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Evaluation of Unacademic Behaviour and its Implications on Economic and Social Development

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Abstract. *The estimation of corruption and its effects on the social and economic development of a country is a difficult task. A series of studies have estimated the effects of corruption on the economic development of a sector of activity. This article presents the results obtained at the level of a sample with regard to a series of aspects related to the measurement of corruption and the identification of its causes and of the role played by certain institutions in the growth or reduction of corruption. The statistical information was obtained by means of a statistical questionnaire intended for public administration employees. The data were processed in SPSS.*

Keywords: corruption; factors that lead to the spread of corruption; civil service; statistical questionnaire; corruption impact.

JEL Codes: C00, C83.
REL Codes: 5K, 13I.

1. Introduction

The analysis of corruption is an important area of contemporary economic research. In recent years, the academic and research environment and the international organisations (among which the International Monetary Fund, the World Bank etc.) have shown increased interest in estimating the level of corruption and identifying its causes, the mechanisms through which it is spread within a system and the methods for measuring its impact on the economic and social processes in a country or development region.

Some of the main focuses of corruption-related research are the following:

- measuring the level of corruption in a country or in a certain area of activity;
- identifying the causes that generate corruption in a public system. Among the most important ones are political, juridical, historical, social, cultural and economic factors;
- estimating its effects on the level of development of a sector of activity;
- identifying the relation between the level of corruption and the value system in a society.

2. Presentation of the data series used

In order to obtain the necessary information for evaluating corruption and its implications on aspects related to economic and social development, a sample-based research was designed. The sample included 550 employees working in local public administration, a sample that is representative at national level. The maximum accepted error is ±2%. The questionnaires were completed in November 2009.

These statistical questionnaires enabled the collection of information about the following important aspects related to public administration:

- Quality of management in public administration institutions;
- Civil service reform;
- Reform in public administration;
- Corruption and its implications on economic and social development;
- Bureaucracy, meritocracy and economic development;
- Various information characterising the sample: age, vocational training, type of institution etc.

Most of the questions included in the questionnaire are closed questions. The primary variables for some important aspects related to the analysis of corruption – variables defined based on the questions within the questionnaire – are presented next. For each variable the measurement scale used is defined and the statistical indicators calculated based on the sample level data are presented.

The following important aspects are taken into consideration for the analysis of corruption:

- The measurement of the level of corruption;
- The identification of the causes of corruption;
- The evolution of corruption over a time period;
- The impact of corruption on important areas of activity;
- The contribution of some elements to the reduction of corruption;
- The characteristics of public procurement and its impact on corruption.

3. Measurement of the level of corruption

Based on the information obtained from the questionnaire, seven primary variables are defined for measuring corruption at the level of some sectors of activity. They are defined as follows:

- For assessing the level of corruption in general: $CORG : N \to \{1,2,3,4,5\}$;
- For estimating corruption in education: $CORE : N \to \{1,2,3,4,5\}$;
- For estimating corruption in the health system: $CORS : N \to \{1,2,3,4,5\}$;
- For estimating corruption in politics: $CORP : N \to \{1,2,3,4,5\}$;
- For estimating corruption in local public administration: $CORL : N \to \{1,2,3,4,5\}$;
- For estimating corruption in central public administration: $CORC : N \to \{1,2,3,4,5\}$;
- For estimating corruption in one's own institution: $CORI : N \to \{1,2,3,4,5\}$.

In order to define these variables, a measurement scale with natural values from 1 (Generalised corruption) to 5 (There is no corruption) was used. The distribution of the values of the seven variables at the level of the sample is presented in Table 1.

Table 1

Distribution of the answers received

	1 (Generalised corruption)	2	3	4	5 (There is no corruption)	NR
1. In general	18.0	34.9	30.2	13.0	3.7	0.2
2. Education	5.9	25.6	45.3	18.7	4.5	0.0
3. Health	15.2	36.2	32.7	11.5	3.9	0.6
4. Politics	30.4	35.6	19.5	8.7	5.2	0.6
5. Local public administration	9.3	23.6	37.1	20.6	9.3	0.2
6. Central public administration	13.0	32.3	32.3	14.1	7.8	0.6
7. In your institution	5.9	8.7	19.3	35.1	31.0	0.0

For the seven primary variables the indicators that characterise the mean level and the variation and form of the distribution are calculated. The results obtained are presented in Table 2.

Table 2

Level of corruption by area of activity at national level

	Level of corruption on a scale from 1 to 5
1. In general	2.5
2. Education	2.9
3. Health	2.5
4. Politics	2.2
5. Local public administration	3.0
6. Central public administration	2.7
7. In your institution	3.7
8. CORR	2.8

By using the seven primary variables, the COR aggregate variable is defined based on the application below:

$$\mathrm{CORR}: \mathrm{N} \to [1,5],\ \mathrm{CORR} = \frac{1}{7}(\mathrm{CORG} + \mathrm{CORE} + \mathrm{CORS} + \\ + \mathrm{CORP} + \mathrm{CORL} + \mathrm{CORC} + \mathrm{CORI})$$

The mean level of the COR variable is presented in Table 2. The distribution of the values of this variable is presented in the graph in Figure 1.

The mean values in the above table show the following:

- There is a high level of corruption. The mean value 2.8 is close to the value 3 which indicates a pretty high level of corruption;
- The people employed in administration estimate that the level of corruption in politics is very high;
- The size of corruption at the level of one's institution is apparently much smaller.

Due to this reason it is recommended that corruption at national level be calculated only on the basis of the estimates made for a field the respondent does not belong to. Thus the level of corruption is calculated only on the basis of the following variables: CORG, CORE, CORS, CORP and CORC. A mean value of 2.5 is obtained.

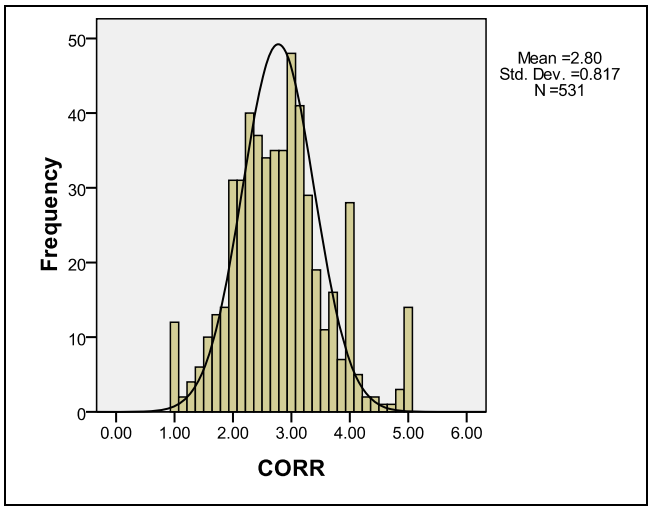

Figure 1. *Distribution of the CORR variable*

4. Causes of corruption

For an identification of the main factors that contribute to maintaining a high level of corruption in the public sector, six elements were taken into account in the questionnaire intended for public sector employees. Based on the information obtained from the questionnaire, six primary variables are defined:

1. the CL variable evaluates the degree to which the legal framework favours corruption;
2. in order to evaluate the extent to which the salary system encourages corruption, the SS variable is defined;
3. the morality of civil servants may represent an important factor favouring corruption. In this respect, the MF variable is defined;
4. the economic environment may favour a high level of corruption in public administration. In order to evaluate the contribution of this factor to favouring corruption, the PE variable is defined;

5. as politicians may represent an important element favouring corruption, the PP primary variable is defined in the study in order to assess their impact on corruption;
6. the behaviour of citizens may favour or reduce corruption. For the evaluation of this factor the CC variable is used.

The six variables are defined based on the following application:

$$CL, SS, MF, PE, PP, CC : N \to \{1,2,3,4,5\}$$

The same measurement scale is used for these variables. The scale is defined as follows: 1 – it does not favour corruption at all, 2 – it favours it to a small extent, 3 – it favours it to a moderate extent, 4 – it favours it to a pretty large extent; 5 – it favours it to a large extent.

For an overall evaluation of the contribution of the elements considered to an increase in the level of corruption, the EFC variable is defined based on the following application:

$$EFC : N \to [1,5],\ EFC = \frac{1}{6}[CL + SS + MF + PE + PP + CC]$$

The distributions of the values of the six primary variables are presented in Table 3.

Table 3

Distribution of the values of the CL, SS, MF, PE, PP and CC variables

	5	4	3	2	1	NR
CL	12.6	13.0	28.9	29.7	14.7	1.1
SS	8.0	9.8	18.4	32.5	30.8	0.6
MF	11.3	15.4	34.1	22.6	15.6	0.9
PE	12.2	15.8	34.0	26.3	11.1	0.6
PP	11.7	11.3	26.2	25.6	24.3	0.9
CC	13.0	23.6	35.6	20.0	6.9	0.9

For the primary variables defined above as well as for the EFC aggregate variable, the mean values are calculated. The results obtained are presented in Table 4 and Figure 2. The distribution of the values of the EFC variable is presented in the graph in Figure 3.

Table 4

Means of the CL, SS, MF, PE, PP and CC variables

	Level of corruption on a scale from 1 to 5
1. Legal framework	3.2
2. Salary system	3.7
3. Morality of civil servants	3.2
4. Pressure exerted by the economic environment	3.1
5. Pressure exerted by the political system	3.4
6. Citizens' behaviour	2.8
7. EFC	3.2

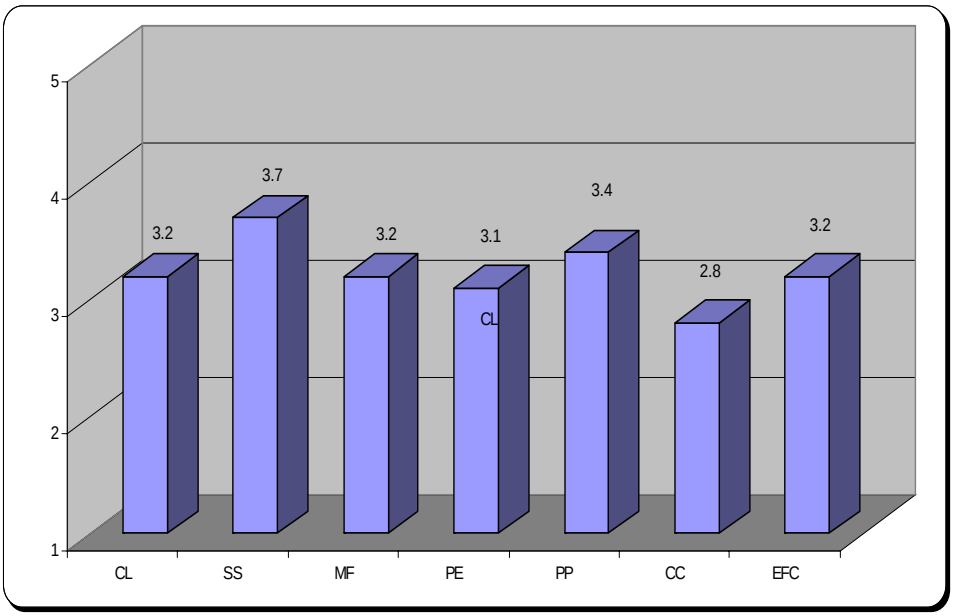

Figure 2. *Means of the CL, SS, MF, PE, PP, CC and EFC variables*

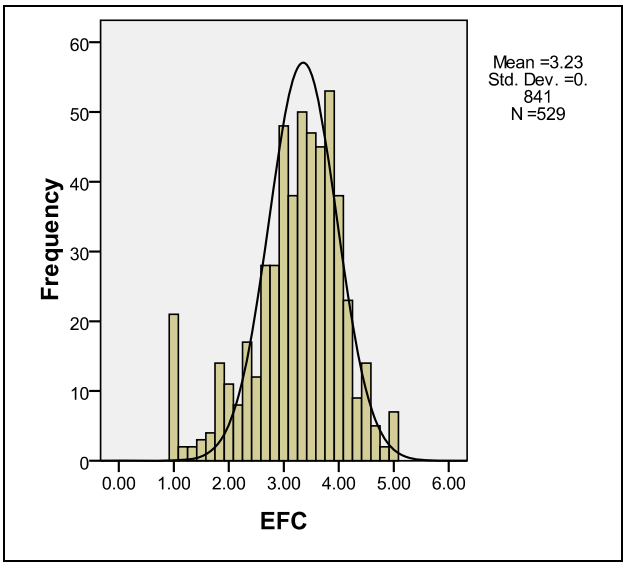

Figure 3. *Distribution of the EFC variable*

5. Evolution of corruption

In order to evaluate people's perception of the current level of corruption as compared to the past period, a question was introduced in the questionnaire. A measurement scale with five values was used to measure their opinions: 1 – the level of corruption has increased to a large extent, 2 – the level of corruption has increased to a moderate extent, 3 – the level of corruption hasn't changed significantly, 4 – the level of corruption has decreased to a moderate extent and 5 – the level of corruption has decreased to a significant extent. Based on the information obtained by asking this question to the people in the sample, the PCT variable is defined:

$$PCT : N \to \{1,2,3,4,5\}$$

The distribution of the values of this variable is presented in Table 5 and in the graph in Figure 4.

In order to evaluate people's anticipations of the evolution of corruption, the following variable is defined:

$$ACV : N \to \{1,2,3,4,5\}$$

For the definition of this variable a measurement scale with five values was used: 1 – the level of corruption will increase to a large extent, 2 – the level of corruption will increase to a moderate extent, 3 – the level of corruption will not change, 4 – the level of corruption will decrease to a moderate level and 5 – the level of corruption will decrease significantly.

The distribution of the values of this variable is presented in Table 5 and in the graph in Figure 4.

Table 5

Distribution of the values of the PCT and AVV variables

Values of the variables	The person's opinion	PCT (past)	AVV (future)
1- (--)	negative	20.0	12.6
2 – (-)		23.9	29.1
3 – (0)		39.3	39.9
4 – (+)		10.9	12.6
5 – (++)	positive	5.2	5.2
NR		0.6	0.6

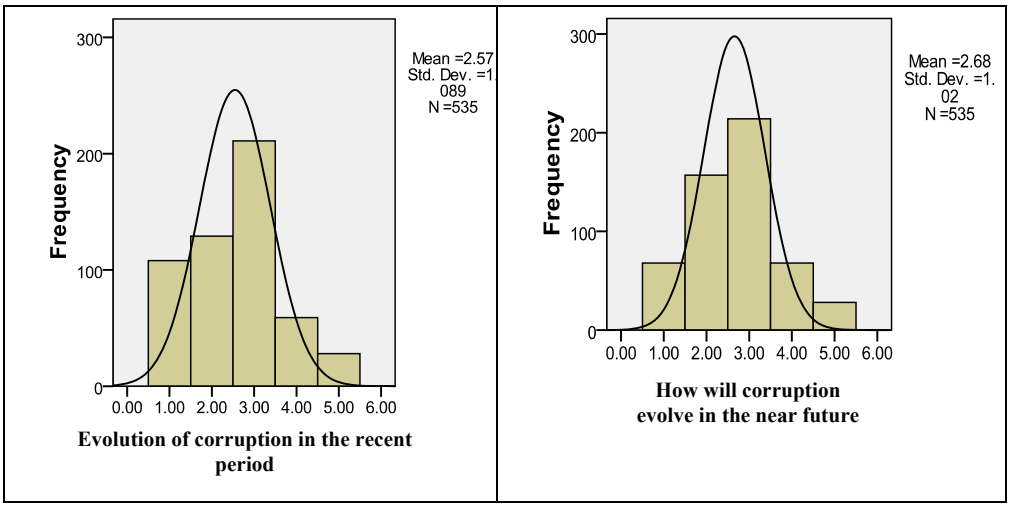

Figure 4. *Distribution of the values of the PCT and AVV variables*

The means and the standard deviations for the two variables are calculated. The results are:

- for the PCT variable the mean level is 2.57 and the standard deviation is 1.089;
- for the second variable a mean of 2.68 and a mean square error of 1.02 were obtained.

In order to evaluate the optimism of public administration employees with regard to the dynamics of corruption, the OPC aggregate variable is defined based on the following application:

$$OPC : N \rightarrow [-4,4],\ OPC = PCT - AVV$$

The distribution of the values of this variable is presented in the graph in Figure 5. The mean level of the variable is -0.11 and the standard deviation is 0.750. The mean level of this variable indicates a relatively favourable opinion with regard to the reduction of corruption as compared to the level reached in the past period. Nevertheless, it is worthy of mention that more than 65% of the persons interviewed think that there won't be a significant change in the level of corruption in the future as compared to the past period.

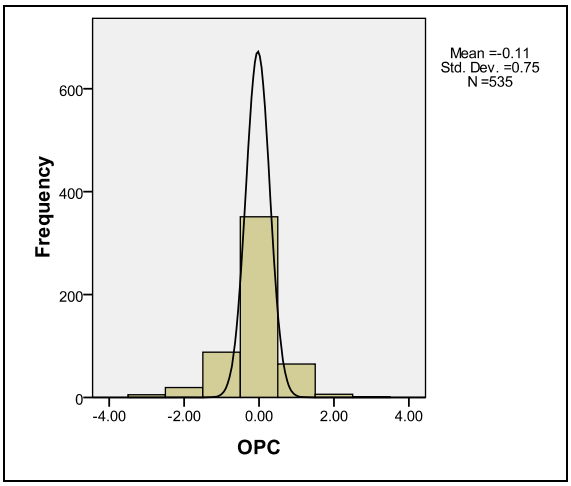

Figure 5. *Distribution of the values of the OPC variable*

6. Impact of corruption on important areas of activity

Question 5

What do you estimate to be the current influence of the level of corruption on the results in the following areas:

	Negative	Moderately negative	No influence	Moderately positive	Positive
1. Development of your locality					
2. National development in general					
3. Education					
4. Health					
5. Politics					
6. Local public administration					
7. Central public administration					

Based on the information obtained from the questionnaire, seven primary variables on the effects of corruption on the following areas are defined:

1. local development: $G_{51} : N \to \{1,2,3,4,5\}$;
2. national development: $G_{52} : N \to \{1,2,3,4,5\}$;
3. results in the education system: $G_{53} : N \to \{1,2,3,4,5\}$;
4. quality of services in the education system: $G_{54} : N \to \{1,2,3,4,5\}$;
5. politics: $G_{55} : N \to \{1,2,3,4,5\}$;
6. local public administration: $G_{56} : N \to \{1,2,3,4,5\}$;
7. central public administration: $G_{57} : N \to \{1,2,3,4,5\}$.

In order to define the seven variables, a measurement scale with five values was used: 1 – the effect is negative, 2 – the effect is moderately negative, 3 – there is no influence, 4 – the effect is moderately positive and 5 – the effect is positive.

The distribution of the values of the seven variables is presented in Table 6.

Table 6

Distribution of the values of the G_{51},…, G_{57} variables

Variable		Employees' assessments				
		Negative		No influence	Positive	
	NR	1	2	3	4	5
G_{51}	0.4	28.2	38.4	20.2	11.3	1.5
G_{52}	0.4	45.1	33.4	10.4	8.0	2.8
G_{53}	0.7	33.0	43.0	12.2	8.0	3.0
G_{54}	0.4	38.2	38.8	11.1	8.2	3.3
G_{55}	0.7	51.0	28.2	8.0	6.7	5.4
G_{56}	0.4	31.5	43.8	13.0	9.1	2.2
G_{57}	0.4	40.1	36.2	10.9	9.3	3.2

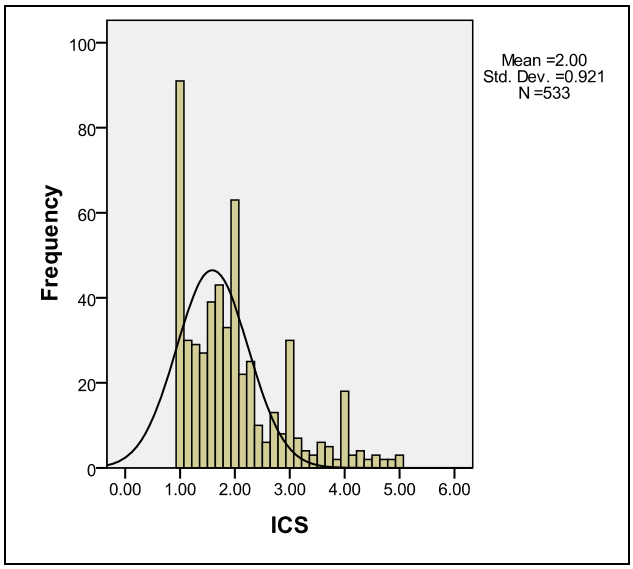

Figure 6. *Distribution of the values of the ICS variable*

For an overall evaluation of the effects of corruption on economic and social processes, the ICS variable is defined – the effects of corruption on the economic and social environment, as an arithmetic mean of the seven primary variables. This variable is defined based on the application below:

$$ICS : N \to [1,5],\ ICS = \frac{1}{7}[G_{51} + ... + G_{57}]$$

The means, the standard deviations and the indicators used to analyse the form of the distribution for the seven primary variables and the ICS aggregate variable are presented in Table 7. The evaluation of these indicators was made based on 533 individual values. A mean value of each variable below 3 shows a negative effect of corruption on each sector or on economic and social processes.

Table 7

Indicators that characterise the variables used to measure the impact of corruption on some areas of activity

	Variables							
	G_{51}	G_{52}	G_{53}	G_{54}	G_{55}	G_{56}	G_{57}	ICS
Mean	2.2	1.9	2.0	2.0	1.9	2.1	2.0	2.0
Standard deviation	1.020	1.054	1.022	1.064	1.153	1.003	1.082	0.921
Skewness	0.600	1.202	1.050	1.114	1.387	0.947	1.072	1.129
Kurtosis	-0.385	0.771	0.680	0.632	1.033	0.423	0.411	0.783

7. Contribution of some elements to the reduction of corruption

The level of corruption can be reduced through actions carried out by various institutions. The following factors are mentioned in the study: mass media, school, church, state institutions qualified to fight against corruption, the behaviour of central level politicians, the behaviour of local level politicians, the behaviour of the state's representatives/civil servants working in central public administration, the behaviour of local level civil servants, citizens' behaviour. For each institution a variable measuring the opinions of administration employees on the contribution of the institution concerned to the reduction of corruption is defined.

In order to define these variables, a measurement scale with five values was used: 1 – the effect is negative, 2 – the effect is moderately negative, 3 – the effect is null, 4 – the effect is moderately positive, 5 – the effect is positive.

The distributions of the variables obtained after processing the data series that include 533 values are presented in Table 8.

Table 8

Distribution of the values of the G_{61},…, G_{69} variables

Variable		Employees' assessments				
		Negative		No influence	Positive	
	NR	1	2	3	4	5
G_{61}	0.2	9.6	13.2	11.3	41.7	23.9
G_{62}	0.4	5.2	14.5	29.7	29.7	20.6
G_{63}	0.4	5.9	9.1	37.1	23.6	23.9
G_{64}	0.4	5.8	12.6	19.5	41.7	20.0
G_{65}	0.6	25.5	23.0	20.3	20.4	10.2
G_{66}	0.7	18.7	25.2	21.5	22.8	10.9
G_{67}	0.6	8.7	25.2	28.2	25.6	11.7
G_{68}	0.2	5.2	20.6	31.2	25.8	17.1
G_{69}	0.4	5.2	21.0	28.8	28.0	16.7

For an overall evaluation of the role played by the nine elements in the reduction of corruption, the RCF aggregate variable is defined as an arithmetic mean of these nine elements:

$$RCF : N \to [1,5],\ RCF = \frac{1}{9}[G_{61} + ... + G_{69}]$$

A mean value of this variable below 3 indicates a negative contribution of the nine elements to the fight against corruption.

The distribution of the RCF aggregate variable is presented in the graph in Figure 7.

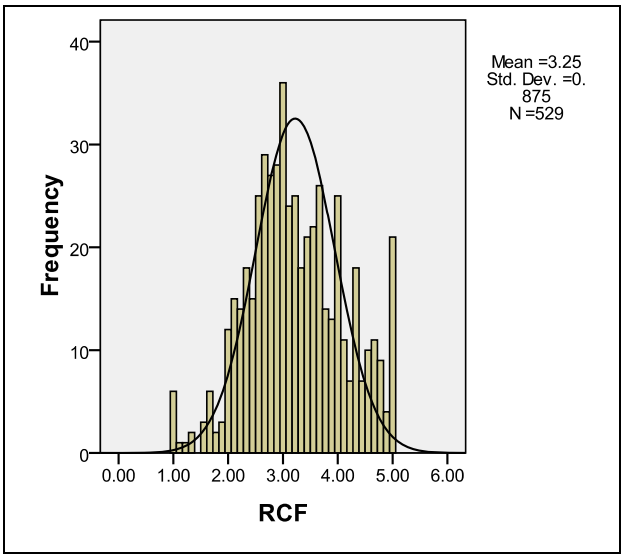

Figure 7. *Distribution of the values of the RCF variable*

The means of the nine primary variables and of the aggregate variable are presented in Table 9.

Table 9

Indicators that characterise the form of the variables used to measure the contribution of some factors to the reduction of corruption

	Variables									
	G_{61}	G_{62}	G_{63}	G_{64}	G_{65}	G_{66}	G_{67}	G_{68}	G_{68}	RCF
Mean	3.6	3.4	3.5	3.5	2.6	2.8	3.1	3.3	3.3	3.2
Standard deviation	1.25	1.13	1.13	1.12	1.33	1.29	1.16	1.13	1.13	0.87
Skewness	-0.74	-0.32	-0.32	-0.67	0.23	0.12	0.01	-0.09	-0.13	0.87
Kurtosis	-0.53	-0.64	-0.48	-0.27	-1.15	-1.12	-0.87	-0.82	-0.83	-0.36

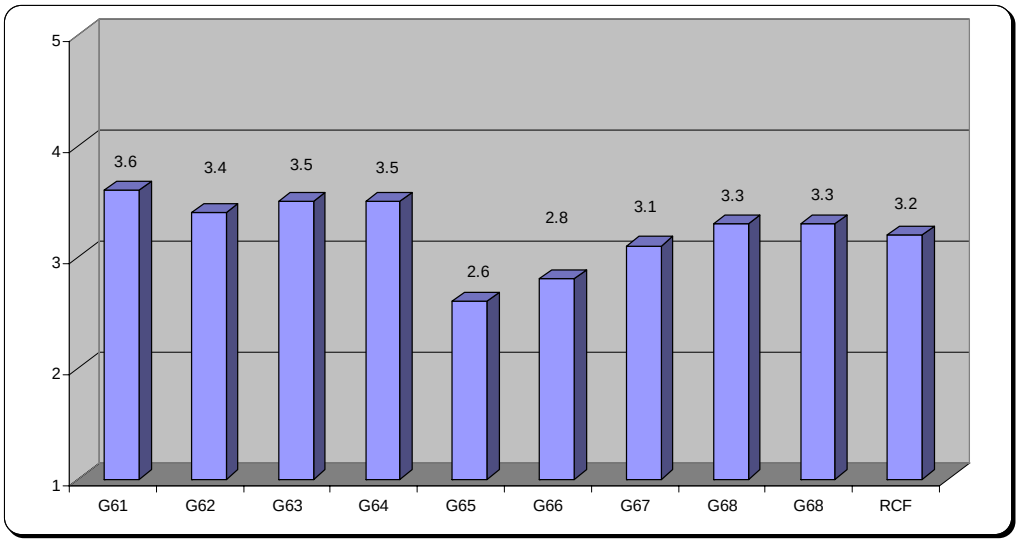

Figure 8. *Mean of the variables used to measure the contribution of some factors to the reduction of corruption*

The results obtained above enable us to make the following observations:

- the largest contribution to the reduction of corruption is made by the mass media. Following closely behind are the church and the institutions qualified to fight against corruption;
- at the other extreme there are the central and local level politicians who are regarded as favouring corruption;
- the civil servants working in central public administration have a neutral position in the fight against corruption.

8. Characteristics of public procurement and its impact on corruption

The evaluation of public procurement is made in relation to the following four elements:

- the way in which the public procurement process is conducted;
- the prices of the products and services purchased;
- the public procurement control system;
- the analysis of the complaints related to public procurement.

For the evaluation of the degree of satisfaction with each of these elements, a primary variable is defined using a measurement scale with five values: 1 – total discontent, 2 – a low degree of satisfaction, 3 – a moderate degree of satisfaction, 4 – a pretty high degree of satisfaction and 5 – a high degree of satisfaction.

The distributions for the four primary variables are presented in Table 10.

Table 10

Evaluation of the public procurement system on the basis of four elements

Variable	Degree of satisfaction					
	High	Pretty high	Moderate	Low	Total discontent	NR
D_{41}	7.8	7.4	38.0	25.0	21.3	0.4
D_{42}	7.8	12.6	38.4	25.2	15.4	0.6
D_{43}	8.7	10.0	34.0	27.3	19.5	0.6
D_{44}	9.6	15.8	30.8	26.7	16.3	0.7

For an overall evaluation of employees' degree of satisfaction with the public procurement system, the ESA aggregate variable is defined as a mean of the four primary variables:

$$ESA : N \to [1,5],\ ESA = \frac{1}{4}[D_{41} + ... + D_{44}]$$

For the primary variables and the aggregate variable, the mean level is calculated based on 535 individual values.

Table 11

Indicators of the variables used to characterise the public procurement system

Variable	Mean	Mean square error
D_{41}	3.4	1.140
D_{42}	3.3	1.112
D_{43}	3.4	1.165
D_{44}	3.2	1.190
ESA	3.3	1.046

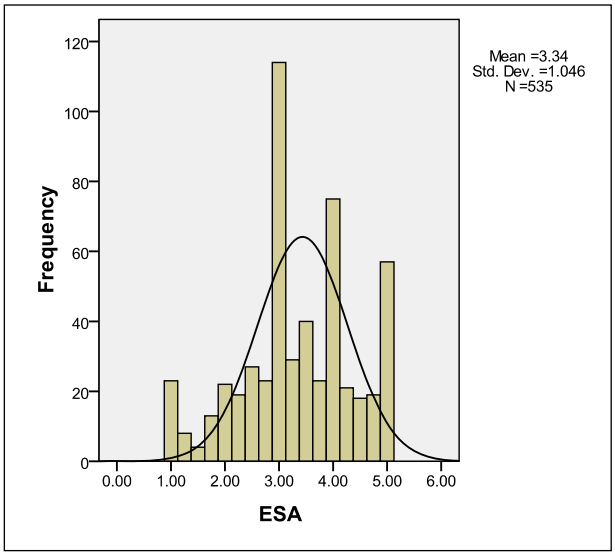

Figure 9. *Distribution of the ESA variable*

In order to evaluate the extent to which the current public procurement system induces corruption in the system, the following primary variable is defined:

$$D_5 : N \rightarrow \{1,2,3,4,5\}$$

In order to define this variable, a measurement scale with five values was used: 1 – the public procurement system induces corruption to a high extent, 2 – it induces corruption to a pretty high extent, 3 – it induces corruption to a moderate extent, 4 – it induces corruption to an insignificant extent and 5 – the current public procurement system does not induce corruption in the system. The distribution of the values of the D_5 variable is presented in Table 12.

Table 12

Distribution of the variable used to characterise the extent to which the public procurement system induces corruption in the system

(%)

Extent to which it induces corruption	Frequencies	Upward cumulated frequencies
To a high extent	8.9	8.9
To a pretty high extent	19.1	28.0
To a moderate extent	27.3	55.3
To a low extent	26.7	82.0
Not at all	16.9	98.9
NR	1.1	100.0

The graph in Figure 10 presents the distribution of the values of the above defined variable in order to evaluate the extent to which the current public procurement system induces corruption in the system. The mean of the variable is 3.2, and the mean square error is 1.205.

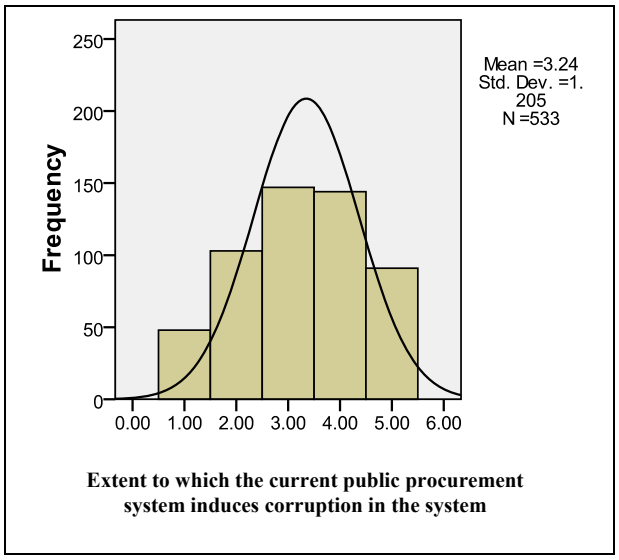

Figure 10. *Distribution of the values of the D_5 variable*

For the seven primary variables the mean level is calculated as a measure of the capacity of each professional category to induce corruption in the public procurement system. The means and the standard deviations are presented in Table 13. In order to calculate these indicators, 528 individual values were used.

Table 13

Statistical indicators for the D_{61},...,D_{67} variables

Indicator	Variable						
	D_{61}	D_{62}	D_{63}	D_{64}	D_{65}	D_{66}	D_{67}
Mean	3.3	3.1	3.1	3.1	3.2	3.9	4.0
Standard deviation	1.44	1.46	1.43	1.42	1.30	1.09	1.02

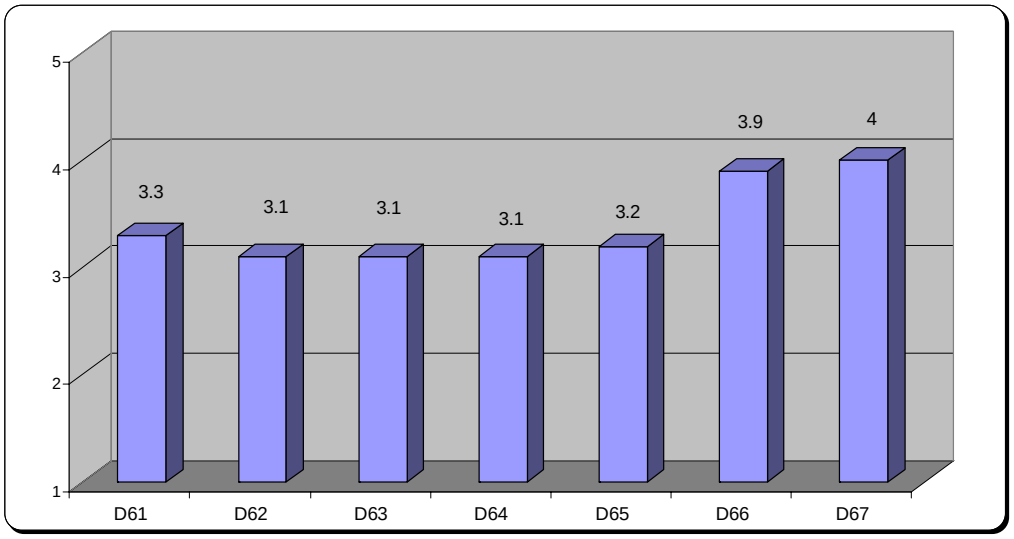

Figure 11. *Means of the variables used to evaluate the extent to which certain categories of persons can induce corruption through public procurement*

9. Conclusions

In order to obtain the statistical data, a statistical questionnaire was applied to a representative sample. This paper presents a series of statistics related to important aspects of the corruption phenomenon. Focus was placed on the following issues: measuring corruption at the level of some sectors of activity and at the level of the institution where the public administration employee who responded to the questionnaire works; identifying important factors that contribute to the growth of corruption; evaluating administration employees' degree of trust in the possibility of corruption being reduced within a definite time horizon; estimating the effects of corruption on important areas of activity; the extent to which certain elements contribute to the reduction of corruption; identifying certain characteristics of the public procurement system and the extent to which they contribute to the reduction or growth of corruption.

In the opinion of public administration employees, the level of corruption is still very high. Some of the most important contributing factors are the salary system, the pressure exerted by the political system and the legal framework. A series of institutions such as the mass media and the church have contributed to the reduction of corruption in society. Conversely, the behaviour of politicians has contributed to a still high level of corruption. Public procurement represents another important source for the spread of corruption.

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