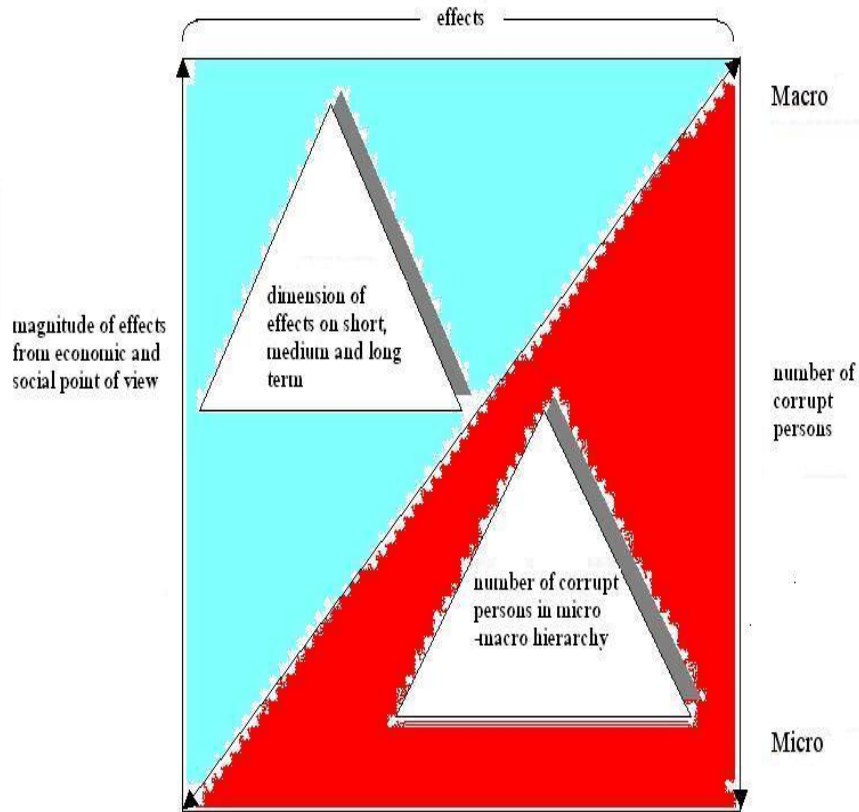
Source: Authors' own calculation

In Figure no. 2 we can see the different dimensions of corruption at macro and micro levels on short, medium and long terms. As a rule, the macro corruption is related to public administration and political entities, and has a medium and long term strong impact without a total recovery of social and economic damages because of deficiencies in law system and of white spread misunderstanding of the accountability in the political milieu, which considers that errors and wrong decisions of political leaders usually are punished with their failure at the next election round.

The micro corruption level is also a domain of interest for the well-functioning of the market oriented economy in Romania. According to our pyramid the number of corrupt people at micro level, of course, is bigger as we compare it with that of macro level. This peculiarity of micro corruption needs a special approach concerning the tools for improving the situation. We refer to magnitude of social

and economic damages, which are related to numerous groups of persons, but, however, could not be as dangerous as those involved in macro corruption.

There is a risk, an unsolved issue regarding the magnitude of aftermaths and negative consequences of both grand and petty corruption. A body of special literature sustains that grand corruption is more dangerous while the other part of specialists proclaims that the petty corruption is more damaging for the soundness of economy. We consider that both types of corruption should be taken into consideration by competent institutions with the same seriousness and involvement, although on short term, priority setting could be focus on. For instance, in Romania, the big corruption should be a priority especially in the field of EU financial instruments related to structural and cohesion funds in the period 2007-2013, approached by each type of sectorial operational programme (SOP).

3. Analysis of Corruption based on Competitiveness Indicators

Besides the grand and petty corruption, we consider as being very important the distinction between direct and indirect corruption, which takes place at both micro and macro levels. In order to shed more light on these aspects, we used a series of indicators characterizing the categories of direct and indirect corruption. We consider that direct corruption is reflected by those actions and effects generated by the persons involved in corrupt activities (Lăzăroiu, 2013, pp. 82–87), which have to do with intellectual property protection, diversion of public funds, irregular payment and bribe and favoritism in decisions of government officials. Indirect corruption is rather committed to short comings of juridical independence, burden of government regulation, efficiency of legal framework, transparency of government policy, strength of auditing and reporting.

There are many factors that might affect the expected benefits from corruption (Nicolăescu, 2013a, pp. 198–203), but most corrupt acts involve a bargain between the official and private actors. Thus, the public servant uses the powers of office to obtain unjustified illegal gains for interested parties beyond those he could earn without his intervention. There are situations where state actions — regulation, taxation, etc. — could be used to give advantages over other competitors in the market. There are some situations when legal framework and public tools such as: government regulation, taxation, etc. are misused in their application by the public servant in favor of some interested parties involved in the privatization state owned property or in some others business (Treisman, D. 2000). There are many models to determine a powerful algorithm of estimating the probability distribution parameters (Ruxanda, Gh., Smeureanu I. 2012), but in the following analysis we propose a composite indicator to determine a more comprehensive corruption index, using a set of direct (Icd) and indirect indicators (Ici):

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Table 1. Key Indicators of Competitiveness Reflecting Direct Composite Corruption in International Comparison

Indicators	Direct Corruption			
Countries	Intellectual property protection	Diversion of public funds	Irregular payment and bribe	Favoritism in decisions of government officials
Mean Value	**3.8**	**3.6**	**4.2**	**3.2**
Maxim value	**6.3**	**6.5**	**6.7**	**5.4**
Minim value	**1.6**	**1.6**	**2.2**	**1.8**
Romania	**2.9**	**2.5**	**3.7**	**2.4**
Switzerland	**6.0**	**6.0**	**6.2**	**4.9**
Sweden	**5.6**	**6.0**	**6.2**	**5.3**
U.K.	**5.9**	**5.7**	**5.9**	**4.2**
Poland	**3.6**	**4.0**	**4.9**	**3.3**
Czech Rep.	**3.8**	**2.3**	**3.8**	**2.4**
Hungary	**4.0**	**2.6**	**4.3**	**2.6**
Slovak Rep	**3.8**	**2.5**	**3.6**	**2.6**
Bulgaria	**3.0**	**2.9**	**3.8**	**2.6**
Ukraine	**2.7**	**2.5**	**2.7**	**2.5**
Greece	**2.5**	**2.5**	**3.4**	**2.5**
Moldova	**2.8**	**2.6**	**3.4**	**2.5**

Source: Global Competitiveness Report 2012-2013, WEF Geneva 2013
and authors own calculation

In the table above we have presented the comparative analyses of competitiveness in Romania and other European countries for year 2012, where we indicated number 1 as very weak and number 7 as very strong situation in each country.

Table 2. Key Indicators of Competitiveness Reflecting Indirect Composite Corruption in International Comparison

Indicators	Indirect Corruption				
Countries	Juridical independence	Burden of government regulation	Efficiency of legal framework	Transparency of government policy	Strength of Auditing and reporting
Mean Value	**3.9**	**3.4**	**3.8**	**4.3**	**4.3**
Maxim value	**6.7**	**5.6**	**6.2**	**6.2**	**6.6**
Minim	**1.3**	**2.0**	**1.9**	**2.6**	**2.6**

The Impact of International Economic Crises on Corruption in Romania

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value					
Romania	2.7	2.8	2.6	3.3	4.0
Switzerland	6.3	4.3	5.7	5.9	5.5
Sweden	6.2	4.0	5.6	5.5	5.9
U.K.	6.2	3.4	5.4	5.3	5.9
Poland	4.2	2.6	3.1	3.8	5.2
Czech Rep.	3.7	2.7	3.1	4.0	4.9
Hungary	3.7	2.3	3.0	3.8	5.1
Slovak Rep	2.7	2.6	2.4	4.2	4.3
Bulgaria	2.9	3.0	2.8	3.6	4.3
Ukraine	2.5	2.4	2.4	3.6	3.8
Greece	3.1	2.2	2.5	3.7	4.4
Moldova	2.1	3.0	2.9	4.4	4.2

Source: Global Competitiveness Report 2012-2013, WEF Geneva 2013
and authors own calculation

According to these analyses, Romania is situated close the mean value of key indicators of competitiveness reflecting direct and indirect corruption and bureaucracy in European countries. Thus, for intellectual property protection Romania has a value of 2.9 with the mean value of 3.8; for diversion of public funds Romania has a value of 2.5 and the main value is 3.6; about favoritism in decisions of government officials Romania has a value of 2.4 and the mean value is 3.2; about irregular payment and bribe Romania has a value of 3.7 and the mean value is 4.2; regarding juridical independence Romania has a value of 2.7 and the mean value is 3.9; about efficiency of legal framework in settling disputes Romania has a value of 2.6 and the mean value is 3.8. Finally, as it concerns transparency of government policy making, Romania has a value of 3.3 and the mean value is 4.3. We observe that in case of auditing and reporting, Romania is very close to the mean value, with an indicator of 4.0 and the mean value is 4.3. These indicators are very efficient to evaluate the regional competitiveness of the EU regions (Mereuta, C. et al., 2007).

If we analyze the diversion of public funds, the most reduced level is registered in Switzerland or Sweden and the diversion is very common in Ukraine, Greece and Czech Republic. Also, Romania has a low indicator in this case. As it for irregular payment and bribe, we have observed that very clean countries are Switzerland, Sweden and U.K, but the countries where is common to make undocumented extra payment and bribe are Ukraine, Greece and Moldova.

Favoritism in decisions of government officials indicated how countries such as Sweden and Switzerland show very little favoritism, but other countries show favoritism to well-connected firms and individuals when deciding contracts, such as Romania, Czech Republic, Ukraine, Greece and Moldova. If we analyze the burden of government regulation, we observe that most of the countries have burden of regulations and difficulties for business, for example Switzerland indicate 4.3, the U.K. indicates 3.4 and Romania 2.8. The mean value for burden of

government regulation is 3.4. On the low level there is situated Ukraine with 2.4 and Greece with a 2.2. indicator. We have presented the direct and indirect indicators of corruption in Table no. 3:

Table 3. Direct and Indirect Indicators of Corruption

Direct Indicators	Indirect Indicators
Intellectual property protection	**Juridical independence** - not enough independence and objectivity
Diversion on public funds	**Burden of government regulation** - instability and non-predictability - bureaucracy
Irregular payment and bribe	**Efficiency of legal framework** - lack of transparency - frequently changing create confusion
Favoritism in decision of government officials	**Transparency of government policymaking** - some of government measures are considered confidential without a well-grounded motivation
-	**Strength of auditing and reporting** - auditing and reporting activities are sometimes hiding the real situation as a result of incorrect evaluation of facts due to some hidden interest of auditors seduced by bribe or other advantages from the managers of audited entity

The proposed method to determine the index of corruption (Ic) takes into consideration the following aspects:
- direct corruption is quantified by the first four indexes in Table no. 1 and reflects the major part of corrupt behaviors at macro level, reason for which their average level is multiplied by 0.7 weight;
- indirect corruption indicators refer to the following five indicators: juridical independence, burden of government regulation, efficiency of legal framework, transparency of government policymaking, strength of auditing and reporting (Nicolăescu, 2013b, pp. 106–111), which are more less favoring, helping or inducing direct corrupt behaviors, multiplied by a relatively low 0.30 weight.

We consider that this new indicator of corruption offers a more relevant size of corruption that can be used for international comparative analyses:

$$Ic = \frac{\Sigma_{k=1}^{n} Icd_k}{n} * w_{cd} + \frac{\Sigma_{l=1}^{m} Ici_l}{m} * w_{ci}$$

where:

Ic = composite corruption index

Icd_k = index of direct corruption,

$k = \overline{1, n}$

Ici_l = index of indirect corruption

$l = \overline{1, m}$

w_{cd} = 0.70 weight of direct corruption index

w_{ci} = 0.30 weight of indirect corruption index

Indexes of direct and indirect corruption are different from one country to another because of local particularities and economic development. In the last five years these indicators became significant due economic crises that determined countries like Greece to register poor indicators, as we have presented our results in the following table:

Table 4. Composite Corruption Index and Indexes of Direct and Indirect Corruption 2012

Countries	Composite corruption index (Ic)	Index of direct corruption (Icd)	Index of indirect corruption (Ici)
Romania	2.92	2.01	0.91
Switzerland	5.70	4.04	1.66
Sweden	5.67	4.04	1.63
U.K.	5.36	3.79	1.57
Poland	3.89	2.76	1.13
Czech Rep.	2.59	1.49	1.10
Hungary	3.48	2.41	1.07
Slovak Rep	3.15	2.18	0.97
Bulgaria	3.14	2.15	0.99
Ukraine	2.71	1.82	0.89
Greece	2.85	1.90	0.95

Source: authors' own calculation

According to our analyses, Romanian composite corruption index is more favorable than those from Greece, Ukraine or Czech Republic, but not so good as we have found in countries such as Switzerland, Sweden, U.K. or Poland. Composite corruption index for Romania is close to other European countries such as Bulgaria, Slovak Republic, indicating the average of East European countries. Index of direct corruption is more reduced than the composite corruption index, but the hierarchy of the countries remains the same. Thus, for Romania, index of direct corruption is 2.01, more advantageous than Ukraine, Greece and Czech Republic, but lower than indexes from other European countries, such as Switzerland, Sweden, the U.K., Poland or Hungary.

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Finally, if we analyze the index of indirect corruption for Romania, we observe that the indicator is in a better position than indices from Ukraine: Romania has 0.91 and Ukraine just 0.89. The rest of the EU countries presented above have a better index of indirect corruption, which means that strong public reform must be implemented.

4. Corruption model based on the theory of strategic games (Nash optimizations)

A specific corruption model is described and the architecture, performances and the possibilities of using it to solve certain concrete problems are analyzed (Ruxanda, Gh. 2010). In our research, we consider the relation between a taxpayer and a clerk is like a game, because both players collaborate to gain something, the taxpayer to get a good or a public service and the clerk to get undue benefits.

The taxpayer (T) can offer something (m) to the clerk (C), who accepts the bribe(a) or does not accept the bribe($\overline{a}$). During the game, there can be signed agreements between the two players, to correlate some mixt strategies and the utility is transferred from one player to another. For the present case, the taxpayer is the first player while the clerk is the second one.

Thus, the matrix game is like:

$$J = (A, S_i, u_i), \quad i = \overline{1, n}$$

During the game, there can be different strategies S_i for u_i, the gaining function, and A representing the number of the involved players in the corruption game:

$$A = (1, ..., n)$$

The profile of strategy (s) applied by the taxpayer C in the game of corruption is like this:

$$s = (s_1, s_2, ..., s_n)$$, where si $\in$ Si and

$$S = \sum_{i=1}^{n} S_i$$

The clerk's benefit is a function ui in accordance with the strategy s:

$$u_i(s) = u_i(s_1, s_2, ..., s_n)$$, where i = 1, ..., n

In accordance with the equilibrium theory (Nash, 1951), there is a configuration of the game, where a player's benefit will not increase if the player changes

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unilaterally his action, without taking into consideration other player's action. Starting from the notation:

$$(s_k, s_k^*) \leq (s_1^*, s_2^*, ..., s_k^*, ..., s_n^*)$$

the equilibrium theory between bribe and accepted bribe is like the following relation:

$$u_i(s_i, s_i^*) \leq u_i(s^*),$$

For any:

$$i = \overline{1, n}$$ and any si ∈ Si;

and only if the unilateral deviation does not increase the benefit for each player and each strategy. This theory finds an equilibrium point, respectively a stable condition of the corruption game between the taxpayer and the clerk, using concepts of bribe, non-bribe, accepted bribe and refused bribe.

The theory is based on the fact that there will always be a player to offer enough bribe to tempt a clerk. The equilibrium point can be calculated with the following bimatrix:

Figure 3. Bimatrix of corruption

Source: authors' own calculation

By analyzing this bimatrix we have found that the equilibrium point occurs when the taxpayer does not offer bribe to the clerk, namely $u_t(\overline{m}, a)$; where the first player changed his strategy and his benefits will not change, while the second player also changes his strategy and his benefits will also not change, respectively:

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(n, a) represents the equilibrium situation if:

$$u_t(n,a) \lesseqgtr u_t(n,a) \text{ and } u_c(n,a) \lesseqgtr u_t(n,a)$$

In the problem of negotiations, we should take into account the threatening strategy between the two players. Any threat can be included in the game theory, if it leads to maximizing one of the player's advantages; furthermore, it can be negotiated in three successive steps (Owen, 1974, pp. 173-175):

1. the taxpayer chooses a threatening strategy x
2. without being aware of the threatening strategy x, the clerk chooses threatening strategy y
3. both players negotiate on the basis of the threatening strategies. If they conclude an agreement, the game ends successfully and both of them gain reciprocal benefits, if the two players do not agree, then they will use the threatening strategies x and y, and their benefits will be different.

In conclusion, the maxim values m* and a* are replaced by the threatening values xTyt and xCyt. In case the negotiation is favorable, based on Nash's axioms, the result of negotiations is:

$(n, \bar{a})$, where $(n, \bar{a})$ is the point from S, which maximizes the gaining function:

$$g(n,a) = (n - xTy^t)(a - xCy^t) \text{ under the restriction } \bar{m} \geq xTy^t,$$

which means that there are equilibrium points in the corruption game, that rely on the threatening strategies elaborated by the tax payer and the clerk, where both intend to maximize their benefits.

Overall, the corruption phenomenon is not established in accordance with some precise rules; it involves at least two players, but there could be more, who might be represented by other persons not only clerks. Limiting the corruption depends on the person who offers the bribe, respectively the taxpayer, but also on the person who accepts the bribe, respectively the clerk in our case, thus both players are equally guilty.

We distinguish the following situations:

A. If the bribe is large enough and also the number of corrupt clerks is relatively limited then the bribe will eventually reach an equilibrium point.

$$\begin{cases} u_c(m_i, a_i) > u_c(m_j, a_j), \\ \qquad m_i \to \bar{m} \end{cases}$$

B. If the number of corrupt taxpayers is small enough and the number of corrupt clerks is large enough then we find ourselves in monopole.

($\exists \varepsilon > 0$ so that t $\to \varepsilon$, $\forall$ t>0, where ε =10-n, n$\in$N) $\wedge$ (c >>t, $\forall$ c >0, $\forall$ t) $\Rightarrow$ ($\exists!$s, where s=supplier)

C. If the number of corrupt taxpayers is small enough and the number of corrupt clerks is also small enough then we find ourselves in monopole again.

(($\exists \varepsilon > 0$ so that t $\to \varepsilon$)$\wedge$($c \to \varepsilon$), $\forall$ t, c >0 where ε =10-n, n$\in$N) $\Rightarrow$ ($\exists!$s, where s=supplier)

Current literature offers many approaches (Duca, IA., Ruxanda, Gh. 2012), but we consider in our research that corruption game is universal and will never end, because there always will be new players to gain something or to avoid paying taxes to the state. The efforts of the state controllers focus on reducing the level of the game or at least the number of the players, thus corruption could be managed by the public authorities.

5. Conclusions

Corruption is a global growing phenomenon and occurs at all levels of society (Popescu, 2013a, pp. 185–191), from local and national governments, civil society, judiciary functions, large and small businesses, military and other services and so on. We presented in our research the causes of the current issues in corruption and the relation between petty corruption and grand corruption, and also the pyramid of corruption from micro to macro level. Petty corruption helps a large number of people cope with broken public and private sectors, and does not engender jealousy or mistrust. People make a clear connection between inequity and grand corruption (grand corruption troubles people far more than petty misdeeds). Grand corruption leads to social strains (Popescu, 2013b, pp. 130–135) and to perceptions of rising inequality. This pyramid of corruption shows how a small number of corrupt people are at the top (grand corruption) and petty corruption is situated on the low level.

In the second part of our research we have developed an international analysis of corruption based on competitiveness indicators and we have determined the composite corruption index for European countries. We proposed a method of determining index of corruption based on direct corruption index and indirect

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corruption index and we presented our results. Thus, we found that Romanian composite corruption index is much better than those from Greece, Ukraine or Czech Republic, but not so good as we found in countries as Switzerland, Sweden, U.K. or Poland.

In the last part of research we have presented a corruption model based on the theory of strategic games, where the tax payer and a public servant are involved in the game, both of them having corrupt behavior. This is the reason why corruption leads to less trust in public institutions and more inequality (Zaharia & Zaharia, 2013, pp. 192–197) and societies are trapped in a cycle of high inequality, low out-group trust, and high corruption. Our model shows that corruption phenomenon is not established in accordance with some precise rules, but it involves at least two players. It will be always a player to offer enough bribe to seduce a public servant and the equilibrium point can be calculated with the corruption bimatrix.

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Gheorghe Zaman, Luminita Ionescu

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