The corruption - an economic and social analysis

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Foreword

The current edition in English language turns into account and completes the studies published in the previous edition. Carrying on the research and publication activities on the topic of corruption is based on its novelty and on the special interest for the Romanian language edition.

At the same time, we hope that the current volume will provide greater opportunities for foreign access and thus the admittance in the European and international flows of information in this field.

The core ideas of the book focus on social perception, modelled through statistic analyses, on the specificity of corruption in the public administration or the public health system in close correlation to the processes of decentralization and performance of health services.

The analysis of the corruption topic is in interference with the effects of the European integration processes, globalization, being correlated to adjacent developments concerning the public integrity, national or regional economic freedom and development.

This book represents the result of the scientific collaboration between teams of teaching staff and students from the National School of Political Studies and Public Administration and Academy of Economic Studies, Bucharest.

The book is structured on nine chapters, organised according to a didactic logic, in view to provide the reader a profound overview of the mechanisms and methodology of research as well as the conclusions and the economic and social impact of corruption.

Data processing in view to estimate the correlations and parameters of regression has been achieved through SPSS and Eviews statistic programs.

The authors will be grateful to all those who will formulate remarks, comments or suggestions for improving the content of the book.

23 July 2009 *The authors*

Chapter 1

Introduction to the Study of Corruption

1.1. General Aspects Connected to the Corruption Phenomenon

Analysis of corruption is an important field in contemporary economic research. In the recent years, researchers and university professors, as well as international organizations, such as the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD) have been particularly concerned with the study of corruption levels, trying to identify its causes and the mechanisms of transmission of corruption through a system. The main issues in studies on corruption are those connected to defining and measuring corruption levels, identifying causes and mechanisms of its transmission throughout the system and measuring corruption effects on the economic and social environment in a country or a development region.

The choice of the most appropriate index for measuring corruption levels, and ensuring its universal validity is one of the most important issues in this particular field of research. The literature of specialty uses a series of indices and ratios for corruption levels measuring, each of them expressing a certain

aspect of the corruption phenomenon, for a number of selected countries and for different lapses of time. One of the first indices used in corruption measuring was published in International Country Risk Guide (ICRG). Many firms consult data published by ICRG, when they want to take decisions on making their investments and developing their businesses throughout various regions of the world.

The second index used in measuring the level of corruption is the Corruption Perception Index, published yearly by Transparency International (TI). The third index, Corruption Control (CC), was proposed by Kaufmann, Kraay and Mastruzzi, (2003) and proposes other strategies of aggregating indices measuring corruption, than those used by Transparency International. We must also mention the fact that other institutions or organizations use some other methods for measuring corruption, than those already explained.

One of the issues difficult to analyse is to identify the causes causing corruption to appear in a public system. Literature of specialty identifies four categories of factors directly influencing corruption phenomena within a system: political and juridical factors, historical, social and cultural factors and economic factors.

Within the first category of factors we include the quality of the political system, the particular features of the juridical system (see Leite and Weidmann – 1999); especially the legislation and the institutions having the mission to fight corruption in a given country, the quality of the democratic system, the features of the election system in a given country, the type of administrative institutions, the degree of de-centralization of the system, and so on.

A series of studies, such as those written by La Porta (1999), Treisman (2000), or Alesina (2003) show that traditions and cultural factors of a country have a strong impact on the level of corruption and on mechanisms enabling its transmission throughout the system.

Social and cultural factors play a special part in identifying levels of corruption of a country, according to La Porta – 1999,

Treisman (2000) and Alesina (2003). Equally, religions factors have their impact in propagating corruption within a social system.

Economic factors, such as the level of openness of economy (see Dreher – 2003, Treisman – 2000 and Wei), the size of the public sector within an economy (see Tanzi – 1998; Treisman – 2000), the level of remuneration in the public sector (see van Rijckeghem - 1997), have a direct impact on the levels of corruption within a country.

The choice of the most adequate econometric models in estimating corruption levels and its effects on activity sectors. Among the most appropriate econometric models for measuring corruption consequences on the economic and social environment, we mention: the general models of economic growth, explained by Mauro (1995), Abed and Davoodi (2000), and Krueger (1974); the models of economic growth of some particular sectors within national economies (see Tanzi - 1998; Shang-Jin Wei - 2001); the effects of de-centralization processes on levels of corruption and types (see Shah - 2000); the quality of financing systems in certain fields, such as the military sector, (see Gupta - 2000); the effects of remuneration systems in public sectors, on levels of corruption (see van Rijckeghem and Weder, 1997); the industrial policies of a given country (see Emerson - 2002; Bhagwati - 1982) and the efficiency of investments (Sarkar - 2001; Mauro - 2002). Most of the studies mentioned above use, in order to measure the impact of corruption on economic or social fields, at national, sectorial or regional levels, models of linear regression, VAR models, analysis of co-integrated series, and so on. Kaufman (1999) and Andrei (2008) propose models of simultaneous equations. In this case, the variables of the models are exogenous or endogenous, and parameters are estimated by the method of the smallest least squares (TSLS) and the general method of moments (GMM). These methods take into account the endogenous or exogenous character of every variable within the mathematical model. In applying the above mentioned models, mention should be made of the fact that specialty studies in the field do not offer a convenient approach on the choice of variables used for estimating parameters

of models with simultaneous equations, in the study of corruption levels in a public sector (see Bai and Wei - 2000; and Kaufmann, Kraay and Zoido-Lobaton - 1999).

Among the most prominent classic studies in this field of research, we shall mention A. Krueger (1974), S. Rose-Ackerman (1975) and so forth. The lapse of time that followed political and economic changes occurring in Eastern Europe after the fall of the socialist regimes, conducted to new forms of corruption, more refined, and to more sophisticated ways of propagating it into the new, changing social systems. The situation of these countries stimulated new research studies in the field, the more so as the IBRD (International Bank for Reconstruction and Development) - 2001, identified the phenomenon of corruption as "the only serious obstacle in the way of economic and social growth and development". A series of important studies were published during this period of time, especially of quantitative methods used in corruption measuring. Among the most prominent studies, published in the nineties, we quote studies by P. Mauro - 1995; P. Bardhan, 1997; V. Tanzi- 1998; Shang-Jin Wei - 1997 etc. Presently, there is a set of parameters measuring corruption levels in economies, generally accepted as valid. The best known is the index used by Transparency International, published yearly.

For the case of Romania, a series of estimations of the levels of corruption and its consequences on the administrative reform were made in the study analyses by T. Andrei (2007), M. Profiroiu (2007), and Teodorescu (2007a); Studies on corruption phenomena in Romania Universities were made by Teodorescu (2006, 2007b) and studies on effects of corruption in financing some activity sectors were also signed by T. Andrei (2002) and A. Matei (2007).

1.2. Corruption and performance in higher education

If the phenomenon of corruption exists in a country, it will propagate into the educational system and especially in higher education and universities (see Rumyantseva, 2002). The types of corruption, the levels of propagating it and its consequences in this

particular system, and the results at the society level, are different (see Rumyantseva, 2005). Corruption in educational systems causes problems connected to financing of schools from public money, if we speak about corruption at the level of education ministry, or about the institutions responsible for the financing and administration of an educational system – but it can also have a direct impact on young generations of students, on their system of values, and on the cultural models of a country or of a region, if we consider corruption facts directly connected to students' life. These consequences cannot be measured directly, on short term, but they can have very serious impacts on lowering the standards of education in the long run, in decreasing economic competitiveness, especially in those education fields where corruption phenomena are present and obvious. According to a study of the World Bank (2003), made in Kazakhstan, the correlation ratio between quality perception in education and education as such is – 0,27%.

In the field of higher education, in countries in transition, there are no studies or analyses to examine the general level of corruption in the educational system, or its specific features. According to Chapman study, quoted by Rumyantseva (2005), corruption in the educational field can be seen at the following levels: the Ministry of Education, the regional levels in a country (territorial departments or counties), educational units, the relationship between pupils and teachers, and international agencies. If we try to adjust this index to higher education institutions, we can identify the following levels where corruption phenomena may appear: the Ministry of Education and government agencies having the responsibility to issue rules of functioning, to finance and to supervise financing activities for higher education institutions; the relationship between professors and students, the Boards of universities and faculties, and also at the level of international agencies within higher education field.

At the first level, corruption doesn't imply the direct relationship student-professor, the ways of its propagation being the same as in any type of ministry. At the second level, of the Boards of universities and faculties, students do not participate

directly in corrupted activities. Students can explicitly participate in corruption acts only the third situation, i.e. the direct relationship student-professor. If, in the first two cases, the effects are perceived by inefficient expenditure of funds, lowering the standards of education process and also of the prestige of the universities, at the level of society as a whole, the third situation, where students benefit from corruption acts, causes effects that are difficult to measure and have very serious consequences in the long run.

As a matter of fact, one of the specific features of corruption acts in this particular field, is the way in which if manifests its consequences on the economic and social environment in the medium and long run. If, in administration or in other fields of activity corruption causes immediate effects, by lowering efficiency of public money expenditure, in higher education environments its consequences are even more dramatic in the medium and long run, because it modifies the attitudes at the level of ethics and morality for large groups of persons. Thus, it is difficult to think that a student who took his exams mostly by frauding, will later have a correct and fair attitude in his job, or in developing his future businesses.

Analysis of corruption is recommendable because of the following reasons: (i) at present, there is no methodology or indices for measuring corruption levels in various sectors of activity. Civil society and various international bodies have a negative perception on a series of activity sectors, such as: justice, administration, public health, public education, public administration, but there are not standards of measuring corruption size in these fields. This is why it is necessary to develop an adequate system of indices, and a subsequent methodology, appropriate for each and every sector, in order to work out efficient mechanisms for fighting corruption. (ii) Annual reports of the European Commission underlined the necessity for Romania to continue the de-centralization process. By using techniques of simulation, it is advisable to estimate levels of corruption in the above mentioned domains. We should also bear in mind that by

decentralization processes, a series of mechanisms generating corruption phenomena can be transferred from central levels to local levels. (iii) There is not yet a model of quantitative analysis of corruption consequences on economic and social development at regional and national levels. This is why econometric techniques or models can estimate a series of corruption consequences on economic and social development of a region, a sector of activity or of a country.

1.3. Corruption phenomenon and the decentralization process

Decentralization can have multiple forms, depending on the nature of functions which are decentralized, depending on the type of control made by local authorities on these functions and on the type of institutions where these responsibilities are devolved.

In developing countries, objectives of the decentralization process are generally focused on increasing efficiency, fairness, accessibility and good quality of the services provided by the organizations concerned, as well as on the way in which local needs are covered. In fact, de-centralization is directly connected to both economic development of an area, and to the democratic systems of governance.

By de-centralization we try to improve performance in providing a certain type of service, by changing types of authority and responsibilities between key actors, improving information flows on the basis of which decisions are made, improving performance estimation indices, setting up mechanisms of accountability for fulfillment of tasks, and finding motivation means for all actors participating to the tasks process (see Paul L. Hutchinson – Monitoring and evaluation of Decentralization Reforms, 2004).

One mechanism for evaluating changes at the moment when responsibilities are passed from one organization to another is the "responsibility framework" (see Brinkerhoff (2003), Aucoin and Heintzman (2000). These changes, applied in a consistent and

coherent manner will implicitly lead to diminishing levels of corruption phenomena in the public system.

During the last decade, Romania made important footsteps in financial de-centralization, but the process of implementing this policy was hindered by the absence of a national strategy of de-centralization. Within the process, three cycles could be identified. During the first cycle, (1991-1994), important changes in the structure and financing of local authorities were made, also including a local taxation system. During the second cycle of administrative reform (1998-2000), new steps were made in the reform of administrative and financial decentralization process. Thus, on the basis of a new legislation on financing local public authorities (amendments were made to Law no. 69/1991 and Law 189/1998 on local public finances), the share of the GNP allotted to local budget increased; also, the share of local budgets in the overall amount of public expenditure increased: (from 1998 to 2001, the percentage of the GNP allotted to local public expenditure increased from 3.6 per cent to 6.5 per cent and local public expenditure increased from 14.4 per cent to 26.6 per cent). During the third cycle (2001 to the present) the new laws and rules set up new standards for certain positions of local authorities, especially in public services, utilities (see Law no. 215/2001 on local public administration; Law no. 326/2001 on public services of town administration; GO no. 86/2001 on local public transport for persons; GP no. 84/2001 on public statistics of the number of persons in a community; GO no. 88/2001 on community public services for emergency situations; GO no. 202/2002 on integrated administration of coast line; GO no. 21/2002 on administration of urban and rural communities; GO no. 32/2002 on public services of water supply and sewage; GO no. 71/2002 on administration of public and private assets of local interest.

Corruption phenomena, as well as an incoherent and inconsistent model of de-centralization caused a serious diminishing of funds for every state, as well as lower standards of efficiency in the expenditure of public funds. In this context, (i) setting up an appropriate index of standards for measuring the

levels of corruption and the subsequent methodology, (ii) setting up an efficient mechanism of implementing services de-centralization, (iii) evaluation of consequences of corruption and of decentralization on public services, as well as (iv) ensuring transparency in public money expenditure, represent top priorities for all Member States of the European Union and for all candidates to membership.

Recommendations made by the European Commission and by the World Bank are major priorities of Romania's process of integration, and they all focus on reducing corruption levels and continuing de-centralization processes.

1.4. A methodology of analysis of corruption

The approach mentioned above not only tries to effectively measure corruption levels, but also to identify mechanism causing it. Thus, our approach brings forward a series of new ways of data collection, statistics and econometry tools in working with databases, and with the domain of the specified subject, consultation of the main actors who evaluate corruption levels, and its consequences on economic and social fields.

The most important elements in the methodology of corruption measuring, are data collection, statistics, econometric and macro-economic techniques used in identifying and measuring corruption phenomena, the performance of the public systems, the economic and social development at national and regional levels, the type of informatics systems used in creating data bases and working with them. The following pages will treat pertinent elements connected to these aspects:

The choice of the most adequate methods of data collection for estimating parameters of the econometric models that characterize aspects connected to levels of corruption, the relationship between corruption and performance in the public sector, the relationship between levels and types of corruption and the degree of satisfaction offered to the clients of services supplied by an institution, the impact of corruption on regional

development, and so on. The series of data used in estimation parameters and in working out economic analyses were mainly obtained by the technique of statistical sampling, by treatment of data gathered in public institutions documents, by methods of simulation of econometric models.

The technique of statistical sampling was applied at the level of a few target populations. Thus, a series of specific methods were used, among which we mention: estimations using auxiliary information and complex plan, estimations of variance by linear modeling, and so on. In this respect, we used specific methodologies proposed by Cochran, W, *Sampling Technique*, 3rd edition; Wiley, New York, 1977; Soon, R, *Practical Sampling Techniques*, Wiley, New York, 2004; Dumitrescu, M: *Statistical sampling and applications*, Ed. Tehnică, Bucureşti, 2000. Statistical tools used in the measuring of performance at the level of a sector or at the level of a region, as well as for measuring corruption characteristics were first tested in a pilot phase. The method of data collection from representative samples of people was the statistical inquiry. Questions asked in the questionnaires were edited by the team members, after investigating specialty literature, discussions with experts in statistics, in corruption analysis, de-centralizing, services quality, regional development, education, and so on.

Working with statistical data collections existing in various types of institutions, national or international represents an important source of information in analyzing the consequences of corruption on economic, social and political fields. Thus, in order to estimate parameters of econometric models, the necessary data can be obtained from: i) The National Institute of Statistics (INS), the National Bank of Romania (BNR), the International Bank for Reconstruction and Development (IBRD), the OECD, and so on, provide data on macro-economic development and regional development; data on corruption can also be obtained from Transparency International and IBRD.

Statistical Methods of Simulation of Econometric Models. In this type of analysis, a series of classical techniques of simulation

can be used, such as those proposed by Monte-Carlo, Gibbs, but also simulations on the basis of non-parametric Bayesian inference. Of great help working with these techniques, can be studies written by Congdon P., "*Bayesian Statistical Modelling",* (Wiley Series in Probability and Statistics), Wiley, New York, 2007; Greenberg, E., *"Introduction to Bayesian Econometrics",* Cambridge, 2007; West, M., Harrison, P.J., *"Bayesian Forecasting and Dynamic Models",* 2nd edition, Springer-Verlag, New York, 1997; Favero, C., *"Applied Macro-econometrics",* Oxford University Press, 2001.

The Choice of Statistical, Econometric and Macro-economic tools for analysis of corruption characteristics, performance of public systems and economic and social development at national and regional levels. In this area of analysis, the following categories of tools are used: (i) for data processing, a series of statistical methods, such as: the method of grouping, the method of regression, non-parametric methods, data analysis methods, and so on. In Romanian speciality literature, there are books treating these topics, such as: Isaic-Maniu, Al. *"Statistics for Businesses Management"*, 2nd edition, Ed. Economica, Bucharest, 2000; Jaba, E., *"Statistics"* Ed. Economica, Bucharest, 1998; Andrei, T., *"Statistics and Econometrics"*, Ed. Economica, Bucharest, 2003. (ii) Econometric tools used in working with longitudinal series: because a correct estimation of parameters play an important role in understanding mechanism of corruption propagating and taking into account the very special character of these series of data, we use Kalman type philters, described by Dejong, Ingram and Whiteman (2000); Chari, Kehoe and McGrathan (2004) and Clement and Hendry (1998); the above mentioned authors propose new and more refined models of Box-Tiao method (1976), for the analysis of the variance of parameters in a model and of treating points of change in a series of data. (iii) *Econometric tools for measuring the impact of corruption at national levels, or at the level of an activity sector*. Thus, a group of methodologies applied in international literature in the analysis of data series will be adjusted, by introduction of a new set of variables measuring

corruption and its characteristics, and by measuring the performance of a public sector. In a classic approach, models are defined on the basis of variable elements and relationships between them, which more often than not, are submitted to apriori restrictions not justified from the statistics point of view (see Pesaran, 1988). Because of this criticism, the paper proposes the use of VAR models, who were much improved and refined by the applications in which they were employed. Thus, models derived from the original model, make possible an estimation of multiplied instantaneous and dynamic effects for various economic parameters: (1) Sims (1992), Leeper, Sims, Zha (1996), Christiano, Eichenbaum and Evans (1999) are making measurements of the surprising effects of monetary policy on real economy; (2) Blanchard and Quah (1989), Gali (1999), Christiano, Eichenbaum and Vigfusson (2004), are making estimations on the impact of the technological shock on real economy; (3) Blanchard and Perotti (2002), Favero (2002) and Biau, Girard (2004), are making estimations on consequences of taxation and budgeting policies. In their approach, theoretical papers on econometrics are classified as follows: (a) techniques and methods for analysis of stationary processes (self-regressive models, VAR – type models, and derivated models); b) econometrics of non-stationary processes (statistical tests, HP philters, BN philters, theory of co-integration and Johansen approach, theory of rational forecastings and the model of correction of errors, the approach proposed by Hendry, and so on); c) econometrics of non-linear processes and of long memory processes (ARFIMA – type of processes, see Robinson, 2004). The stochastic model of the general inter-temporal equilibrium conducted to a series of developments in subsequent econometrics studies, such as those written by Favero and Rovelli (2003), Del Negro (2005), ensuring a better explanation of series of time with macro-economic content, as well as better quality economic forecastings. Among latest approaches in this field, we quote the bayesian approach (see Favio, 2007). In this particular field of research, calibrating of models is a major point (see Dawkins, Srinivasan and Whalley, 2001).

The choice of the best suited informatics means for the creation of data bases and for the processing of these data. Taking into account the specific aspects of collecting series of data necessary to analyses and also the characteristics of econometric and statistical tools, the following informatics programs will be used: SPSS, EViews and Statistics.

The choice of the best techniques of consulting important actors in the field of interest of the project proposal. In this particular area of the study, the following points will be approached: (i) A correct choice of target-populations analysed by the statistical sampling. In order to measure the level of corruption, its causes and its consequences, several groups of people will be under survey. For instance, if the subject of the pilot study is the field of higher education, then the following target groups will be defined and measured: students, teaching staff and professors, administrators of higher education universities (chiefs of departments, Deans and their deputies, Rectors, other positions with management responsibilities); employees in ministries and governmental agencies with responsibilities in the area of higher education; representatives of some NGO-s who have higher education field as objective of their work. (ii) *The correct choice of the consulting methods*: In this stage, the following methods will be used: the statistical questionnaire, the round tables and meetings with important actors in public organizations, and so on.

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Chapter 2

A few Characteristics of the Reform Process in Romania's Public Administration

2.1. Introduction

In order to be accepted into the European Union, Romania had to operate an important process of reforming its public administration. To this aim, Romania benefited of a financial and technical support through Phare project "*Support for a project of strategy in reforming public administration*".

According to the Strategy of the Reform, issued in 2004, a reform in administration is a process of transforming public administration – central and local – so as to meet the requirements of its customers and the requirements of the integration of Romania to the structures of the European Union. From this point of view, three components of the reforming process were identified: (i) a reform of the civil service, by improving the management of the civil service and the continuous training of civil servants; (ii) a reform of the local public administration, by continuing its decentralization process; (iii) the improvement of the process of defining and applying public policies.

The strategy of the reform was implemented from 2004 to 2006, and for the support of the reforming actions were supplied financial funds from the state budget and from foreign projects, mainly European funded projects through Phare multi-annual programme, 2004-2006, or the Programme PAL of the World Bank. Financial resources, distributed for the three main components mentioned above, are: (i) 7 200 thousand € for the civil service reform. To this amount, we must add 13 937,6 thousand €/per year for the training in the following three years of the following categories of personnel: 100 top civil servants, by programmes of specialization of one year; 150 young professionals by courses of specialization of one year or two years; 3000 persons already holding top management positions, in courses of specialization of one year and 9000 middle-management positions, in courses of specialization of three months each. (ii) For supporting local administration reform were supplied projects, funded either by Phare or by PAL project (the World Bank) amounting to 8 150 thousand €; (iii) For the third component of the reform process were allotted projects amounting to 8 150 thousand €. As a matter of fact, the financial support granted by the European Union for reforming public administration – central or local - from 1992 to the beginning of Phare multiannual programme 2004-2006, amounts to 42 000 thousand €. The value of Phare projects in multiannual programmes, supporting the implementation of the Strategy, amounts to 35 880 thousand €.

2.2. Statistical data processed

In order to measure the main characteristics of the reform in public administration, in May 2007, the public administration organized a research study using the statistical inquiries method. The research study defined a representative sample of civil servants working in public administration. In order to obtain the representative sample, researchers used a sampling technique in two stages, and the size of the sample was of 971 civil servants in central and local public administration. The possible error in the

estimation of parameters at the level of reference populations is of 1.2%, and the probability of obtaining correct results is of 97%.

At the level of the population under study researchers used a statistical questionnaire covering the following major points: type of organization of institutions belonging to public administration – central and local; the pressure put on public administration institutions by the political system; the process of decentralization in public administration, the civil service; the discrimination men/women at the level of obtaining a job in public administration; corruption and its consequences on economic and social development at local and national levels. The questionnaire used in the survey also had questions concerning personal aspects, such as: if the person is a man or a woman, his/her age, type of education, type of job and type of organization where he/she is employed. The persons included in the sample were staff and personnel working in central public administration, county councils, prefectures, and de-centralized public services.

2.3. Specific aspects of the reform process

The pages below present a series of particular aspects reforming public administration in Romania. The next chapters will approach characteristics connected to reforming civil service, ways of carrying on the de-centralization process, and corruption facts in public administration.

2.3.1. Knowing the goals, objectives and development strategy of the organization

In order to measure to what extent the civil servants are familiar with the objectives and the strategy of development of the organization where they are employed, the variable X_1 must be defined. This variable is calculated depending on three primary variables measuring to what extent employees know the goal, objectives and development strategy of their institution. The measuring scale starts from the minimum 0 – that is the situation where the employer considers it is not important for him to know

the goals, objectives and development strategy of his institution and measures all the values to a maximum value, $4-$most favorable situation, when the employee considers it is vital to him to know the goals, objectives and development strategy of his institution.

For this variable X_1, after the processing of data series supplied by the sample under survey, was obtained an average of 3.27 and a variance of 1.06. The medium level of this parameter shows a high degree of transparency in the public institutions, concerning the way civil servants are familiar with the development strategy of their organizations.

2.3.2. Budget performance in public institutions

In order to measure the budget performance in public institutions, a variable of second degree was defined, namely X_2, measuring the budget performance of the given institution, the way in which it observes the development programme and the budget allotted to it, the annual financial planning, and the efficiency of the activities performed by the given institution. The values taken by this variable are measured on a measurement scale from 0 to 4, corresponding to: 0 is the situation where the budget performance of the institutions are completely unsatisfactory and 4 is the situation where the budget performance of the institution are excellent. The average of this variable, 2.87 shows an opinion relatively satisfactory from the employees interviewed, on the budget performance of their institutions.

2.3.3. The capability of PA institution to maintain good quality relations with their beneficiaries/customers

For an overall estimation of the quality PA institutions maintain with their beneficiaries, the variable X_3 is defined. This variable is measuring the extent at which the personnel in P.A. institutions is acquainted with the needs and expectations of the beneficiary institutions, the capability of P.A. institutions to

consult their beneficiaries on the quality of the service they provide, and their willingness to accept suggestions from the beneficiary institutions. The values of the measuring scale are as follows: $1-$i.e. the situation when the relationship P.A. institution/beneficiary institution is very tense, up to $5-$i.e. the situation when the relation of the P.A. with the beneficiary institutions is very good.

The average level of this variable 3.77 shows a relatively good relationship of P.A. organizations with their beneficiary institutions.

In order to obtain an overall image of the quality of activities performed by P.A. institutions, another variable is defined, which takes into account the three above-mentioned variables: X_1, X_2 and X_3. This variable is defined as the arithmetical average of X_1, X_2, X_3, is symbolized as C_1 and takes values from [0 5].

Table 1 presents average figures and standard deviations for elements measured in order to assess the quality of activities performed by P.A. institutions. The table also presents the values of statistics F, calculated by ANOVA analysis, which measures the significant differences between various groups of employees in P.A. In this respect, the three following characteristics to define groups of P.A. employees were used: the type of institutions where the civil servant works, i.e.; CPA – central public administration; CC - county councils; P - Prefectures and DPS – de-centralized public services; category of personnel the person belongs to and his/her sex; (male/female); the position of the employee: management personnel (PC) or subordinated personnel (PE).

The values of this statistics, together with the significant differences between groups of employees interviewed, are given only for the situations where differences in the response of the groups interviewed are significant.

The scores obtained after the processing of data series lead to the following conclusions, as for P.A. institutions capacity to fulfill their basic functions: (i) in the opinion of the groups interviewed, P.A. institutions performance is good; (ii) the opinion

of the management personnel is better than that of the subordinated personnel; (iii) the male population interviewed has a much better opinion on their institution budget – performance, on the relation with beneficiary institutions, on its objectives, as compared to the female population; the value of the significant difference is $p < 0.02$ in all situations, less the parameter measuring the knowledge of the personnel on the strategy and objectives of their institution; situation in which the significant difference is $p < 0.09$;); (iv) the best opinion on this parameter is present among the employees of County Councils (CJ); (v) the subordinated personnel have a much lower opinion on the budget performance, than the management staff; moreover, their opinion is totally different from the opinion of their chiefs of departments. The same lower opinion is also expressed by the subordinated personnel of Central PA and Prefectures, on the above mentioned point.

As a matter of fact, the diagnosis analysis made for the Strategy of Reforming PA, shows the existence of financial restrictions in performing current activities and implementing measures recommended by the Strategy, an excessive concern of Ministries concerned for solving current activities and the lack of an efficient communication between Ministries; an insufficient planning of PA activities, since institutions are mostly concerned with day-by-day problems and do not spend time or resources for strategic, long run planning. As a measure aiming to increase the planning capacity of public institutions at the central level and at county level, in 2004, were adopted multi annual – programmes of modernization.

Table 1

Characteristics of variables used for assessing the quality of P.A. institutions performance

		X_1	X_2	X_3	C_1
Type of institution	APC	2.99(0.69)	2.51(0.93)	3.19(0.74)	2.90(0.60)
	CJ	3.08(0.58)	2.93(0.69)	3.45(0.55)	3.16(0.47)
	P	2.89(0.65)	2.48(1.16)	3.39(0.64)	2.92(0.57)
	SPD	2.99(0.70)	2.68(0.87)	3.34(0.72)	3.00(0.58)
Statistics *F* and value of *p*		-	3.396 (0.01)	-	2.540 (0.04)
Male/Female	M	3.07(0.65)	2.81(0.78)	3.44(0.64)	3.10(0.52)
	F	2.95(0.69)	2.62(0.94)	3.28(0.73)	2.95(0.50)
Statistics *F* and value of *p*		2.389 (0.09)	3.883 (0.02)	4.256 (0.02)	5.609 (0.01)
Type of personnel	PE	2.90(0.70)	2.56(0.95)	3.25(0.72)	2.90(0.59)
	PC	3.15(0.60)	2.94(0.71)	3.48(0.63)	3.19(0.49)
Statistics *F* and value of *p*		19.764 (0.00)	27.399 (0.00)	14.888 (0.00)	36.805 (0.00)

2.3.4. The System of Performance Assessment

In order to measure the quality of performance scored by PA institutions, two factors must be taken into account: the general characteristics of the system of evaluation of performance in the given institution and the evaluation of the personnel for the work performed in a lapse of time of 1 year. Thus, the variable X_4 is defined, assuming values from 0 to 4. The least value (0) shows a negative perception of the employees interviewed on the system their work is measured and 4 is a maximum value, showing full satisfaction of personnel on the way their work is evaluated.

The average score obtained by this parameter, 3.8 shows a good perception of the employees interviewed on the system of evaluation of performance in public institutions. The average scored for each of the two primary characteristics are 2.7, and 3.9 respectively. The value of Pearson corelation coefficient for the series of data obtained by the two primary variables is 0.96. This score differs from 0, for a significant difference of 0.1. The results of the study show an improvement of the PA institutions functionning, viewed from the point of view of their performance evaluation system and from the point of view of personnel evaluation system, as compared to the situation of 2004, when results of studies showed an unsatisfactory system of measuring employees performance in PA institutions. The Action Plan of the Strategy recommended and implemented general standards of assesment of public employees activities, and this led to an improvement in their work. The same objective that is the improvement of civil servants work assessment was the main point of the Order issued by the President of the National Agency for Civil Servants, 206/2005, which approved a general Methodology and Assessment Criteria for the work of civil servants.

2.3.5. Transparency at the level of Public Administration Institutions

In order to evaluate transparency at the level of decision making process in public administration institutions, the study took into consideration the extent at which employees in public administration institutions are familiar with the rules of the decision – making process; the extent at which civil servants have access at information on the functioning or strategic development of their institution, and the quality of communication channels between subordinated personnel and chiefs of departments. On the basis of the three primary characteristics, the variable X_5 is defined, assuming values from [0 … 4]. A score of 0 shows a completely unsatisfactory opinion of civil servants on transparency

in their institution, and a score of 4 shows full satisfaction of employees on this point.

The average level for this characteristic, of 3.09, shows a quite good opinion on this parameter, the standard deviation calculated for this variable is 1.169.

Considering that the existence and the implementation, on a regular basis, of a system of indices evaluating performance of the institution, and of its employees is a factor of increasing the transparency of decision – making process in P.A. institutions, then for the estimation of this aspect of PA institutions, the variable C_2 is defined. This assumes values [0 … 4]. 4 means a high level of transparency in the decision – making process of PA institutions.

In order to improve the process of communication and to increase transparency some institutions are issuing Bulletins of Information. For a more comprehensive evaluation of all aspects connected to transparency, a second variable C_2' is defined. This variable is defined depending on C_2 variable, and on a new variable, defined on a measuring scale assuming three values: 1, if the given institutions is issuing a Bulletin of information, on a regular basis; 2, if such a thing does not exist; and 3, if the civil servant interviewed knows nothing on such a Bulletin. For this variable, the following distribution of answers was obtained.

Table 2

Perception on issuing an Information Bulletin

Answer	-1	0	1	no answer
Share held by answers (%)	31.3	10.0	50.5	23

In a similar way, by comparison with the analysis of quality of PA institutions, are calculated averages and standard deviations for the 4 parameters used in defining perception on transparency in PA institutions. Indices are calculated function of the types of institution, of the sex of the persons under survey (male/female), and of types of personnel: either management staff or subordinated personnel. The values taken for the 2 parameters considered, the value of F statistics and the significant difference are as follows.

Table 3

Characteristics of variables defining quality of activities performed by PA institutions

		X_4	X_5	C_2	C_2'
Type of institution	APC	2.86(1.07)	2.99(0.89)	2.93(0.89)	1.90(2.52)
	CJ	2.90(0.71)	2.86(0.80)	2.88(0.63)	2.71(2.78)
	P	2.98(0.95)	3.14(0.84)	3.06(0.79)	2.32(3.79)
	SPD	2.91(0.96)	2.98(0.88)	2.95(0.78)	1.91(2.53)
Statistics *F* and value of *p*		-	-	-	2.502 (0.04)
Male/Female					
	M	3.05(0.87)	3.13(0.78)	3.09(0.73)	2.30(2.73)
	F	2.83(0.97)	2.90(0.91)	2.87(0.81)	1.89(2.65)
Statistics *F* and value of *p*		6.653 (0.00)	7.224 (0.00)	8.957 (0.00)	2.603 (0.08)
Type of personnel	PE	2.79(0.99)	2.86(0.91)	2.83(0.81)	1.94(2.81)
	PC	3.14(0.81)	3.21(0.75)	3.18(0.68)	2.22(2.45)
Statistics *F* and value of *p*		29.119 (0.00)	33.335 (0.00)	41.788 (0.00)	-

The results scored so far show the following conclusions:

1. the opinion of the civil servants interviewed, on the quality of the system of performance evaluation of employees, and on transparency of decision making process in their institutions is quite similar, in all categories of institutions of the survey;
2. female population interviewed has a more critical opinion on these aspects, as compared to male population interviewed;
3. there are also significant differences of opinion between the management staff and the subordinated personnel ; the latter have a much more critical opinion on the four aspects taken into consideration by the study.

4. in most cases (over 50%), Central Public Administration (APC) and Decentralized Public Services (SPD), do not issue Bulletins of Information.

2.3.6. The pressure put by the Political System on Public Administration Institutions

On the basis of information supplied by statistical questionnaires, two statistical variables are defined, for estimating the pressure put by the political system on the public administration institutions. Two possible situations of interference of the political system on public administration are taken into consideration: (i) the negative aspect of the interference, that is pressures put by political persons on the trade – unions of PA institutions, on recruitment and promotion of personnel in management positions (X_6); (ii) the positive aspect of the interference, measured by a favorable opinion expressed by civil servants when political changes after local or national elections bring about changes in public administration (X_7).

The variable (X_6) is defined function of three elements measuring the pressure of the political system on central and local public administration: (i) interference at the level of trade unions in PA, with a view to minimize public protests of employees (strikes); (ii) interference of political persons in recruitment and/or promotion of personnel in management positions; (iii) either directly or by third persons or organizations. The values of this variable are measured on a scale from [0 … 4], corresponding to: 0 is the situation when political persons do not interfere in administration; 4 is the situation when political system pressure on administration is at a maximum point. A small figure for the average of this characteristic shows little influence of political factors on commissions of recruitment/promotion of civil servants. At the level of the population under survey the average scored by this characteristic was 1.790 and a standard deviation of 1.45.

These value show a significant pressure put by political factors on commissions of examination for civil servants employment and promotion.

Results obtained after the survey are consistent with similar inquiries carried out at the level of public administration, by various national or international organizations. As a matter of fact, the diagnosis analyses on which the results of the Strategy for Reforming P.A. are based, as well as Country Reports issued by the Commission of the European Union pointed out major disfunctionalities of the system of management for civil service, which does not encourage the development of civil service, based on modern methods of recruitment, promotion and assessment of civil servants. More often than not, the principle of political non-commitment and transparency rules were neglected. Among the main shortcomings of the system of recruitment and promotion of civil servants, we can mention: the lack of a national competition, organized each year, for employment on vacant jobs in PA institutions; a deficient organization of competition and examinations for jobs in administration; insufficient personnel specialized in recruitment, promotion and evaluation of civil servants, etc.

As a matter of fact, the changes at Government level brought about changes in all technical management bodies of all Ministries[1]. This is the general rule for all the Governments that governed in Romania for the last 18 years of transition. We only give two examples that happened after the last government restructuring; we specify this is not an isolated case, but many examples of the same kind can be given, for the successive Governments that ruled Romania in these years.

The first example is the Ministry of Transports. The last restructuring of the Ministry, replacing the Democrat Party

[1] Information supplied by newspaper „Cotidianul", May 28, 2007, in the editorial „*Orban, the champion of purges: 11 Managers were dismissed, in 40 days*", p. 1.

member Radu Berceanu, by Ludovic Orban, a member of the National Liberal Party conducted to the replacement of no less than 11 managers, directly subordinated to him. These managers were representing companies in which the volume of investments is substantial, that is: Romanian Company for Highways, Romanian Railways Company (CFR SA), Romanian Road Transporters Authority, the Society for Railways Tourism, the Administration of Harbours - Constanta, the Administration of Sailing Channels, the Romanian Fleet Authority, the Civil Aircraft Authority, Tarom, the Romanian Railways Authority, etc. According to the newspaper mentioned above, the managers who lost their positions had been recommended by the former government party, Democrat Party, and these who occupied their positions are either members, or supporters of the present government party, the National Liberal Party. During the lapse of his governance, Minister Ludovic Orban modified more than half of the structure of Boards of Administration and General Assembly of Shareholders for the main societies or companies subordinated to him. For the General Departments in Ministries, things were a little bit more difficult, since the personnel employed in these Departments are considered civil servants. Under these conditions, in order not to be in contradiction with the legal provisions of Law 161/2003, a trick was used, that is these administration structures were first demolished, and then re-created, under another name.

The second example comes from the field of the Ministry of Economy and Finance. Thus, "a document edited by the branch of the National Liberal Party located in Sibiu, shows the following situation: in Romania, year 2007, public office can only be obtained on a political basis; the Minister of Economy and Finance, Varujan Vosganian, is blamed for this situation in the editorial, for the reason that he appointed the position of General Manager for Transgaz SA Medias, without taking into account the

previous negociations for that position, which was supposed to be offered to the chief of the Liberals in Sibiu"[2].

Similar editorials can be seen in many newspapers, all along the period of time that elapsed since 1990, criticizing the government in place at that time. A good thing, still, is that the position of Prefect was professionalized, the person holding this position is now a high civil servant.

The variable measuring transformations in PA, as a result of political changes, is defined function of variables measuring positive changes occuring after local or general elections at the level of State – budgeted managers, of public services management and of personnel policies.

On the basis of data collected from interviewed public employees, an average level of this characteristic of 2.140 was calculated, for a standard deviation of 1.034. Between the two variables X_6 and X_7 there exists a significant linear dependency. The value of Pearson coefficient of correlation equals to 0.327, differing from 0 for a significant difference of 2%.

Starting from the result presented in Table 4, we can make the following remarks: (i) the influence of the political system is much more obvious at the level of Central Public Administration (CPA), than in County Councils (CC), Prefectures (P) and Decentralized Public Services (DPS). The value of variable X_6 for CPA is 1.61, this figure being much higher than in the three former cases; the significant difference of the test is $p < 0.03$; (ii) the perception of the personnel in Public Administration on the pressure put by the political system on PA does not differ too much, at the level of groups interviewed, function of the sex of the person (male/fermale), nor function of their position in the institution (either management staff or simple employees); (iii) the personnel in County Councils (CC) has expressed the general opinion that political changes occurring after elections brought about important changes at the level of management institutions in

[2] „The Gardian" - May 28, 2007, „*Liberals are disputing their prey*".

State budgeted institutions, in the field of services in personnel employment.

Table 4

Characteristics of variables defining pressure put by political system on PA , $(X_6$ **şi** $X_7)$ **and the process of de-centralization** $(X_8$ **şi** $X_8')$.

		X_6	X_7	X_8	X_8'
Type of institution	CPA	1.61(0.82)	2.09(1.01)	2.43(0.67)	2.36(0.59)
	CC	1.25(0.70)	2.24(0.93)	2.78(0.48)	2.73(0.44)
	P	1.30(0.77)	1.88(0.82)	2.69(0.54)	2.58(0.52)
	DPS	1.35(0.76)	1.93(0.89)	2.61(0.58)	2.56(0.53)
Statistics *F* and value of *p*		4.129 (0.003)	2.789 (0.03)	-	7.257 (0.000)
Male/Female					
	M	1.37(0.78)	2.04(0.95)	2.65(0.54)	2.64(0.54)
	F	1.38(0.75)	1.95(0.93)	2.58(0.61)	2.50(0.53)
Statistics *F* and value of *p*		-	-	-	7.352 (0.001)
Type of personnel	PE	1.38(0.78)	1.96(0.91)	2.59(0.61)	2.50(0.53)
	PC	1.37(0.73)	2.00(0.90)	2.63(0.55)	2.65(0.53)
Statistics *F* and value of *p*		-	-	-	14.279 (0.000)

2.3.7. The de-centralization process

In order to evaluate consequences of the de-centralization process, a variable defined function of ten characteristics, measuring the capability of public administration to manage public funds at local level, to ensure health public services, social assistance services, public services of education, public services of culture, public services of defense of public order, public services of civil protection, forecasting and economic and social development, organizational capability, is given, namely X_8; this is defined on a measuring scale assuming values from [1 … 4].

The bigger the value, the more administration has a better capacity to fulfil its basic functions. For values scored at the level of population interviewed, an average value of 2.610 and a standard deviation of 0.590 were calculatated. These figures show a poor capacity of public administration to fulfil its basic functions.

Taking into consideration the importance of the system of financing public administration – either central or local – and its capacity to provide services of good quality, another variable is defined, namely X_8, in order to assess the quality of the de-centralization process. This is calculated function of variable X_8 and of the variable measuring the capability of the present financing system to meet the requirements of public institutions in central and local public administration. A small value for this variable shows a low capacity of the present financing system of local and central public administration in fulfilling its basic functions.

The average value scored at the level of the group interviewed of 2.53 (for a square average deviation of 0.620) shows major disfunctionalities of PA in fulfilling its major tasks, as well as a poor adjusting of its financial resources to the needs of its institutions. As a matter of fact, The Strategy for PA reform shows that no adequate financial resources were transferred for the de-centralization process, and there is not a clear delimitation of transferred competencies, nor the levels of decentralization. In this area of concerns, the Strategy recommends the reforming measures to reinforce local autonomy of local public authorities: increase of the share of incomes of local administration to over 50%; improvement of the system of financing local investments, improvement of local budget management and auditing, etc.

In support of its de-centralization process, Romania received European funds, as well as funds offered by IBRD, as follows:

(i) By programme Phare 1992, a project amounting to 1,5 million € was carried out, with a view to improve training capacities for personnel in local public administration, to develop

local authorities and management abilities at local level, issuing information bulletins and developing documentation centres.

(ii) By Phare programme 1997, projects amounting to 5 million € were supplied, with a view to help local administration to implement principles of subsidiarity and local autonomy.

(iii) By Phare programme 2002, the project "De-centralization and development of local public administration in Romania", amounting to 4,73 million €, was carried out, with a view to implement a taxation reform, transferring some activities co-ordination from central, to local levels, and creating autonomous resources of financing at local level.

(iv) By Programme Phare 2004, the following projects are going to be carried out: "The process of de-centralization and de-concentration, under the co-ordination of central administration", with a budget of 1,4 million € and the project "Reinforcing financial autonomy of local authorities, by continuing taxation system de-centralization, with a budget amounting to 1,2 million €.

(v) By programme Phare 2005 and 2006 two projects are now carried on: "Management of the Fund for Developing and Modernizing Local Administration" and "Fund for Developing and Modernizing Local Administration - model of non – reimbursable financing for Local Administration".

(vi) By programme PAL – financed by the World Bank – IBRD, a series of projects with a view to consolidate the institutional framework for de-centralization process were also carried out.

2.3.8. The civil service

In order to analyze some specific aspects of the civil service and to assess the impact of the civil service reforming on the corruption embedded in the system, we define variables that take into account the following aspects: evaluation of the satisfaction degree of people employed in P.A.; the quality of relations in the work-process, as well as a series of aspects strictly connected to the

reforming process of civil service. The next pages will treat characteristic components of the above mentioned parameters.

A. For **measuring the degree of satisfaction of civil servants**, a variable is defined, which measures the satisfaction of the employees on their monthly incomes, the esteem that their colleagues, chiefs and the public show for the quality of their work, and the conditions in which they perform their activities. More specifically, in order to define this variable, the following 8 aspects describing the level of satisfaction of civil servants at their work are given: the average monthly income of the employee, the esteem showed to him/her by colleagues, by the direct chief, by the management of his/her institution and the conditions at work, that is: the quality of the work place, of his computer and of his connection to the Internet. This variable is defined on a measuring scale from 1, (the person is totally dissatisfied with the working conditions) to 5 (the person is perfectly content with his situation at work. After processing series of data, the averages and the standard average deviations for the parameters measured above are obtained.

Table 5

Average and square standard deviations for variables measuring the degree of satisfaction of PA employees at their work

Variable	X_9	X_{10}	X_{11}	C_3
Average scored	2,30	3,59	3,43	3,108
Standard deviation	1,003	0,756	1,016	0,678

Results obtained bring into relief a moderate degree of satisfaction of PA employees, function of the three parameters mentioned above. The most negative parameter is the present – day remuneration system of the civil servants in administration. Also, a negative perception, but with a moderate level, is the factor measuring working conditions. A positive aspect, still, is the degree of satisfaction civil servants express, for the respect shown to them by colleagues, chiefs and management and by citizens as such.

B. The quality of relations set up in the work process represents a major point in civil service assessment. The present study evaluates this parameter, considering the following aspects: the quality of working relations with colleagues within the same compartment, with colleagues of other compartments, with the manager of the institution, and with persons working in similar institutions. The evaluation of the satisfaction degree of civil servants, taking into account the quality of relations in their work process, was made on a scale from 1, to 4. 1 is the situation when the person is totally dissatisfied with the quality of relations at his office, 4, the maximum value, signifies he/she is perfectly content with the quality of relations in his daily activities. In order to measure the quality of work relations, considering all the six types of parameters, the variable C_4 is calculated.

At the level of the sample under study, an average level for this parameter of 3,31 was calculated, and a standard deviation of 0,51. The two figures show a good quality of relations, in the work process of civil servants interviewed.

C. Reforming civil service is one of the major priorities of public administration reform in Romania, this being achieved by improving management of civil service and continuous training of civil servants. The major disfunctions at the level of civil service fall into the following five categories:

(i) the same rules and regulations for all personnel employed in public administrations;

(ii) a stable and efficient system of remuneration, on long term, of the civil servants;

(iii) the management of civil service does not ensure a fair process of recruitment/promotion/evaluation of personnel employed;

(iv) the training and development courses for civil servants:

(v) mobility of civil servants.

The questionnaire used in the survey included questions measuring the opinion of groups interviewed on important issues connected to the reform of civil service. On the basis of responses

to questions were defined variables defining some aspects on the reform, viewed from this point of view.

To measure the quality of organizing competitions for employment/promotion in public administrations, variable C_9 is defined, on a measuring scale from 1 to 4. This variable evaluates specific aspects the groups interviewed expressed, on the way competitions for employment in public administration are organized, on the way promotions are obtained, and also describes particular aspects occurring in the practice of promotion on civil service positions, as well as the degree of interference of persons within the organization, at the moment when new people are employed, or promoted; it also describes the extent of political persons influence, the practice of offering presents or money to decision making factors, in order to obtain a job, or a biased organization of competitions. For this variable, a measuring scale of values from 1… 4 is used; 1 means there is no outside influence in getting the job; 4 means the job or promotion are obtained by decided on other criteria than the value of the candidate.

At the level of populations of the groups interviewed, after the processing of data series for the five variables taken into consideration, were obtained averages and squares average deviations, as follows in Table 6.

Table 6

Measurements of interferences in organizing competitions for employment in civil service

	Pressures exerted by networks			
	Inside the organization	Political	Presents offered	Unfair organization of competition
For obtaining a job in civil service				
Average	2,11	1,90	1,40	2,47
Standard Deviation	0,991	1,040	0,765	1,197
For promoting in civil service				
Average	2,35	1,92	1,41	2,38
Standard Deviation	1,037	1,033	0,780	1,218

A new variable of level 3 is given, for describing at what extent reforming public administration encourages those factors contributing to modernizing, in a short lapse of time. Among aspects concerned, we mention: employment of young persons in civil service; a better mobility at the level of civil service; the improvement of continuous education process (training and development of civil servants); the extent at which reforming civil service leads to diminishing corruption levels; a better transparency; a better use of the potential of people working in public administration; this variable, C_{10} is defined on a measuring scale from a minimum of 1, (the reform of civil service encourages modernization) to 5, that is the reform does not lead to improvements and modernization of civil service as such.

Table 7

Defining variables that describe aspects connected to civil service

		X_9	C_3	C_4	C_9	C_{10}
Type of institution	CPA	2.51(1.07)	3.21(0.66)	3.29(0.51)	2.11(0.75)	2.74(0.95)
	CC	2.31(0.98)	3.20(0.59)	3.31(0.48)	1.93(0.67)	2.69(0.85)
	P	2.68(0.96)	3.41(0.61)	3.43(0.49)	1.05(0.60)	2.56(0.90)
	DPS	2.16(0.96)	3.00(0.67)	3.28(0.52)	1.99(0.70)	2.64(0.92)
Statistics *F* and value of *p*		6.588 (0.00)	8.264 (0.00)	-	-	-
Male/Female	M	2.39(1.00)	3.15(0.66)	3.32(0.49)	1.96(0.66)	2.64(0.94)
	F	2.22(1.01)	3.06(0.67)	3.30(0.51)	2.02(0.71)	2.67(0.90)
Statistics *F* and value of *p*		-	-	-	-	-
Type of personnel	PE	2.15(1.00)	3.01(0.69)	3.27(0.51)	2.05(0.70)	2.68(0.90)
	PC	2.54(0.97)	3.28(0.59)	3.37(0.49)	1.92(0.66)	2.60(0.93)
Statistics *F* and value of *p*		26.770 (0.00)	29.953 (0.00)	6.453 (0.01)	6.454 (0.01)	-
General figure for all PA		2.29(1.01)	3.10(0.68)	3.30(0.51)	2.00(0.69)	2.66(0.91)

After processing data series collected from people interviewed, results were obtained – averages and square average deviations – for primary an aggregated variables used in characterising major aspects of civil service in Romania. Indices are calculated for all public administration, and for each group of employees, defined according to specific criteria.

Table 8

Characteristics of primary variables and of aggregated variable used in describing specific aspects of reforming civil service

	$Q_{4.81}$	$Q_{4.82}$	$Q_{4.83}$	$Q_{4.84}$	$Q_{4.85}$	$Q_{4.86}$
Average	2,98	2,86	2,36	2,68	2,56	2,50
Standard Deviation	1,162	1,033	1,032	1,209	1,132	1,076

The high values of averages scored for the two variables calculated show an inefficient reforming process, viewed from the point of view of modernizing civil service.

2.4. Analysis of corruption facts in public administration

Economic literature grants a special attention to studies connected to measurements of corruption and its impact on economy (as a whole) or on a few sectors of activity (more specially). Thus, studies estimating the impact of corruption on economic growth (Schleifer and Vishny, 1993; Mauro, 1995), on military expenses (Gupta, Mellon and Sharan, 2001), on public systems for health and education (Gupta, Davoodi and Tiongson, 2000), on development of industry in less developed countries (Emerson, 2002), studies on direct foreign investments (Wei, 1997), studies on the quality life and level of poverty (Gupta and others, 1998), etc.

With a view to analyzing phenomenon of corruption, the questionnaire comprised a series of questions measuring the opinion of civil servants in P.A., referring to corruption levels, to factors causing corruption to appear, and to economic and social consequences of this phenomenon.

2.4.1. Levels of corruption in various sectors of activity

For evaluating the opinion of civil servants and employees on the magnitude of the corruption phenomenon, we consider variable C_5, measured on a scale from [1 … 5] ; 1 is the value a low level of corruption, 5 for the situation when corruption became general. In order to define this variable, the opinion of P.A. officers on levels of corruption in public health, public education, in political area, local public administration, central public administration and corruption in their own institution, is asked.

The average level of this parameter, estimated on the basis of data collected from civil servants interviewed is 3.20, for a standard deviation of 0.80. Transforming this value on the scale of Transparency index (TCI), we score a value of 3.6, showing relatively similar results on the two types of measurings. As a general rule, the values scored for this particular index for Romania range between 3.0 and 3.4, which places Romania among countries with very high scores of corruption, at European level. For transforming scale of measurements used by our study, to scale of corruption TCI, the following formula of calculation was used:

$$(5-3.2)\cdot\frac{10}{5}=3.6.$$

2.4.2. Consequences of corruption on economic and social environment

For evaluating opinion of employees in PA on negative effect of corruption in economic and social domains, the questionnaire included a series of questions on the basis of which were defined primary variables for measuring the negative impact of corruption on local development, on national development, on the quality of education, on the public health system, on the quality of the political environment, on the quality and image of local and central public administration. The variable measuring negative effects of corruption on economic and social domains is C_6. This variable is measured on a scale from –2, (very negative

consequences of corruption) to 2 (the persons interviewed consider that phenomena of corruption can have a series of positive effects on economic and social domains).

The average level of the aggregated variable, of -1.06 shows the perception of a negative effect of corruption phenomena on economic and social domains in Romania. The standard deviation for this variable is 0.91.

2.4.3. Contribution made by some factors, for reducing corruption phenomena

With a view to diminish corruption levels in a country, various strategies can be designed, by creating new institutional structures, improving the legal framework for fighting corruption, making state structures more efficient, by creating - at local and central level - efficient institutions, by modernizing civil service, re-shaping the political parties, creating, at the level of the civil society, non-governmental organizations supporting efforts against corruption, and so on.

An important role in diminishing corruption levels is played by mass-media, which, more often than not, contribute to a better transparency of decisions made at public levels. Cultural factors, as well as mentality of a given population in a county or a geographical area, have a direct contribution on maintaining a certain level of corruption. In order to measure the influence of some factors to diminishing corruption levels, the civil servants interviewed were asked to tell their opinion on the influence of the media, of the education system, of the Church, of the political class – at central and at local levels – representatives of the State/ civil servants in local and central public administration, and of simple citizens, in reducing levels of corruption. For measuring primary variables mentioned above, we used a scale of measurement with five integer numbers in the interval -2 (case in which the effect of the factor does not diminish corruption, but on the contrary, it encourages the phenomenon), to 2 (value attributed to the case when the respective factor has a major contribution to diminishing

corruption). On the basis of the above mentioned variables, an aggregate variable measuring efficiency of factors diminishing corruption, C_8, is given.

The average level of this characteristic is 0.22, and the standard deviation is 0.82. The medium value for this characteristic shows an insignificant influence of factors fighting corruption, in the Romanian society. For the eight factors taken into consideration, the average values and square standard deviations were calculated.

Table 9

Characteristics of factors contributing to diminishing levels of corruption

Variable	$Q_{5.61}$	$Q_{5.62}$	$Q_{5.63}$	$Q_{5.64}$	$Q_{5.65}$	$Q_{5.66}$	$Q_{5.67}$	$Q_{5.68}$
Average	0,89	0,68	0,74	-0,43	-0,29	-0,02	0,13	0,17
Standard deviation	1,072	0,890	0,940	1,356	1,280	1,241	1,191	1,185

The media has a positive significant value in reducing corruption levels, while the behaviour of the political class at central level does not encourage diminishing of corruption levels. On the contrary the behaviour of the political class encourages corruption phenomena. The behaviour of civil servants in central and local public administration in reducing corruption phenomena, is situated in a neuter area.

2.5. Conclusions

We conclude this chapter of the present study, presenting the following conclusions, on the basis of results scored until now. These results can be used in defining econometric models that can be used in analyzing public administration capability to fulfil its basic functions, to reduce corruption phenomena, to be transparent and to satisfy the needs of its employees:

(i) For most variables used in the study, there exist significant differences at the level of the four types of institutions

working in public administration. Taking into consideration conclusions obtained by using ANOVA analysis, these differences are obvious, at the level of aggregated variables of third degree, which were given to measure the quality of activities performed by public administration institutions; (variable C_1, for which the significant difference of test F is $p < 0.04$), transparency at the level of public institutions $(C_2', p < 0.04)$, satisfaction of employees in this area of activities $(C_3, p = 0.00)$, level of corruption phenomena $(C_5, p = 0.00)$ and perception of the persons interviewed on consequences of corruption in economy and social life $(C_6, p < 0.07)$. This remark recommends a requirement of defining models of regression, for all public administration domain, as well as for the four types of institutions functionning within public administration.

Table 10

Characteristics of variables defining aspects connected to civil service

		C_5	C_6	C_8
Type of institution	CPA	3.36(0.82)	–1.08(0.97)	0.22(0.82)
	CC	2.97(0.74)	–0.87(0.95)	0.30(0.75)
	P	2.98(0.75)	–0.99(0.88)	0.88(0.78)
	DPS	3.19(0.80)	–1.13(0.86)	0.21(0.81)
Statistics F and value of *p*		4.863 (0.001)	2.241 (0.07)	-
Sex of person	M	3.09(0.74)	–1.04(0.88)	0.25(0.84)
	F	3.24(0.83)	–1.09(0.92)	0.20(0.78)
Statistics F and value of *p*		3.496 (0.03)	-	-
Category of personnel	PE	3.22(0.83)	–1.10(0.90)	0.80(0.81)
	PC	3.11(0.74)	–1.02(0.92)	0.27(0.79)

Statistics F and value of *p*		3.544 (0.06)	-	-
Reform of public office	$GR_1 = (3.67 \quad 5.00]$	3.71(0.93)	−1.35(0.99)	0.20(0.73)
	$GR_2 = (2.33 \quad 3.67]$	3.44(0.82)	−1.07(0.95)	0.03(0.80)
	$GR_3 = [1.00 \quad 2.33]$	3.02(0.75)	−1.05(0.88)	0.31(0.79)
Statistics F and value of *p*		28.107 (0.00)	-	10.062 (0.00)
Transparency in PA	$GT_1 = [0.00 \quad 1.33]$	3.89(0.63)	−1.38(0.94)	−0.23(0.98)
	$GT_2 = (1.34 \quad 2.67]$	3.47(0.71)	−1.12(0.92)	0.05(0.73)
	$GT_3 = (2.68 \quad 4.00]$	3.00(0.80)	−1.03(0.89)	0.32(0.81)
Statistics F and value of *p*		41.875 (0.00)	2.470 (0.09)	13.731 (0.00)
For all PA		3.172(0.81)	−1.07(0.91)	0.22(0.81)

(ii) The same remark is valid for defining groups of employees in public administration function of the sex of the person, male, or female. Thus, the difference appears for the variable of 2-nd degree, used in measuring budgeting performance of the institution $(X_2, p < 0.01)$, the pressure exerted by the political system on the institution of public administration $(X_6, p < 0.03)$, transformations occurring in the system as a result of political changes after local and national elections $(X_7, p < 0.03)$ and the degree of satisfaction of civil servants in connection with their monthly remuneration $(X_9, p = 0.00)$.

(iii) Intensifying reform processes at the level of public office brings about diminishing of corruption levels. The highest level of corruption is shown by a group of employees who considered that the lack of a reform process in public administration is the cause of corruption. As a matter of fact, between groups of employees, $(GR_1, GR_2 \text{ şi } GR_3)$ defined according to their perception on corruption levels, there exist significant differences in the estimation of the degree of corruption in the system $(p = 0.00)$. Studies carried out in public

administration institutions show the fact that small monthly remunerations, discretionary standards in the work of administrative institutions, and the lack of other types of incentives in the work of civil servants, are important factors augmenting corruption levels in the system.

(iv) Another important factor in causing corruption phenomena in the system is the lack of transparency in institutions belonging to public administration. Thus, as it can be seen in data presented by Table 10, the more decision-making process is transparent, the lower the level of corruption. Size of corruption perception differs for each group of employees interviewed *(GT_1, GT_2, GT_3)*, each group is defined according to a level of transparency. In this particular case, the value of the significant level of the test is $p = 0.00$. The Strategy for Reforming Public Administration recommends, as a major objective for medium term, "The Improvement of the Image of Public Administration, by increasing Transparency of Administrative Activities and Taking Firm Measures against Corruption, obvious for the Public Opinion"[3].

(v) The level of satisfaction of civil servants can be improved by motivating rules of employment and stable incomes for a longer lapse of time. As a matter of fact, among the three parameters describing the degree of satisfaction of the public officer, the income, the respect showed by the public for their work, and the conditions at work, the first has the lowest score. The average for this variable is only 2.30, as compared to the averages scored by the other two variables, of 3.59, and 3.43 respectively.

(vi) The financing system of public administration institutions does not meet the requirements of P.A.

[3] Updated Strategy of Government for Accelerating Reform of Public Administration, 2004-2006, Bucharest, p. 6.

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Chapter 3

Models of Quantitative Analysis of Corruption in Public Administration

3.1. Introduction

Analysis of corruption is an important field of contemporary economic research. In the recent years, researchers and university professors, as well as international organizations, such as the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD), have been particularly concerned with the study of corruption levels, trying to identify its causes and the mechanisms of transmission of corruption through a system, the measuring of corruption consequences on economic and social facts in a country or in a region of development. Among the most important classical studies in this field of research, we mention A. Krueger [1974], S. Rose-Ackerman [1975], Mauro [1995], Tanzi [1998], and so on. The lapse of time following economic and political changes in Eastern Europe, after the fall of the socialist system, brought about new means of corruption formation, as well as ever more sophisticated ways of transmitting it through the new social systems, in full process of transformation.

The new situation also stimulated development of research studies in the field. The more so as the IBRD (2001), identified

corruption facts as being "*the only serious obstacle in the way of economic and social development*". During this lapse of time, a series of outstanding studies analysing the economy of corruption were published, more exactly the quantitative analysis of corruption. Among the most important books published in the nineties, we mention: P. Mauro [1995], P. Bardhan [1997], V. Tanzi [1998], Shang-Jin Wei (1997), and so on.

An important issue in analysing corruption is to identify causes making it appear in a public system. The speciality studies identify four categories of factors with direct influence on corruption in a system: political and legal factors, historical, social and cultural factors, and economic factors. Within the first category of factors, we include the quality of the political system, the particular features of the legal system (see Leite and Weidmann (1999)); especially the legislation and the institutions having the mission to fight corruption in a given country; the quality of the democratic system, the features of the election system in a given country, the type of administrative institutions, the degree of de-centralization of the system, and so on. A series of studies, such as those written by La Porta (1999), Treisman (2000) show that traditions and historical factors of a country have a strong impact on the level of corruption phenomena and on mechanisms enabling its transmission throughout the system. Social and cultural factors play a special part in revealing corruption characteristics in a given country (La Porta (1999), Treisman (2000), Alesina (2003). Equally, religious factors play an important role in propagating corruption within a social system. Economic factors, such as the level of openness of an economy (see Dreher (2003), Treisman (2000), Wei (2001)), the size of the public sector (Tanzi (1998), Treisman (2000)), the size of remunerations in public sector (van Rijckeghem (1997)), and so on, all have their influence on corruption in a country.

Another important aspect in studying corruption is the choice of the most adequate econometric models for estimating its consequences on some sectors of activities. Among the most

important fields of research, studying consequences of corruption on economic and social environments, we mention:

(i) models referring to general economic growth (Mauro [1995], Abed and Davoodi [2000], Krueger [1974]);

(ii) models on development of only a few sectors of national economies; (Tanzi [1998], Shang-Jin Wei [2001]);

(iii) models on consequences of de-centralization processes on the level of corruption and on mechanisms of transmitting it through the system (Shah [2006]);

(iv) models on the quality of financing systems for some sectors of activities, such as the military system (see Gupta [2001]; systems of remuneration in public sector (van Rijckeghem and Weder [1997]);

(v) models on industrial policies in a country (Emerson [2002], Bhagwati [1982]) and on investments projects efficiency (Sarkar [2001], Mauro [2002]).

Most of the above mentioned studies use, in order to estimate the impact of corruption on economic and social life, at national, sectorial or regional levels, models of regression, VAR type models, and the analysis of co-integrated series. Kaufman (1999) and Andrei (2008) propose the use of models with simultaneous equations, for estimating corruption consequences on public administration activities within a country. In this particular case, variables of the model are either endogenous or exogenous, and parameters are estimated by method of two stages least squares (TSLS) and by the General Method of Moments (GMM). This particular method takes into account the endogenous or exogenous type of each variable within the model. As far as this method is concerned, we should nevertheless specify that there is not yet a precise choice of the variables that must be chosen in the process of estimation of parameters for models with simultaneous equations, used in analysis of corruption in a public system (see Bai and Wei [2000]; Kaufmann, Kraay and Zoido-Lobaton [1999]). In Romania, a series of estimations of corruption consequences in public administration were made in studies written

by Andrei [2007], Profiroiu [2005], Teodorescu [2007a]; also, studies signed by Teodorescu [2006, 2007b] on consequences of corruption in universities; studies on consequences of corruption, on the quality of financing in some sectors of activities were also written by Andrei [2002] and Matei [2007].

3.2. Defining the model

In the present study, in order to define the model of analysis for the quality of the reforming processes in public administration, the model used is proposed by Becker [1968], similar to approaching a crime/punishment situation. Thus, the option of a person to commit a crime is in fact a ratio between the profit obtained by committing a crime and the losses or penalties that he must suffer, if he doesn't commit the crime, or if the crime is discovered.

In defining the model of analysis of the quality of reforming process, the aim is a quantitative analysis of results obtained after a series of reforms. This is why, the present study presents the reform in public administration according to criteria set up by the Strategy of Reforming Public Administration, 2004. We specify that the reforming of Public Administration in Romania was recommended by internal requirements, but also by the prerequisites of Romania's integration to the structures of the European Union. This is why the draft for this document was made with the direct support of the Commission of the European Union, which granted Romania financial and technical support through Phare 2001 programme, "*Support for a project of reforming strategy for public administration*".

According to the 2004 Strategy, the reform is a process of transforming local and central public administration institutions, in order to meet the requirements of their beneficiaries and the requirements of the process of integration of the country in the structures of the European Union. From this point of view, three components of the reform process were identified:

(i) the reform of the civil service, by improving the management of civil service and improving the courses of training for civil servants;

(ii) the reform of local public administration, by continuing the de-centralization process;

(iii) improvement of the process of defining a precise framework for public policies.

Under these conditions, we define the model of analysis of the reform process in public administration, starting from the following three work-hypotheses:

[Hypothesis 1]. For reforming public administration, there exist a strategy and an action plan.

Within this plan, a series of actions grouped in the following three objectives are included:

O_1 - actions in the area of civil service, with a view to develop management of change, on the short term, and to stabilize and consolidate the system of civil service, on the long term;

O_2 - second objective, in the field of reforming local public administration, with a view to bring public administration closer to the citizen, and to create mechanisms through which central government can communicate better with local public administrations;

O_3 - actions with a view to improve the process of defining specific national public policies and local public policies, that should support the managerial capability of the Government, of the County Councils and of Local Councils to fulfil objectives and to meet the requirements of national and local development.

[Hypothesis 2] For meeting the specific objectives, the Action Plan accompanying the „Strategy for Reforming PA" provides precise activities. In order to measure positive consequences of reforming PA, the following three functions are defined:

$$R_i = R_i(A_{i1},...A_{ip_i}), \quad i = 1,2,3$$

where A_{ij}, with $j = 1,..., p_i$, represents the whole set of actions meant to be carried out for fulfilling specific object O_i. p_i represents the number of actions to be taken for fulfiling each specific objective.

With a view to reforming Civil Service, 17 actions must be performed, with the following objectives:

(i) creation and implementation of a unique system of recruitment, promotion and evaluation, based on personal merit;

(ii) creation and implementing of a unique system of remuneration of civil servants;

(iii) creation of the profession of public manager and developing the required competencies for supporting the reforming process and the process of integration to EU structures;

(iv) reinforcing the capabilities of the National Institute of Administration to implement strategic components of continuous training-development of civil servants.

In the field of local public administration the Strategy comprises 25 actions with a view to:

(i) define mechanisms and necessary structures to co-ordinate the above mentioned actions;

(ii) to reform public sectors of Education, Health and Social Assistance;

(iii) to improve local budgets funding;

(iv) to increase incomes of public organizations and to make clear issues concerning public institutions ownership;

(v) to improve the system of transferring money;

(vi) to design a new legal framework for activities of Prefectures and for training and developing civil servants working in the Prefectures;

(vii) to develop the capacity of local authorities to implement reform, by training/development of human resources, by new standards and by managing the newly created decentralized organizations.

For the improvement of the process of defining public policies, the Strategy recommended 11 actions, with the following objectives:

(i) reinforcing governance capability at central and local levels, with a view to support the process of defining public policies;

(ii) to increase the part played by high civil servants in defining and assigning public policies;

(iii) To improve the process of defining public policies, as such;

(iv) To improve co-ordination actions in between institutions at central and local levels, in the process of defining public policies.

[Hypothesis 3]. On long term, and on medium term, the reforming actions recommended by the Strategy, will assure an improvement of public administration institutions, by providing better quality services to their customers, diminishing the costs of public institutions functioning, increasing the contribution made by public administration to local and national development, lowering corruption levels, and so on.

Under these conditions, we shall see that each function that measures positive consequences of the reforms made in the three domains mentioned above is an increasing function, as compared to the volume of activities allocated to each action recommended by the Strategy:

$$\frac{\partial R_i}{\partial A_{ij}} > 0 \;\; i = 1,2,3 \text{ and } \; j = 1,2,...,p_i.$$

[Hypothesis 4]. For the support of the reform process, adequate financial resources were provided.

These financing sources were supplied from the State budget and from foreign investments, mainly European projects in the Phare Multiannual Programme 2004-2006 or PAL Programme,

financed by IBRD Financial resources, distributed for the three main priorities, are as follows:

- For Civil Service, 7 200 thousand €. To this amount, we should add 13 937.6 thousand € per year, for the training - in the next three years, of the following categories of personnel: 100 high civil servants, by courses of specialization of one year each; 150 young professionals, by specialization courses of one year, or two years; 3000 civil servants (top management) by courses of specialization of one year, and 9000 middle management personnel, working in public administrations, in three months specialization programmes.
- In support of reforming local public administration, projects financed by Phare Programme, and by PAL Programme of the IBRD, amounting to 8 150 thousand €, were supplied.
- For the third component of the reforming process projects amounting to 8 150 thousand € were planned. As a matter of fact, the financial support granted by the European Union for public administration reforming, from 1992 until the start of Multiannual Programme Phare 2004-2006, amounts to 42 000 thousand €. The value of Phare projects in the multiannual programme of support of the Strategy amounts to 35 880 thousand €.

In our model of analysis of the reforming process, the costs are calculated for each activity necessary in supporting the reform process, also by taking into account the positive response of the public administration system to changes recommended by the Strategy, as well as by the evaluation of losses suffered by the system if no reform of administration is done, because of the lack of political factors will to do it. Under these conditions, we calculate the costs of the reforming processes, for each priority component of the reform, by the following formula:

$$C_i = C_i(A_{i1},...,A_{ip_i},\mathbf{B},\mathbf{P}) \quad i=1,2,3$$

The vector variable $\mathbf{B}=(B_1,...,B_q)$ measures the positive response of the system to reforming measures, and vector variable $\mathbf{P}=(P_1,...,P_m)$ defines the capacity of the political system to

support reforming processes in public administration. Vector variable **B** measures the influence exerted on public administration by a variety of different factors, such as: mobility of employees in public administration, capacity of public administration institutions to organize fair and transparent competitions for getting jobs and promotions in public administration, the endowment of PA institutions with computers, and so on. The vector variable **P** measures direct or later consequences for public administration institutions of the actions of political factors, such as: indecision in promoting active measures of reforming PA, pressure exerted by political system through various decision-making channels, in order to obtain privileges for persons or organizations, corruption activities penetrating PA institutions, caused by local or central political authorities.

In the case of a normal response of PA system, we shall see that functions $C_i = C_i(\cdot)$ $i = 1,2,3$, satisfy the following properties:

(P1). The more significant reforming processes, the higher the costs of the reforms funded by national or international programmes according to the formula:

$$C'_{ij}(A) = \frac{\partial C_i}{\partial A_j} > 0.$$

(P2). The reforming measures recommended by the Strategy document ensure positive changes at the level of the system, with a given probability level. Thus, there are incurring risks that can slow down the pace of reforming public administration, as well as there are positive responses, unforeseen at the moment when the Strategy was designed, which could lead to diminishing the costs of the reform and obtaining positive results in a shorter lapse of time than that initially planned. Under these circumstances, we shall see that the function measuring the costs is a decreasing, concave function:

$$C'_{ij}(B)=\frac{\partial C_i}{\partial B_j}<0 \quad C''_{ij}(B)=\frac{\partial^2 C_i}{\partial B^2{}_j}>0.$$

(P3). For vector variable **P**, that measures the political will of political class to support the reform, we can have one of the following two situations:

$$C'_{ij}(P)=\frac{\partial C_i}{\partial P_j}>0$$

if there is no political will to reform public administration institutions, and in this situation costs of PA functioning are much higher than foreseen, and a second situation,

$$C'_{ij}(P)=\frac{\partial C_i}{\partial P_j}<0,$$

if the political factors have the will to make the necessary changes and to communicate effectively and efficiently with the technical levels of local and central PA, to implement the reforming measures.

[Hypothesis 5]. The net profit obtained after the reform is evaluated on the basis of the function:

$$CN=\sum_i (R_i(A_{i1},...,A_{ip_i})-C_i(A_{i1},...,A_{ip},\mathbf{B},\mathbf{P}))$$

Viewed from a material point of view, the net profit resulting if measures of reforming are implemented, is the following:

(E1). Increase of PA capacity to fulfil its basic functions.

(E2). Lowering levels of corruption in PA and at national level.

(E3). Increase of transparency in CPA and LPA institutions.

(E4). Increase of the satisfaction degree for employees who work in PA institutions.

Each of the four endogenous variables are depending on a series of factors. Within this study, taking into consideration the series of data collected from the PA employees interviewed, the

parameters of the regression models used to analyse the four endogenous variables will be estimated. The major objectives of the study are to identify factors influencing on the four characteristics and the possible differences existing in reforming processes at various levels of PA institutions

3.3. Statistical data used by the study

In order to define pertinent features of the PA reform, a research based on statistical sampling was organized in May 2007. The researchers defined a representative sample for PA employees. In order to make up a representative sampling, the researchers interviewed 971 civil servants, in two stages, in local and central public institutions. The error of estimating parameters for the target groups is of 1.2%, with a probability of getting correct results of 97%.

The people selected for the sample were interviewed, by a statistical questionnaire comprising questions referring to the following issues: the internal organization of public administration institutions, the pressure exerted by the political system on their institutions, the way de-centralization process in administration goes on, their opinion on reforming civil service as such, discrimination male/female in their institution, corruption and its consequences on economic and social development at local level and at national level. The questionnaire also comprised questions connected to personal aspects, such as the sex of the person, male/female, the age, the type of education, the institution where he/she is working, and other questions of this nature.

According to the structure of the questions comprised in the questionnaire, three categories of variables were defined, depending on their degree of aggregation.

1. Variables of level 1, with the lowest degree of aggregation. Each variable in this category describes a certain aspect of the reforming process.

The values of these variables are calculated on the basis of data collected from the sample, marked by $Q_{...}$. For instance $Q_{5.22}$ measures to what extent corruption in the system is induced by small remunerations of the personnel employed. Beside this variable, on the same level of aggregation, some other variables are calculated, such as the deficiency of legislation encouraging perpetration of corrupted facts, the quality of the economic and political environment, as well as the behaviour of the citizens, who may encourage or dissuade facts of corruption. Making exception of those variables expressing personal features, the variables at this level of aggregation and defined on the basis of four or five values. For instance, the above specified value assumes figures in the range $\{1,2,3,4,5\}$. These variables do not appear explicitly in econometric models, but they can be seen through aggregated variables of level two and three. For defining and expressing questions of the questionnaire and therefore of variables of level one, the following sources were used:

(i) Available similar studies written by Kaufman [2002], Profiroiu [2005], and other studies in the same field;

(ii) The diagnosis analysis and reforming measures recommended by the Strategy of reforming PA, 2004-2006;

(iii) The contents of Phare Multiannual Programme 2004-2006, which supported the implementation of the reform processes in PA;

(iv) PAL programme of the IBRD.

2. Variables of second degree are calculated by aggregating variables of first degree and describe only a certain component, not very general, of the reform process as compared to variables with first degree of aggregation. These variables are symbolized in our model by letter *X*.

3. Variables of third degree measure a certain general aspect connected to the functioning of public administration and to the consequences of the reform process on PA. These variables have

the highest degree of aggregation and depend on variables of first and second degree. In our models, they are symbolized by letter *C*.

Variables of second and third degree are defined so as allow the estimation of the parameters of regression models used in the study of PA capability to fulfil its basic functions, recommended by its legislation, to analyse aspects connected to evaluating corruption consequences in this field of activity, to measure the results of the reform process on transparency in institutions belonging to central PA or local PA, and to analyse influencing factors on satisfaction of employees at their work.

The most important variables of the research study are given in Appendix 1. For each variable a short definition of the variables of first and second degree is given, as well as the codes for each variable.

3.4. Models of regression

3.4.1. Models of analysis of performance for institutions in CPA and LPA

On the basis of variables in Appendix 1 two models of regression for analysing performance of PA institutions are defined. In both models, the variable measuring the quality of activities carried out in PA institutions is considered to be an endogenous variable. In both situations, parameters taken into consideration are referring to Public Administration (PA), to Prefectures (P), to County Councils (CC) and to de-centralized services (DS).

The first model of regression defines performances of public institutions function of the corruption levels and of the quality of organization of competition for getting jobs and promotion in civil service:

$$C_1 = a_1 + a_5 C_5 + a_9 C_9 + u_1 \qquad [M_1]$$

For the estimation of parameters OLS (ordinary, least squares) method was used, and the survey only took into consideration the questionnaires that answered all the questions referring to the definition of variables belonging to model of regression [1]. We should mention that, out of the total of 971 persons in the interview, only 813 specified the organization where they were employed. On the basis of these data, were estimated the parameters of the above mentioned model, at the level of PA. If answers of these people who hadn't specified their employer had been taken into consideration, then the data series would have comprised 873 answers, and estimations wouldn't have been very different. Result of these estimations are given in Table 1, column 2, and their values are marked by letter T.

The second model of regression takes into consideration, beside the variable measuring corruption level, other variables which describe the transparency of decisions in PA institutions, the pressure exerted by the political system on PA, the degree of satisfaction of personnel employed in public administration, and the influence of internal and external factors diminishing corruption levels, on PA institutions:

$$C_1 = a_1 + a_2C_2 + a_3C_3 + a_4C_4 + a_5C_5 + a_6X_6 + a_7C_7 + u_2 \quad [M_2]$$

In the two models u_1 and u_2 are residual variables of average 0 and constant variance. They are measuring the influence of other factors, which, because of objective reasons, are not included in the model estimating performance in central and local public administration institutions.

Estimation of parameters of this model was made in the same circumstances as for the first model. Because of this reason, the initial number of the values of data series used in estimating the model at the level of public administration was reduced from 953 people interviewed, to 878. Results of estimations are given in Table 2.

3.4.2. Models of analysis of corruption phenomenal

A model of regression for the analysis of corruption levels, is defined, comprising the following three categories of factors, classified function of their influence on the corruption levels:

(i) Factors that make corruption levels increase. In this category we include: fraud on competition for getting jobs or promotions in civil service FP (C_9) and the pressure exerted by the political system on public administration institutions (X_6).

(ii) Factors that make corruption levels decrease, such as: good quality of the work performed in PA institutions (C_1), transparency in the activities of PA (C_2), the level of satisfaction of employees in PA for the work they perform (C_3), the quality of relationships in the process of work, between people and institutions PA (C_4), the present capacity of PA to fulfil its main functions (X_8), the capability of the present financing system to sustain public services ($Q_{3.21}$) and the quality of the reforming processes of public office, (C_{10}).

(iii) A description of persons working in public administration institutions.

Among all these factors, we include in the models three variables, describing the sex male/female of the employee (C_{11}), the position of the person, management or subordinated personnel (C_{12}) and the type of education of the person (studies, degree obtained, a.s.o) (C_{13}). The regression model is defined by the following formula:

$$C_5 = b_0 + b_1C_1 + b_2C_2 + b_3C_3 + b_4C_4 + b_5Q_{3.21} + b_6X_6 + b_7X_8 + b_8C_9 + b_9C_{10} + b_{10}C_{11} + b_{11}C_{13} + b_{12}C_{14} + u_2 \quad [M_3]$$

where u_2 is the residual variable measuring the influence of other factors, not included in our model, on the levels of corruption.

In estimating parameters, only the questions with valid answers for the variables pertinent to the model were taken into consideration. For an estimation of parameters, we used OLS method (ordinary least squares); results of the survey are given in Table 3.

3.4.3. Models of analysis of transparency in PA institutions

For defining the regressive model used in analyzing transparency we can choose as an endogenous variable, either variable C_2 or C_2'. Explanatory variables used for defining the model, are grouped in the following four categories:

(i) Corruption, as a factor which reduces transparency in decision-making processes in public institutions;

(ii) Variables directly connected to the behaviour of employees in PA institutions, that is: the degree of satisfaction of civil servants at their work, the quality of work relations within their institutions, the fairness in organizing competition for getting jobs or promotions in PA;

(iii) Variables measuring certain components of reforming processes in PA. These last variables measure the action of factors that have a positive impact on increasing transparency in public institutions decision making, if the process is felt as changing the whole system, or a negative impact, if public employees in the survey have a negative perception on processes of reform in PA;

(iv) Personal characteristics, such as the sex of the person male/female, the age, the position of the person in the given organization, the education of the person, etc., all this being elements that bring differences in the manner civil servants perceive transparency in their institutions. Under these conditions, we define the regressive model for analyzing transparency as follows:

$$C_2 = c_0 + c_1 C_1 + c_2 C_5 + c_3 C_3 + c_4 C_4 + c_5 X_8 + c_6 C_{10} + c_7 C_{12} + u_3 \quad [M_4]$$

Estimation of parameters was made by the method of ordinary least squares (OLS), and results are given in Table 4. For each type of institution, we took into consideration only those questionnaires that had valid answers to all variables included in the regressive model.

3.4.4. Model of analysis of satisfaction of civil servants at their work

The level of satisfaction of civil servants at their work depends on the conditions at their work place, the size of their monthly remuneration as compared to their responsibility, the consideration shown to him/her by the people whom he serves, and by the results of the reforming processes in public administration institutions. Equally, perception of the satisfaction can be differentiated function of the sex of the person, male/female, by the position of the person, either management or subordinated personnel, and function of the level of education. Under these conditions, the regression model used for analyzing satisfaction of employees at their work is defined by the following:

$$C_3 = d_0 + d_1C_2 + d_2C_4 + d_3C_9 + d_4C_{10} + d_5C_{11} + d_6C_{12} + d_7C_{13} + u_4 \quad [M_5]$$

Estimation of parameters, for the four types of institutions (Public Administration, Prefect, County Councils, Decentralized Services) is made by applying the three methods used for the other three models of regression described above, and results are given in Table 5.

3.5. Model with simultaneous equations for analysing facts occurring in P.A.

Taking into consideration the manner of defining each variable, the series of data collected, the descriptive analyses made here above, the models of regression used until now and the similar approaches in studies written by Kaufmann [2002], Bai and Wei

[2000], Kaufmann, Kraay and Zoido-Lobaton [1999], we designed a model with simultaneous equations for analysing four important components of PA institutions: performance, levels of corruption, transparency, and level of satisfaction of employees at their work. For the definition of the four equations of this model, we shall take into consideration the following parameters:

Performance of institution = $f_1(.)$
Corruption level = $f_2(.)$
Transparency level = $f_3(.)$
Level of satisfaction of employees at their work = $f_4(.)$

The model with simultaneous equations defined for the analysis of significant aspects in P.A. institutions is written, in an explicit form, as follows:

$$C_1 = c(1) + c(2)C_2 + c(3)C_3 + c(4)C_4 + c(5)C_5 + c(6)X_6 + c(7)C_7 + \varepsilon_1 \qquad [M_6]$$

$$C_5 = c(8) + c(9)C_1 + c(10)C_2 + c(11)C_3 + c(12)C_4 + c(13)Q_{3.21} + c(14)X_6 + c(15)X_8 + c(16)C_9 + c(17)C_{10} + c(18)C_{11} + \varepsilon_2 \qquad [M_7]$$

$$C_2 = c(19) + c(20)C_1 + c(21)C_5 + c(22)C_3 + c(23)C_4 + c(24)X_8 + c(25)X_6 + c(26)X_8 + c(27)C_{10} + c(28)C_{10} + c(29)C_{11} + c(30)C_{12} + \varepsilon_3 \qquad [M_8]$$

$$C_3 = c(31) + c(32)C_2 + c(33)C_4 + c(34)C_9 + c(35)C_{10} + c(36)C_{11} + c(37)C_{12} + c(38)C_{13} + \varepsilon_4 \qquad [M_9]$$

The endogenous variables of the model are those that measure transparency level, changes brought about in P.A. after political replacements, the degree of satisfaction of personnel in PA at their work, and the influence or extent at which other institutions can lead to diminishing corruption levels. The other variables appearing into the model are considered to be exogenous variables. The model with simultaneous equations described here above can be identified, because, in each equation, the number of excluded variables is bigger than the number of endogenous

variables. Parameters of the model described here above are calculated by the method of ordinary least squares in two stages (TSLS) and by the General Method of Moments (GMM). Thus, the two methods take into consideration the type of every variable within the model, whether it is an endogenous or an exogenous variable. Yet, mention should be made of the fact that this is not yet a generally agreed approach in selecting the list of pertinent variables for the models with simultaneous equations, used in the analysis of the four features of PA institutions; (Bai and Wei [2000] and Kaufmann, Kraay and Zoido-Lobaton [1999]).

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Table 1

Analysis of the quality of activities performed by PA institutions, function of corruption factors

	PA		CPA		CC		P		DS	
	Coef. of correlation	Parameters	Coef. of correlation	Para-meters	Coef. of correlation	Para-meters	Coef. of correlation	Parameters	Coef. of correlation	Parameters
Constant		4.208* (0.095) 4.209*T (0.092)		4.664* (0.296)		3.921* (0.142)		3.957* (0.254)		4.169* (0.119)
C5	–0.271*	–0.171* (0.028) –0.178*T (0.027)	–0.357*	–0.267* (0.085)	-	-	–0.329*	–0.262* (0.084)	–0.271*	–0.173* (0.035)
C9	–0.280*	–0.188* (0.029) –0.177*T (0.028)	–0.312*	–0.218** (0.092)	–0.425*	–0.305* (0.065)			–0.257*	–0.165* (0.036)
R^2		0.346 0.342T		0.411		0.425		0.329		0.331
F		55.146 55.15T		11.56		22.212		9.827		31.292
Number of valid cases		813 873T		116		102		85		510
Total number of cases		882 971T		134		113		89		546

* differs from 0 for a significant difference of 1%; ** 2%.

Table 2

Analysis of the quality of activities performed by PA institutions

	PA		CPA		CC		P		DS	
	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters
Constant		2.369*, (0.244) 2.398*T (0.237)		2.332* (0.794)		1.390* (0.380)		2.467* (0.449)		3.048* (0.242)
C3	0.336*	0.169*, (0.036) 0.179*T (0.035)	0.382*	0.262**** (0.131)	0.380*	0.230*** (0.099)			0.557*	0.196* (0.044)
C4	0.305*	0.209*, (0.045) 0.211*T (0.044)		0.396* (0.151)	0.434*	0.337* (0.126)				
C5	–0.207*	–0.096*, (0.029) –0.102*T (0.028)		–0.215* (0.100)			–0.301*	–0.158***** (0.048)	–0.275*	–0.117* (0.038)
C7	–0.235*	–0.061**, (0.025) –0.062** (0.025)							–0.320*	–0.107* (0.030)
X8	0.214*	0.099*, (0.035) 0.080*T (0.034)					0.348*	0.407* (0.117)	0.204*	0.083**** (0.043)

C10	–0.129*	–0.110**, (0.045) –0.102**T (0.044)	–0.232*	-0.329** (0.139)	0.190*					
C12	0.205*	0.170*, (0.046) 0.152*T (0.045)	0.230*		0.255*	0.200******* (0.111)	0.189***	0.368*** (0.167)	0.193	0.158* (0.057)
R^2		0.464, 0.211T		0.584		0.501		0.493		0.445
F		29.899, 30.684T		11.101		10.610		7.932		23.282
Number of valid cases		768, 808T		90		98		77		477

* differs from 0 for a significant difference of 1%; ** 2%; *** 3%; **** 5%; ***** 6%; ****** 8%.

Table 3

Model of analysis of corruption

	PA			CPA			CC		P	
	Coef. of correlation	Parameters M3.1PA	Parameters M3.2PA	Coef. of correlation	Parameters M3.1CPA	Parameters M3.2CPA	Coef. of correlation	Parameters	Coef. of correlation	Parameters M3.1P
Constant		3.080* (0.250)	3.621* (0.262)		4.273* (0.382)	4.485* (0.628)		3.805* (0.508)		3.990* (0.544)
C2	–0.323*		–.166* (0.034)	–0.464*	–0.292* (0.071)				–0.295*	–0.189*** (0.092)
C3	–0.222*	–0.081*** (0.039)							–0.258**	–0.239***** (0.128)
Q3.21	–0.183*	-0.053**** (0.031)		–0.323*	-0.266*** (0.093)	–0.231*** (0.104)				
C4	–0.185*		–0.095* (0.038)	–0.272*		–0.294***** (0.137)	–0.224****	–0.234***** (0.127)		
Q5.22	–0.193*	–0.099* (0.029)	–0.097* (0.028)	–0.317*		–0.146*** (0.087)	–0.164*****	–0.135***** (0.074)	–0.227*	
X6	0.232*	0.095* (0.025)	0.094* (0.024)	0.261*	0.118*** (0.056)	0.123*** (0.060)				
C7	0.277*	0.136* (0.031)	0.113* (0.030)	0.335*		0.156**** (0.081)				

X8	–0.195*	-0.107** (0.044)	–0.094*** (0.042)							
C9	0.257*	0.142* (0.034)	0.111* (0.034)	0.325*	0.162***** (0.089)		0.197*****	0.156***** (0.088)	0.269****	0.206*** (0.101)
C10	0.118*	0.113*** (0.053)	0.103* (0.052)							
R^2		0.438	0.460		0.581	0.528		0.224		0.421
F		21.210	24.721		12.889	7.795		4.96		5.245
Number of valid cases		744	744		105	105		95		76

* differs from 0 for a significant difference of 1%; ** 2%; *** 3%; **** 5%; ***** 6%; ****** 8%.

Table 3 (continuation)

	P			DS			
	Coef. of correlation	Parameters M3.2P	Parameters M3.3P	Coef of correlation	Parameters M3.1DS	Parameters M3.2DS	Parameters M3.3DS
Constant		3.843* (0.521)	4.747* (0.494)		3.262* (0.261)	3.436* (0.262)	3.254* (0.235)
C2	–0.295*		–0.189* (0.093)	–0.324*	–0.178* (0.044)	–0.188* (0.045)	–0.198* (0.045)
C3	–0.258****	–0.285*** (0.127)	–0.257* (0.129)				
Q5.22	–0.227*	–0.146**** (0.074)	–0.131* (0.075)	–0.142*			–0.069***** (0.038)
X6				0.249*	0.126* (0.031)		
C7				0.304*	0.152* (0.039)	0.157* (0.040)	0.162* (0.039)
X8				–0.197*	–0.114* (0.052)	–0.122** (0.053)	
C9	0.269****	0.223*** (0.100)		0.248*	0.106* (0.043)	0.136* (0.043)	0.137* (0.043)
R^2		0.417	0.407		0.451	0417	0.413
F		5.115	4.826		23.510	24.311	23.723
Number of valid cases		76	76		465	465	465

* differs from 0 for a significant difference of 1%; ** 2%; *** 3%; **** 5%; ***** 6%; ****** 8%.

Table 4

Analysis of transparency in PA

	PA		CPA		CC		P		DS	
	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters
Constant		0.414*** (0.218)		0.602 (0.640)		–0.541* (0.358)		0.157* (0.455)		0.555* (0.283)
C1	0.697*	0.703* (0.035)	0.763*	0.729* (0.094)	0.754*	0.723* (0.090)	0.593*	0.697* (0.127)	0.692*	0.669* (0.044)
C3	0.393*	0.124* (0.034)			0.412*	0.214** (0.081)			0.412*	0.141* (0.044)
C4	0.318*	0.106** (0.041)	0.444*	0.231** (0.131)					0.283*	0.083* (0.050)
C5	–0.368*	–0.112* (0.027)	–0.563*	–0.237* (0.084)					–0.360*	–0.107* (0.034)
X8					0.415*	0.216*** (0.095)	0.354*	0.248** (0.141)		
C10	–0.289*	–0.056** (0.021)							–0.356*	–0.069**** (0.028)
C11					–0.233*	–0.090*** (0.042)				
C12	0.238*	0.108**** (0.042)							0.279*	0.169* (0.054)
R^2		0.736		0.800		0.797		0.614		0.742
F		141.28		50.87		36.96		22.44		86.39
number of valid cases		725		89		98		76		430

* differs from 0 for a significant difference of 1%; ** 2%; *** 3%; **** 5%; ***** 6%; ****** 8%.

Table 5

Analysis of satisfaction at work for public officers in PA

	PA		CPA		CC		P		DS	
	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters	Coef. of correlation	Parameters
Constant		2.093*** (0.220)		2.976 (0.587)		1.098* (0.417)		2.839* (0.601)		1.773* (0.262)
C2	0.393*	0.183* (0.032)	0.489*	0.125* (0.070)	0.412*	0.155** (0.089)			0.412*	0.207* (0.040)
C4	0.364*	0.278* (0.044)	0.384*	0.268** (0.121)	0.462*	0.416** (0.119)	0.351*	0.345** (0.136)	0.353*	0.264* (0.052)
C5	–0.284*	–0.062** (0.031)	–0.458*	–0.143** (0.082)			–0.335*	–0.203* (0.087)		
X6	–0.209*	–0.086* (0.027)	–0.403*	–0.129* (0.076)	–0.257*	–0.158** (0.062)			–0.182*	–0.064* (0.033)
X7			–0.360*	–0.141** (0.082)	0.107*	0.206** (0.087)				
C7	–0.262*	–0.060* (0.023)								
C8	0.184*	0.041** (0.023)			0.287*	0.177** (0.064)			0.226*	0.079**** (0.027)
C9									–0.241*	–0.074* (0.039)
C10									–0.303*	–0.074* (0.029)

C11									0.127*	0.070* (0.032)
C12	0.150*	0.085**** (0.046)								
R^2		0.509		0.625		0.620		0.428		0.534
F		33.87		10.79		10.51		8.278		24.45
Number of valid cases		685		89		89		76		436

* differs from 0 for a significant difference of 1%; ** 2%; *** 3%; **** 5%; ***** 6%; ****** 8%.

Appendix 1

Aggregated variables of level 2 and 3 for defining econometric models

Nr. crt.	Variable	Definition of the variable	Number of aggregated variables	
			Level 1	Level 2
1	Quality of activities performed by PA institutions PA $-C_1$	Is a characteristic feature which takes into account three aspects connected to the way PA institutions work: if they know their objectives and their development strategy, their budget performance, and the quality of their relations with the beneficiaries of services supplied.	9	3
2	Transparency at the level of institutions in PA $-C_2$ or C_2'	Is a variable defining the existence, the implementation and monitoring of decision-making rules and the access of employees and beneficiaries to public information in the given institution.	5	2
3	Pressure exerted by the political system (X_6)	Measures the interference of the political system on the trade unions in PA, on the way in which jobs and promotion in PA institutions – either central or local – are obtained.	4	-
4	Changes in the system after political replacements or adjustments (X_7)	This variable is defined function of changes occurring after general or local elections, after changes of managerial teams in budget – paid institutions, or after changes of personnel policies in PA institutions.	3	-
5	Capability of Local PA to fulfil its basic functions (X_8)	Is a variable defined according to PA capacity to fulfill its main 10 functions recommended by its law: management of public assets, and of public assets supplied at local level, securing public health services, social assistance services, educational services, culture services, civil protection; to make forecastings for economic and social development, and to supply organizational capability for the above mentioned activities.	10	-
6	Satisfaction of employees working in PA (C_3)	Is a variable measured function of the satisfaction of employees on the following three points: average monthly income, the consideration shown for the work of civil servants by their colleagues, by the citizens, by the direct supervisor, by the Board of Management of the institution and by the conditions in which they perform their activities.	8	3

7	The quality of relations in the work process (C_4)	Is a variable defined function of the quality of relations of the civil servant with his peers, in his department or in neighboring departments, with his direct supervisor and with the General Manager, with the clients and the persons working in similar institutions and with whom he must communicate and work.	6	-
8	Level of corruption (C_5)	Is a variable measuring the level of corruption in the public sector, as it is being perceived by civil servants working in PA.	6	-
9	Consequences of corruption at social and economic levels (C_6)	Is a variable measuring the negative consequences of corruption in the economic and social development of a community (city, town, village) and of a series of national public services.	7	-
10	Influence of factors making corruption level decrease (C_7)	Is a variable measuring the influence of factors such as: the media, the educational system (schools, universities), the Church, the political parties, the civil servants and the citizens, in diminishing levels of corruption.	8	-
11	Fairness of competitions organized for getting jobs/ promotion in PA institutions (C_9)	Is a variable defining important aspects connected to access and promotion in Civil Service, as well as distortions or unfairness exerted through various channels, and poor organization of examinations.	8	-
12	The quality of the reforming process of Civil Service (C_{10})	Is a variable measuring the influence of reforming PA on important points of civil service, such as: employment of young people in PA institutions, increase of mobility for civil servants, the process of continuous training/development and the contribution made to diminishing corruption levels.	6	-
13	Personal characteristics $(C_{11} - C_{15})$	Sex of the person, male/female (C_{10}), years of age (C_{11}), type of employment/job: subordinated personnel, or executives (C_{12}), type of education of the person and level of studies: (lyceum, vocational schools, university degree, master, Ph.D.) (C_{13}), religion of the person (C_{14}) and type of institution where the person works (CPA, Prefectures, County Councils, Decentralized Services) (C_{15}).	-	-

Chapter 4

Non Academic Behaviour in the Public Health System

4.1. Introduction

Owing to their importance in ensuring political stability and economic development of a country, quantitative studies in the field of corruption hold a special place in contemporary economic research. Among the most important issues of research studies made in the field, we should mention:

(i) estimation of corruption facts at national level or for certain sectors of activity;

(ii) identifying causes of corruption and ways of transmitting it within an economic and social system;

(iii) measuring the impact of corruption on economic activities and social life.

The scientific community and researchers use a list of indices measuring corruption facts, each of them expressing various aspects of corruption. Among these, we mention types of indices used by International Country Risk Guide (ICRG), or by Transparency International (TI), such as the index of corruption, calculated by ICRG, or the index of corruption perception, used in TI analyses.

Among the most prominent studies, identifying causes and mechanisms of transmission of corrupted activities throughout the economic and social systems, we should mention research studies written by A. Krueger [1974], S. Rose-Ackerman [1975], Mauro [1995], Tanzi [1998] and so on. Speciality studies have identified four categories of factors with a direct influence on corruption level in a system: political and legislation factors, historical, socio-cultural factors and economic factors. Within the first category, we include the quality of the political system, the description of the legislation and institutions specialized in fighting corrupted activities, (see Leite and Weidmann (1999)), the quality of the democratic system, the particular aspects of the elections system in a country, the type of administrative system, the extent of decentralization of administration, and so on. A series of studies, such as those made by La Porta (1999), Treisman (2000), show the influence that traditions and historical events may have, on corruption level of a country, as well as on the ways in which corrupted events appear and are transmitted through various channels throughout the system. Social and cultural factors play a special part in corruption occurrence (see La Porta (1999), Treisman (2000), Alesina (2003). Equally, religious factors may have important contribution in propagating corrupted activities in a social system. Economic factors, such as the degree of openness of an economy, (see Dreher (2003), Treisman (2000), Wei (2001)), the size of the public sectors in an economy (see Tanzi (1998), Treisman (2000)), the size of remuneration in the public sector (see van Rijckeghem (1997)), all the above mentioned factors have a direct impact on level of corruption in a country.

Another important factor in studying corruption facts or activities is to choose the best suited econometric models for measuring their consequences on various sectors of activity. Among the most significant trends of research studying impact of corruption on economic and social environments, we should mention:

(i) measuring corruption consequences on economic growth, (see Mauro [1995], Abed and Davoodi [2000], Krueger [1974]);

(ii) consequences of corruption on development of a series of sectors in national economies, (see Tanzi [1998], Shang-Jin Wei [2001]).

(iii) effects of decentralization process on the level of corruption and on the ways of transmitting it throughout the system (see Shah [2006]);

(iv) consequences of corruption on systems of financing various sectors of activity, such as the military sector, Gupta [2001], and on public remuneration system (see van Rijckeghem [1997]);

(v) Impact of corruption on industrial policies of a country (see Emerson [2002], Bhagwati [1982]) and on the efficiency of investments projects (see Sarkar [2001], Mauro [2002]).

Most of the studies quoted hereabove, analysing impact of corruption on economy and on social life, at national, sectoral or regional level, use models of regression, models with simultaneous equations, VAR models and techniques of analysis of co-integrated series.

For instance, Kaufman (1999) and Andrei (2008) propose the use of models with simultaneous equations for estimating consequences of corruption on public administration reforming processes. In this particular case, variables under study are endogenous and exogenous variables, parameters examined are estimated through TSLS method (two stages least squares method) and by the general method of moments (GMM). The advantage of this last method as compared to regression models is the fact that it also makes estimations on the relation cause-effect, between various variables analysed.

In Romania, a series of estimations of corruption and of its effects on the reforming of public administration were made by Andrei [2008], Profiroiu [2005], Teodorescu [2007a]; also, studies on corruption in Romanian Universities were signed by Teodorescu [2006, 2007b]; analyses of corruption effects on the

quality of financing in a few activity sectors were signed by Andrei [2002] and Matei [2007], and by Andrei, Matei and Roşca [2008].

Identifying corruption as „non-academic behaviour" the present chapter describes a series of aspects perceived by the medical community (physicians with higher education), on a few aspects concerning level of corruption in the medical profession, and on the part played by some factors or institutions enabling penetration of corruption in the public health system. The chapter presents the methodology applied and a series of results obtained by using descriptive methods of analysis. An econometric analysis of the data series referring to corruption in the public health system is given in the next pages. All calculations are made by using SPSS statistics programme.

By using this approach, a series of channels through which corruption propagates throughout the system are identified. Among the most important channels, we should mention:

- The general practice of replacing managers and Boards of Directors in the public health system on political criteria.
- Existence and implementation of a wrong legal framework, which enables and allows occurrence of corrupted activities in the public health system.
- Defficiencies in the remuneration system of the medical profesion, which does not motivate doctors and medical personnel to perform a work of quality.
- Pressures put by the economic environment and by the business environment, on hospitals administrators or managers.
- Behaviour of the patients, who encourage a non-academic behaviour of doctors and medical personnel.

Our study estimates a series of aspects connected to corruption facts in the public health system, such as: trends in corruption during the lapse of time that elapsed from the elections; the optimism showed by the medical personnel on reducing corruption levels after Romania's integration to the EU; the opinion of physicians on the contribution made by some institutions to reducing levels of corruption.

4.2. Non-academic behaviour in the public health system

4.2.1. Series of data used in the research

In order to collect data necessary to the survey, the sampling was done in two stages: first interviews were conducted in the public health units in Bucharest (hospitals, health centres) considered as primary sampling units. The second step was a sample of doctors, selected from each primary sampling unit.

The volume of interviewed persons in the capital Bucharest was of 407, accuracy of the results of the survey is of 95%, if we take into consideration an error of ±2.5% in the correctness of the sampling.

The sample comprised three categories of medical personnel, as follows: family doctors – 75, doctors working in hospitals – 279 and doctors working in health centres – 53.

4.2.2. Defining aggregated variable of first degree

A mechanism of corruption in a public institution has in its structure, among other elements, the personnel employed in that institution. This is why, in a corrupted system, where State budgeted institutions react to the pressure put on them by the political and economic environment, political changes resulting after changes made by elections bring about important changes of the technical personnel working in the administration of State – financed institutions.

We are sure that in a corrupted system, changes of management personnel in public institutions are very frequent. Appointment of high-position jobs on political criteria is a factor of corruption, but also a measure of the corruption of the system in a given society.

Because of these reasons, the questionnaire included a few questions estimating the opinion of doctors on replacement of hospitals and health centres management on political criteria. This section of our study presents three aggregated variables of first

degree, used to measure specific aspects of corruption in the medical profession, but also in the whole Romanian society. The three aggregated variables make estimations on the following points: replacement of management boards in hospitals and health centres, because of political changes; describing changes in the whole public health system, after political changes; assessing the opinion of the medical profession on the level of corruption in their system.

A. Replacement of management boards in hospitals and health centres on political criteria

In order to estimate at what extent political factors interfere in replacing management boards on political criteria, the primary variable SCP was defined, based on the following formula:

$$SCP : P \rightarrow [1, 4]$$

Primary information used in this case are obtained after processing the data series obtained by answers to section 4.1.

For the definition of this parameter a measuring scale of four values is used, as follows: 1 is the situation when the person interviewed considers that in his institution there were no replacements made on political considerations, in the board of management; 2 is the value given when the person interviewed considers that such changes occurred indeed, but they are not a current practice; 3 is the value given when changes on political criteria, of the management board are quite frequent; 4 is the value given when the person interviewed considers that the replacement of the management board, on political criteria is the general rule. In this last case, any political change in the society causes a change of the management boards in public health institutions.

A value higher than 3 of the average scored by this variable shows a significant instability of management boards of public health institutions, after political changes in the Romanian society. This situation can lead to augmenting corruption levels and to bad management of public health institutions.

B. Changes in the system caused by political replacements

For estimating changes in public health institutions, resulting after general elections, the next 5 aspects were considered: Management of the public health system, a general overview (A23_1); System of remunerating personnel working in the public health institutions (A23_2); The budgetary management of the institution (A23_3); The management of services within the institution (A23_4); Ways of recruitment of personnel working in the system (A23_5).

For measuring the opinion of doctors on each of the above mentioned criteria, a scale of measure with five values was used, as follows: 1 is given for the situation when the person interviewed considered that there were no changes in the system; 2 is given when the person interviewed considers there were minor changes; 3 is given if the changes were significant; 4 if changes were important; value 5 is given when the person interviewed considered that changes in the system were essential.

For an overall estimation of changes in the public health system, after local elections in 2004, an aggregated variable of 1st degree is defined, based upon the following formula:

$$SSS : P \to [1, 5],\ SSS_i = E(A_i 23\_1, ..., A_i 23\_5). \qquad [1]$$

C. Evaluation of the corruption levels

In order to evaluate perception of doctors on corruption levels of certain systems, a measuring scale in five steps was used, defined as follows: value 1 is given if the person interviewed considers there is no corruption in the system under study; value 2 is given if the person considers corruption is insignificant; value 3 is given for the case the person interviewed considers that corruption exists, at moderate level; value 4, is given if the person interviewed considers corruption level is high; value 5 if the person perceives corruption as a general and essential practice in the system under study.

The questionnaire included in section 4.3, five questions measuring corruption levels in the following fields: public education; public health; politics; public administration; in the institution where he/she is working.

For an overall estimation of corruption levels, an aggregated variable of 1st degree is defined, measuring the levels of corruption in public education, public health, public administration and in the institution where he/she is working; the variable measuring political behaviour is not taken into consideration, since it is presumed from the very beginning that inadequate behaviour of the political parties is inducing corruption in all the other systems under study.

If we had included in the structure of corruption index (COR), the value of the data series measuring corruption of the political parties, (value of the primary variable A24_3), this would lead to an overestimation of the levels of corruption, because of the following points :

– political parties are able to induce corruption in the four systems under study, and the four primary variables are measured by answers to questions included in the questionnaire;

– the perception of the society on the quality of political parties is completely negative.

In this situation, the variable used for measuring the level of corruption in the Romanian society, in the opinion of the medical profession (doctors with higher education), is calculated as follows:

$$COR : P \rightarrow [1, 5],$$

$$COR_i = E(A_i 24\_1, A24\_2, A24\_4, A_i 24\_5). \quad [2]$$

4.2.3. Descriptive analysis of the data series

Distribution of answers to the question of section 4.1 is given in the table below. The histogram defined for the series of data of variable SSS is given in Fig. 1.

Table 1

Distribution of value for variable SSS (%)

Answers	Frequencies	Frequencies cumulated ascending
	10.6	10.6
Never	33.2	43.7
Sometimes	28.5	72.2
Often	14.0	86.2
Always	13.8	100.0
Total	100.0	

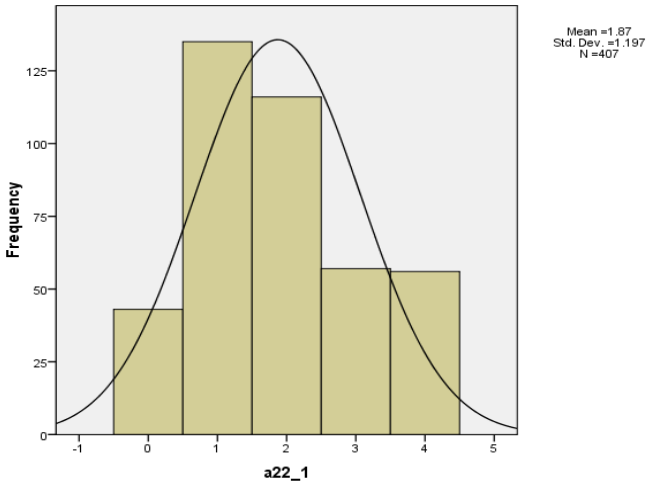

Fig. 1. *Histogram of the series of data for variable SSS*

The average value calculated for a number of 364 questionnaires that gave correct answers to question in section 4.1 equals to 2.09 (for a square standard deviation of 1.066). Results hereabove show a relatively moderate trend in replacement of management boards in public health, on political criteria. Among persons answerring that question, 31% considered that replacement of managers on political criteria is really a problem (we included here persons that answered “often” and “always” to question of section 4.1).

Perception on replacement of management boards in hospitals and health centres does not differ for groups of doctors defined function of sex, age, or university degree. But it differs function of the personnel category (perception of executives differs from perception of subordinated personnel). Using an analysis of dispersion of doctors in the survey - ANOVA, we calculated a value for statistics F= 3.63 for a significant difference of 0.003. Average values and standard deviations of parameter SSS, function of categories of personnel are given in Table 2.

Table 2

Analysis of opinion concerning replacement of management boards, function of personnel category

Total	Executives	Specialist doctor	Primary doctor	Resident doctor	Other category	Statistics F
2.09 (1.066)	1.96 (1.126)	1.83 (0.991)	2.29 (1.144)	2.22 (0.832)	1.40 (0.699)	3.63 (0.003)

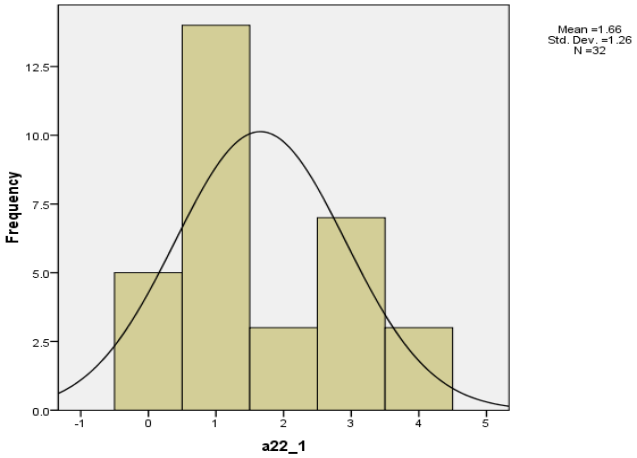

Fig. 2. *Histogram of data series for variable SSS for executives*

Distribution of answers for doctors holding managerial positions is given in fig. 2. For this particular category of

personnel, dispersion of answers is the following: 15.6% didn't answer the question; 43.8% consider that they never knew a case of replacement of an executive for political reasons; 9.4% considered that such changes happened sometimes; 21.9% considered such changes are frequent; 9.4% considered that replacement of management boards on political criteria is the general rule. Distribution of answers to questions of section 4.3 is given in Table 3.

Table 3

(%)

	No answer	There is no corruption	Corruption exists, but is not significant	Moderate level of corruption	High level of corruption	Corruption is general in the system
1.Education	3.9	2.5	21.4	41.5	20.1	10.6
2. Public health	3.4	1.7	20.9	36.6	25.6	11.8
3. Political parties	4.2	1.2	2.0	9.8	36.6	46.2
4. Public administration	4.2	1.2	4.4	14.7	46.4	29.0
5. Corruption in your institution	5.4	17.0	37.6	24.1	10.8	5.2

Table 4

(%)

	No answer	There were no changes	Changes were moderate	Changes were significant	Changes were important	Changes were essential
1. Management of public health system. in general lines	5.9	21.4	42.3	18.7	7.9	3.9
2. System of remuneration of personnel in public health	6.1	45.9	40.3	5.4	1.7	0.5
3. Budgetary management in the institution	7.1	39.1	41.5	9.1	2.7	0.5
4. Management of services within the institution	7.1	39.3	39.8	10.3	2.2	1.2
5. Employment of personnel	7.1	47.2	35.1	6.9	1.5	2.2

Levels of corruption for various sectors, in the opinion of doctors working in the public health system is given in Table 5. Only those questionnaires which gave valid answers to the 5 questions were taken into consideration in data processing, that is 375 valid answers, as follows.

Table 5

Levels of corruption for sectors of activities

Education	Health	Political activities	Public administration	Institution where he/she is employed
3.16 (0.975)	3.28 (0.992)	4.29 (0.840)	4.02 (0.866)	2.47 (1.081)

* Figures in round brackets beneath represent the square standard deviation.

For ensuring comparability of data obtained by our analysis, with data used by Transparency International - Corruption Perception Index, we used the following transformation of data:

$$\text{Index of corruption (TI)} = 2(5 - \text{Index of corruption}) \quad [3]$$

A low value for TI index means a high level of corruption within the system. The domain of values of this index is from 1 to 10. When processing the data, we should bear in mind that for year 2007, corruption level in Romania, measured by the methodology proposed by Transparency International is 3.7, which means that Romania is on place 30, in European countries. The reliability interval for these figures is (3,4 4,1). In a world wide classification, Romania is on place 69.

If we made the above transformation, we obtained results in the table below, for each sector of activity considered.

Table 6

Levels of corruption on Transparency International scale

Education	Health	Political	Public Administration	Institution where he/she works
3.78	3.44	1.42	1.96	5.06

Index of corruption, calculated considering data collected from the sample under survey, presents the following characteristics:

- Value of corruption index, calculated as an average of the aggregated variable COR, defined as shown in application [2], equals to 3.23, and the standard deviation is 0.759. For calculating the medium level were used the results of the questionnaires, 375 of them giving valid answers to all 5 questions that described variables.
- Index of corruption, calculated after transformation [3] equals to 3.52, value that can be placed in the range of confidence of the Index of Corruption Perception, calculated according to the methodology used by Transparency International.
- Distribution of corrupted activities, defined by the data series of the variable COR, is symetric.
- Figures show significant disparities between the distribution curves of variable COR (see graphs in figure [3]). Quite similar profiles are scored for series of data in public education and public health system, and administration and political domain, respectively. As a matter of fact, for health and education systems, and public administration and political activities, value scored by the processing are almost equal.

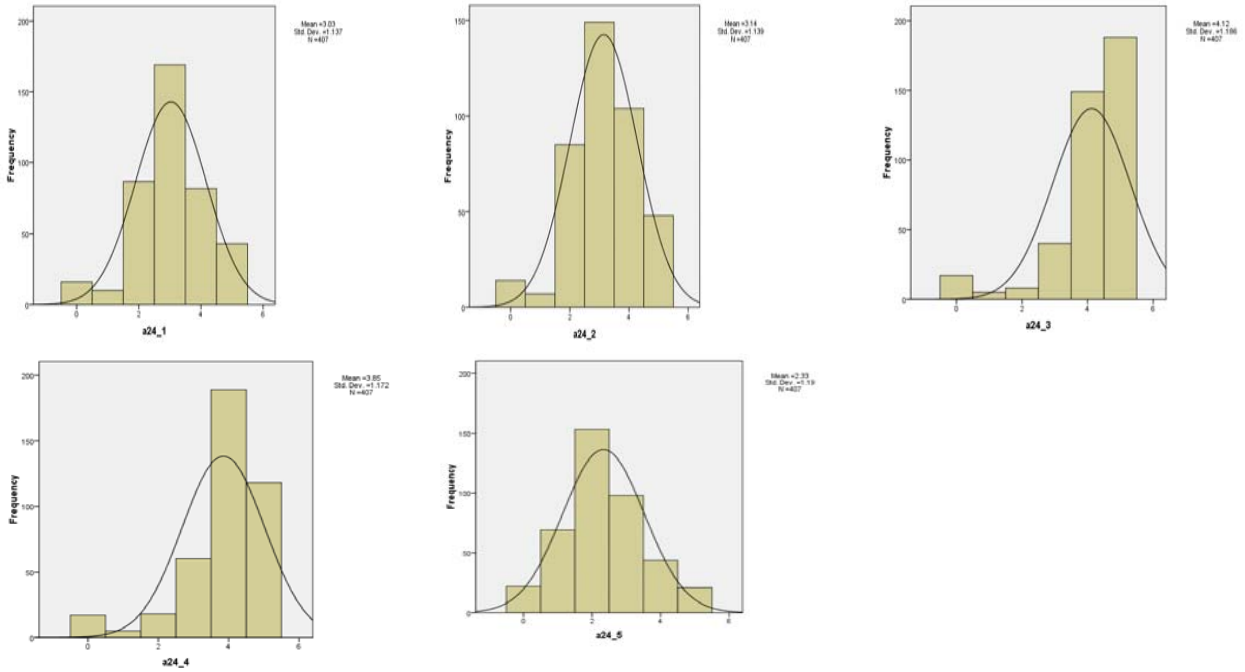

Fig. 3. *Distribution of answers for levels of corruption in some sectors of activity*

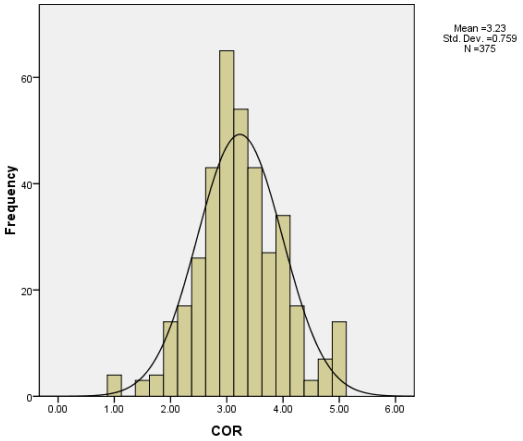

Fig. 4. *Distribution of data series for variable COR*

Analysis of corruption perception for groups of persons defined according to various criteria of classification leads to the following conclusions:

- Corruption perception differs for various groups of doctors, defined function of their sex, male or female. Male population considers lower levels of corruption than female population. Results scored for the two groups interviewed (doctors - men; doctors – women) are shown in Table 7.

Table 7

Indices of corruption for groups of doctors (men; women)

	Men	Women	Total of population	Statistics F
COR (second relation)	3.11 (0.876)	3.29 (0.690)	3.23 (0.759)	3.23 (0.03)
Index of corruption (TI)	3.78	3.42	3.52	-

- For groups of doctors described function of other criteria (age, category of personnel, and university degree) there are no significant differences on perception of corruption facts.

4.3. Factors leading to lowering corruption levels

4.3.1. Defining aggregated variable of 1st degree

For estimating which factors contribute to maintaining corruption within the system, our questionnaire included five questions, for section 4.4. The following five factors are taken into consideration: the legal framework (A25_1); the system of remuneration (A25_2); the pressure put on the profession by the environment (A25_3); the pressure put on the profession by the political system (A25_4); the behaviour of the patients (A25_5).

An important component of studies on corruption is to identify those factors that maintain corrupted activities within the public health system, and the measuring of their proportion.

For measuring the opinion of doctors on the influence played by each of these five factors in propagating corruption within the public health system, we used a measuring scale in five steps, as follows: 1 is given when the factor considered has a major influence in propagating corruption within the system; 2 is given if the factor considered has a quite important influence in propagating corruption; 3 is given if the influence of the factor is moderate; 4 is given when the factor considered has very little influence on propagating corruption throughout the system; 5 is given when the factor considered has no influence at all, on propagating corrupted activities throughout the system.

Our study took into consideration only these 5 factors, for the following reasons:

- Specialized studies in the field consider that these factors are the most important, in evaluating corruption within a public health system;

- The same factors are used in evaluating institutions and for public education. Under these circumstances, results obtained can be compared for each domain of activity.

For a global analysis of the influence played by these factors in fighting corruption, we defined variable FLC (factor fighting corruption), on the basis of the following application:

$$FLC : P \to [1, 5],\ FLC_i = E(A_i 25\_1,..., A_i 25\_5). \quad [4]$$

An important aspect in analysing corruption facts is the perception of its progress in the lapse of a given governance period, or the comparison made between corruption levels for two governance periods. While analysing corrupted activities, we took into account the fact that index of corruption shows the way in which corruption is perceived by a certain population or by a profession. Level of corruption perceived by a person is based on the person's experience, in the society where he/she is living and working, but also this perception can be modified by factors such as: the media, the behaviour of responsible political representatives of organizations fighting corruption and ensuring social justice, and so on.

Our questionnaire included two questions measuring perception of doctors on corruption levels in their profession, in the most recent period (question of section 4.5) and their opinion on corruption after Romania's integration in the EU (question of section 4.6).

On the basis of answers to these two questions, we considered two primary variable symbolized by ECU and CPA. These two variables were defined on the basis applications below:

$$ECU, CPA : P \to [1, 5] \quad [5]$$

For measuring the two primary variables, we used a measuring scale in five steps, as follows: value 1 is given if the people interviewed consider the level of corruption has increased/will increase significantly; value 2 is given if the person

considers corruption has increased/will increase; value 3 is given if the person considers corruption hasn't changed essentially/will not change essentially; value 4 is given if the person considers corruption level has decreased moderately/will decrease moderately; value 5 is given if the person considers level of corruption has decreased significantly/will decrease significantly.

Institutions such as media, schools and educational system, the Church, can play an important roll in augmenting or decreasing corruption levels within a society. Because of this reason, our questionnaire included in section 4.7, six questions that measure the opinion of doctors on a few factors that could reduce levels of corruption, in the last period of time. Therefore, our study took into consideration the following elements: Media (A24_1); Schools (A24_2); the Church (A24_3); the political parties (A24_4); Civil servants (A24_5); Citizens, when they are patients for the medical care (A24_6).

For measuring the opinion of doctors interviewed, on the role played by each of the six elements in reducing levels of corruption, we used a measuring scale in five steps, defined as follow: 1 is given if the factor analysed plays a negative role in fighting corruption; 2 is given if the factor analysed has a moderately negative role in fighting corruption; 3 if the factor considered has no influence in reducing corruption in the system; 4 if the factor considered has a moderately positive role in fighting corruption; 5 if the factor considered has a positive role in fighting corruption.

In order to define an overall assessment of the role played by all the 6 elements mentioned above in reducing corruption levels (RCO,) we defined the variable RCO, based on the application below:

$$RCO : P \to [1, 5],\ RCO_i = E(A_i 24\_1, ..., A_i 24\_6). \quad [6]$$

An average value of this parameter higher than 4 on our scale, proves an active role of the elements mentioned above in reducing corruption levels.

4.3.2. Descriptive analysis of data series

Factors influencing corruption

There is no a general model of facts causing corruption to appear, and the contribution of various factors to making corruption appear differs very much from one field to another. For the public health system, we took into consideration five important factors.

A first major factor is the legislation and the legal standards of the medical profession, which allow corruption to appear at all levels of the hierarchy in the public health system. Lack of consistency and confusion in the legislation allow for developing corrupted mechanisms in the Ministry of Public Health, in agencies, hospitals and departmental health care institutions.

An important element in maintaining corruption in a public system is the lack of a motivation system for the profession, and especially the poor quality of remuneration of the medical profession.

The pressure put by the economic environment and by the political environment are also important factors that cause corruption to appear at all levels of the public health system. Among the most important channels propagating corruption throughout the system, caused by the above mentioned two factors, we mention: biased competition between providers of medical services, allocation of public funds only in certain preferred directions of health-care programmes, promotion of personnel on executive positions, and so on.

Another important element connected especially to corruption in hospitals, dispensaries and health centres is the habit of offering presents to medical personnel and, in our case, the fact that some questionnaires do not answer the question regarding satisfaction degree of personnel interviewed.

Table 8 presents relative frequencies of answers referring to contribution made by these elements to augmenting corruption in the public health system. The questions do not focus on corrupted events occurring at a given level of the system; for the five distributions we made estimations on indices that measure the average level of corruption, the variance, the asymmetry and the leveling of the curves. Values scored on the basis of our data are presented in Table 9. For each particular case we also specified the number of values in the data series.

Table 8

Distribution of answers on contribution of factors that allow corruption occurrence (%)

	No answer	At a large extent	Quite much	Moderate	Insignificant	Not at all	Total
1.Legal framework	5.7	22.9	18.2	25.3	20.4	7.5	100.0
2. Remune-ration system	2.9	64.9	21.6	6.6	2.2	1.7	100.0
3. Pressures put by the economic environment	5.4	33.7	29.2	19.9	9.3	2.5	100.0
4. Pressures put by the political system	6.4	24.6	22.1	20.6	19.4	6.9	100.0
5. Behaviour of patients	4.9	16.7	19.4	26.8	20.9	11.3	100.0

Table 9

Distribution of answers on contribution of some institutions in reducing corruption levels (%)

	No answer	Negative	Moderately negative	No influence	Moderately positive	Positive	Total
1. Media	3.2	12.3	9.8	17.9	44.5	12.3	100.0
2. Schools	3.4	5.4	5.7	38.3	35.4	11.8	100.0
3. Church	3.9	4.2	3.7	50.1	26.3	11.8	100.0
4. Political representatives	3.2	42.8	25.6	10.6	9.8	8.1	100.0
5. Representatives of the Government/civil servants	3.2	34.6	29.0	12.8	11.8	8.6	100.0

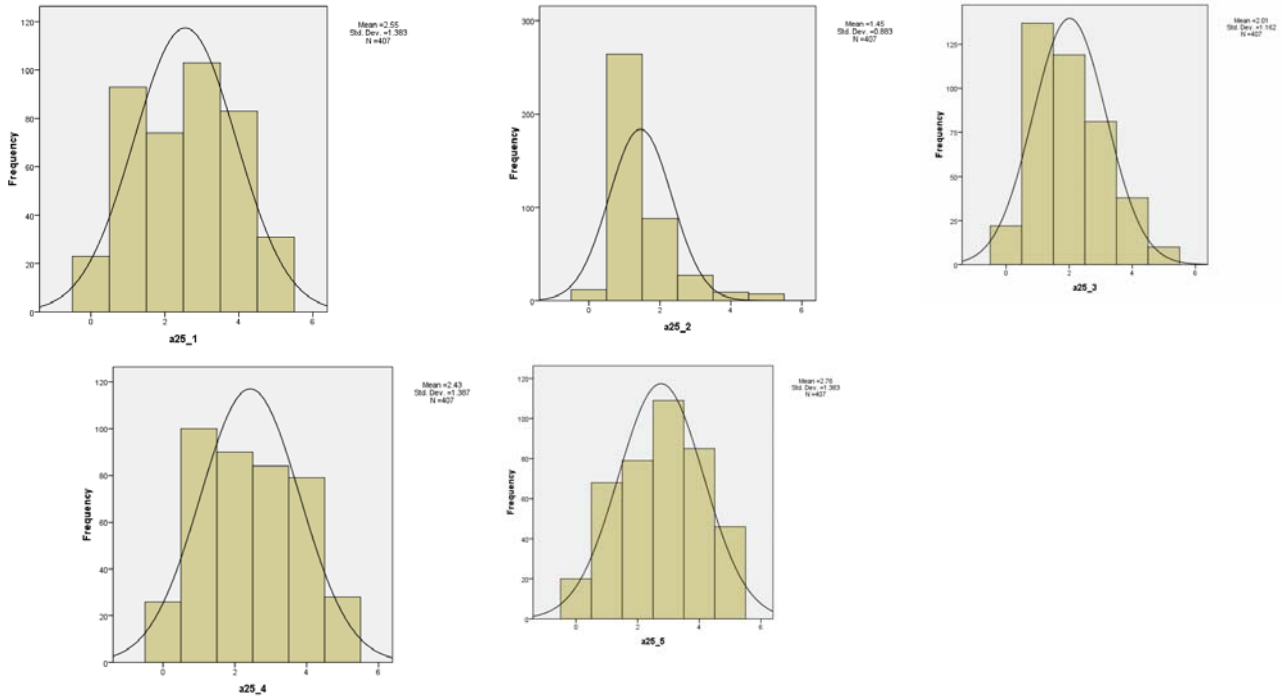

Fig. 5. *Distribution of answers on factors contributing to corruption*

Table 10

Characteristics of distributions of factors contributing to corruption occurrence

Variable	Number of observations	Average	Standard deviation	Skewness	Kurtosis
A25_1	384	2.70	1.271	0.101	-1.092
A25_2	395	1.50	0.859	2.056	4.375
A25_3	385	2.13	1.087	0.694	-0.344
A25_4	381	2.59	1.275	0.246	-1.096
A25_5	387	2.90	1.264	0.015	-1.003

For the global analysis of the role played by the five factors in contributing to augmenting corruption in the public health system, we defined the aggregated variable of first degree, FLC, based on formula [4]. After processing data series defined for this variable, we obtained the following results:

- The histogram of data series is presented in Figure 6.

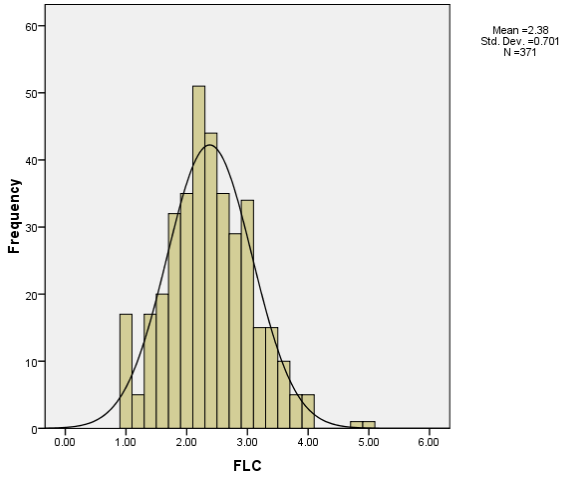

Fig. 6. *Distribution of values for variable FLC*

- Indices calculated for measuring distribution of the data series are given in Table 11.

Table 11

Indices calculated for defining the distribution of data series FLC

Number of cases	Average	Standard deviation	Skewness	Kurtosis
371	2.38	0.701	0.276	0.239

We applied the student test in order to find out if the average level of variable FLC differs in a significant way from 2, respectively 3. The values of statistics t-Student equal to -17.10 respectively 10.39 (0.00) prove this, and consequently, we can see that factors taken into consideration have a major contribution to increasing corruption in the system. Among these factors, the most important is the remuneration system of doctors working in the public health system and the pressures put on it by the economic environment and by the political environment. The other factors taken into consideration by our statistics have a more than moderate contribution to increasing corruption of the system. Also, the behaviour of the patients has its role in allowing corruption throughout the system

- When analyzing group of doctors defined function of their sex, male/female, age of the person, category of personnel and university degree, there are no significant differences on perception of the factors inducing corruption through the system.

Elements contributing to reducing corruption levels

Table 12

Characteristics of distributions for factors contributing to corruption occurrence

Variable	Number of observations	Average	Standard deviation	Skewness	Kurtosis
A28_1	394	3.36	1.205	-0.716	-0.477
A28_2	393	3.44	0.973	-0.541	0.401
A28_3	391	3.39	0.908	-0.219	0.634
A28_4	394	2.12	1.304	0.963	-0.285
A28_5	394	2.28	1.304	0.763	-0.594
A28_6	394	2.90	1.179	0.029	-0.972

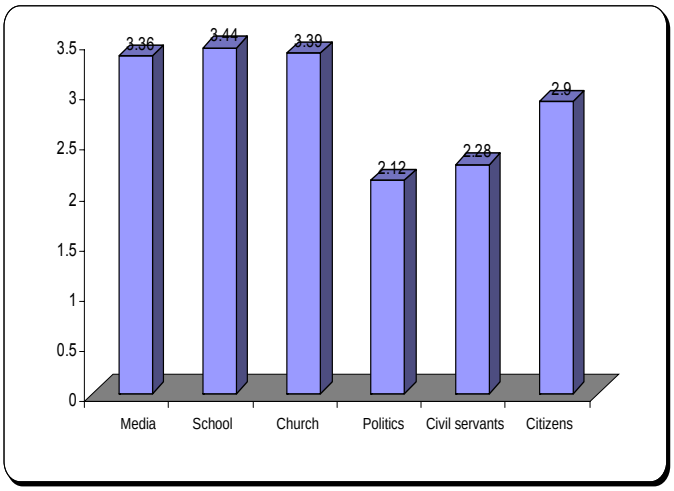

Fig. 7. *Contribution of factors to reducing corruption levels*

Results in Table 12 and Figure 7 prove the following:

- Three institutions, schools, the media and the Church really contribute to reducing corruption within a society. The averages obtained for variable FLC, for the three institutions under survey differ significantly from value 3.
- The behaviour of the political representatives and of civil sevants has a moderately negative influence on reducing corruption levels within the system. We must specify that the average value calculated for the political class differs significantly from 2 (value of statistics t-Student is 3.79, for a significant difference of 0.00).
- The behaviour of citizens, when they become patients of health care institutions, cannot influence the trends of corruption in a significant way. Under these circumstances, the citizen as such either loses, when corruption increases, or is well treated, when corruption levels decrease.

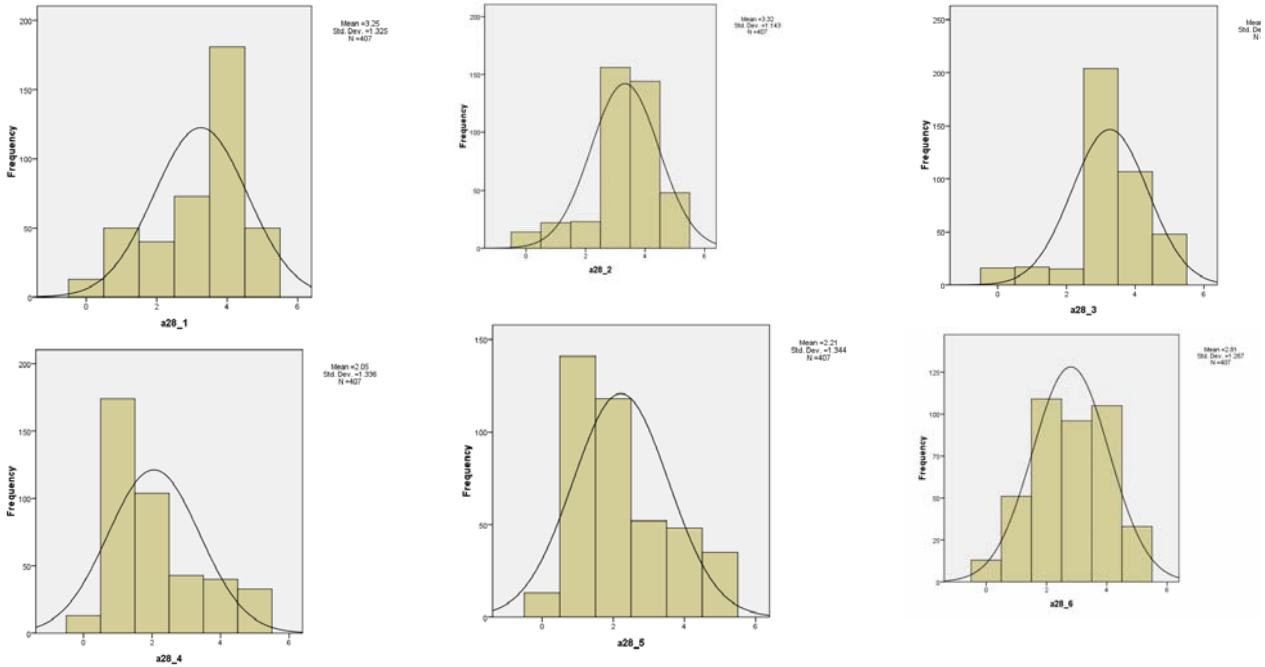

Fig. 8. *Distribution of answers on contribution made by institutions to reducing corruption*

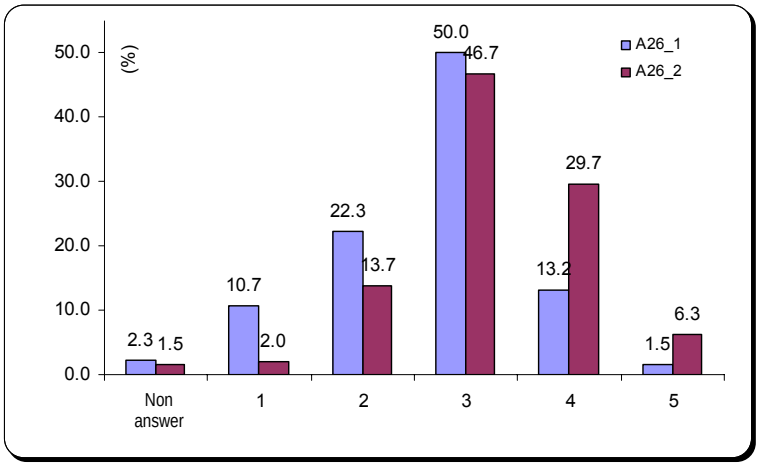

Fig. 9. *Opinion of doctors on corruption trends in the last period of time and after integration to EU*

For the two variables ECU and CPA that we used for measuring the opinion of doctors in the last period, and in the period after Romania's integration to EU, we calculated average values. For interpreting the two values, we must take into account the measuring scale used for defining the two variables. The following lines show a series of characteristics of the two variables. Our study used only the 388 questionnaires that gave valid answers to the two questions asked:

- The average level of the two variables considered is: 2.72 (the standard deviation is 0.887) for ECU and 3.26 (standard deviation of 0.843) for variable CPA. The two variables differ significantly of 3. Under the circumstances, we can conclude that lately, corruption increased moderately, and for the next period of time, it will decrease moderately;
- The linear coefficient of correlation, calculated for the two data series corresponding to each variable, equals to 0.638 and differs significantly from 0, for a significant difference of 0.01.

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Chapter 5

Simultaneous Equations Models used in the Study of some Issues Related to the Corruption and Performance of Services in the Public Health System

5.1. Introduction

Reform of public health is a complex and lengthy process, which involves different types of institutions and individuals. During the transition, actions undertaken by all governments have pursued solving the current problems and not to define a new philosophy of the public health system. Under these circumstances, public health system has become expensive and often nonfunctional. Not a few times, inefficient solutions have been chosen for solving problems in the health system, both in terms of professional, but also economically. The networks of health services providers from Romania, currently do not respond to most needs to improve the health of the population.

In the past eighteen years, a series of measures have been undertaken to decentralize the system and to the privatization of medical services. However, currently we assist to a fragmentation

of the system, which emphasize the inequality in the distribution of medical personnel and a reduction of it to certain types of medical services. We note that the number of doctors per capita in the rural area is now only 20% of those in urban areas. Another major shortcoming is related to the financing and linking it with the strategies of decentralization. Not a few times, decentralization appeared as a way of placement of the tasks from the central level to local administrations.

5.2. Model definition

General Presentation

In the economic literature there are a number of applications of the simultaneous equations models for the analysis of the phenomena in the social field, under the condition that estimates of the parameters are obtained using data series from the application of statistical surveys. We mention in this regard (Kaufmann, 2002), (Bai and Wei, 2000), (Kaufmann, et al., 1999), (Andrei, 2008), etc. For example, the last paper quoted defines a simultaneous equations model for the analysis of some phenomena at the level of public administration. By this model four important aspects of the functioning of public administration are analyzed: the performance of institutions of central and local administration, corruption, transparency of decisions and satisfaction of employees.

The major problem using simultaneous equations models, which use data from a sample, is related to the definition of the instrumental variables list used in estimating the model parameters by applying the two stages least squares method. We point out that in the economic literature there is no uniform approach in choosing the list of instrumental variables in the simultaneous equations models used to analyze certain aspects of public administration (Bai and Wei, 2000) and (Kaufmann et al., 1999).

In the following, starting from a set of assumptions, we define the equations of the simultaneous equations model used to analyze some important issues related to the progress of the reform process in the public health system.

Model assumptions

For the simultaneous equations model used to analyze the process of reform of the public health system we will take into account a series of working hypotheses, defined as follows.

Hypothesis 1. The perception of the reform by the medical staff with higher education in the public health system is viewed from the perspective of the following aspects: quality system of funding public health system, measures taken to reform the medical institutions, the quality of the decentralization of the health system, the characteristics of the medicines procurement system and the quality of employment and promotion of staff in the public health system.

Hypothesis 2. The reform process in the public health system will determine, in an average time horizon, changes in national policy of public health system viewed from the perspective of increasing the volume of public expenditure for health, the policy of national programs carried out by the health ministry and the increase of the transparency in the usage of public funds for compensate and free drugs in the primary medicine.

Hypothesis 3. The reform process should support measures increasing the public health education to prevent illness and aggravation of a disease.

Hypothesis 4. The results of the reform process are perceived by reducing the level of the corruption in the public health system.

Hypothesis 5. The process of reform should be transparent.

Hypothesis 6. Statistical data used to estimate the model parameters are obtained from the application of a questionnaire to statistical medical personnel sample.

Model equations

The models equations are defined using the above assumptions and the structure of the questionnaire applied to medical personnel.

The **first equation** describes the quality of reform in the public health system (RSS) depending on various characteristics

which are grouped as follows: characteristics of the functioning of the institutions, such as the quality of the factors affecting the achievement of a quality medical act (CF) and the assessment of the institution and employees (CSE); ministry transparency in making decisions related to the progress of the reform process (TMS); ministry policies in the field (PDS); health education of the population (ESP); personal characteristics of the person interviewed, including the gender, age and category of medical staff. Personal characteristics are defined on the basis of variable vector VP. We define the first equation as follows:

$$RSS = f_1(CF, CSE, TMS, PDS, ESP, \mathbf{VP}) + \varepsilon_1 \quad [1]$$

The ε_1 variable is uncorrelated with explanatory variables in the regression model, being homoscedastic. The f_1 function is a linear combination of explanatory variables. Under these conditions the regression model used to analyze the quality of the process of reform in the public health system is defined as follows:

$$RSS_i = a_0 + a_1 CF_i + a_2 CSE_i + a_3 TMS_i + a_4 PDS + a_5 ESP_i + \mathbf{a_7 VP} + \varepsilon_{1i} \quad [2]$$

where $\mathbf{a_7}$ is a line vector with the three elements, and $\mathbf{VP}$ is a column vector with three elements.

The **second equation** estimates the role played by different factors in increasing the transparency of decisions in the public health system (TMS). Moreover, the increase of the decisions transparency plays an important role in the progress of the reform process. The second equation of the model analyzes the influence of some factors in the public health decisions on transparency in the system. The following factors are taken into consideration: factors related to ministry policy in the field (PDS); the quality of the reform process (RSS); the level of corruption at the national level (COR); a series of personal characteristics of the person, such as the gender, age and category of staff (VP). The second equation is:

$$TMS = f_2(PDS, RSS, COR, \mathbf{VP}) + \varepsilon_2 \quad [3]$$

The ε_2 variable is uncorrelated with explanatory variables in the regression model, being homoscedastic. The f_2 function is defined as a linear combination of explanatory variables. The regression model for the analysis of the quality of the reform process in the public health system is defined based on the relationship below:

$$TMS_i = b_0 + b_1 PDS_i + b_2 RSS_i + b_3 COR_i + \mathbf{b}_4 \mathbf{VP} + \varepsilon_{2i} \quad [4]$$

where $\mathbf{b}_4$ is a line vector with the three elements, and $\mathbf{VP}$ is a column vector column with three elements.

The **third equation** estimates the influence of some factors from the public health system in increasing health education of the population. In defining this equation we start from the fact that optimizing the costs of health is not possible without direct participation of the beneficiary who is the citizen. Under these conditions, to obtain positive results and a sustainable development a national strategy is necessary to ensure public health education to prevent illness and aggravation of a disease, to request a new medical check at the end of medical treatment, etc.

This equation examines the health education of the population (ESP) depending on various factors, such as factors related to direct the behavior of patients, including a number of variables, such as the frequency of the application of a new medical control at the end of a period of treatment (PCS) and the extent to which people give sufficient importance to their health (PAC); factors related to the accessibility of the citizens to the primary, secondary and tertiary health care (ACS); factors related to decisions of the management of the Ministry of Health regarding education programs for the health of the population: the contribution of institutions such as Ministry of Health, Ministry of Education, medical units, the media, to the development of the health education and prevention of illnesses among the population (DPE); the usefulness of the development of health education and

prevention programs among the population (UDP). The third equation is:

$$ESP = f_3(PCS, PAC, ACS, DPE, UDP) + \varepsilon_3 \quad [5]$$

The ε_3 variable is uncorrelated with explanatory variables in the regression model, being homoscedastic. The f_3 function is defined as a linear combination of explanatory variables. The regression model for the analysis of the quality of the reform process in the public health system is defined based on the relationship below:

$$ESP_i = c_0 + c_1 PCS_i + c_2 PAC_i + c_3 ACS_i + c_4 DPE + c_5 UDP + \varepsilon_{3i} \quad [6]$$

The **fourth equation**. The corruption and nonacademic behavior from the public system in general and in the public health system in particular have an important contribution in the implementation of the reform process in the system and in the improving the quality of the medical act. This equation estimates the contribution of some factors in reducing the corruption (COR), such as the features of the reform process (RSS); the system for evaluating the quality of services (CSE); the transparency of the decisions, the accessibility of citizens to health care (TMS); changing based on the political criteria of the management personnel (SCP); the satisfaction level of the medical personnel (GSM); personal characteristics of the interviewed person (**VP**). The fourth equation is:

$$COR = f_4(RSS, CSE, TMS, SCP, GSM, \mathbf{VP}) + \varepsilon_4 \quad [7]$$

The variable ε_4 is uncorrelated with explanatory variables in the regression model, being homoscedastic. The f_3 function is defined as a linear combination of explanatory variables. In these circumstances, the regression model is defined as:

$$COR_i = d_0 + d_1 RSS_i + d_2 CSE_i + d_3 TMS_i + d_4 SCP + d_5 GSM + \mathbf{d}_6 \mathbf{VP} + \varepsilon_{4i} \quad [8]$$

$\mathbf{d}_6$ is a line vector with three parameters and **VP** is a column vector for the three variables used to evaluate certain personal characteristics.

5.3. Simultaneous equations model for the reform process

The general form

The simultaneous equations model is defined is the structural form as follows:

$$\mathbf{B}\mathbf{y}_i + \mathbf{C}\mathbf{x}_i = \boldsymbol{\varepsilon}_i \quad [9]$$

where residuum vector has a normal repartition $\boldsymbol{\varepsilon}_i \to N(\mathbf{0}, \boldsymbol{\Omega}), i = 1,...,G,$ and Ω matrix is defined as:

$$\Omega = \begin{bmatrix} \sigma_{11}\ \sigma_{12} \cdots \sigma_{1G} \\ \sigma_{21}\ \sigma_{22} \cdots \sigma_{2G} \\ \cdots\ \cdots\ \cdots\ \cdots \\ \sigma_{G1}\ \sigma_{G2} \cdots \sigma_{GG} \end{bmatrix}$$

The equations defined in our model rises a number of important issues from the public health system:

- quality of the reform of the system and its implications on the quality of medical services offered to citizens;
- the government policy in the health system and its implications on the development on medium and long term of the system;
- the level of the health education of the population in the prevention of illness and aggravation of a disease;
- the level of the nonacademic behavior in the public health system and its implications on the progress of the reform process and the quality of medical services offered to citizens.

For the estimates of the model parameters we used series of data form a statistical sample. The features of this sample are presented in the following.

Data sample

For data collection we used a two stage poll. The first stage was represented by public health units from Bucharest (hospitals, health centers, polyclinics) who were treated as primary sampling units. The second stage was represented by doctors in each primary sampling unit.

The representative sample from Bucharest consisted in 407 people, and the survey results are guaranteed with a 95% probability in circumstances where there is an error of representative ness of ± 2.5%.

The sample was divided in three categories of staff, as family doctors - 75, doctors in hospitals - 279 and doctors in polyclinics - 53.

The period of recording the information in the sample was about 2 weeks, these weeks being in June 2007. Thus the comparability of such responses from the individuals included in the sample was ensured, meaning that during this period were not taken any major decisions at the Ministry of Health to change the opinion of respondents, while most people were present at the workplace.

During the research we designed a questionnaire which was structured according to eight themes presented in Table 1. For each theme of the analysis the number of primary variables is specified in the table below. Based on the 52 questions in the questionnaire, of which 49 have been closed, were set 177 primary variables. Using primary characteristics a series of aggregated characteristics have been defined to be used in the simultaneous equations model.

Table 1

Primary and aggregated variables grouped on themes

No.	The theme	The number of primary variables	The number of aggregated variables
1.	General issues concerning the reform of the public health system	41	14
2.	Ministry policy in this area	18	5
3.	Health education of the population	18	4
4.	The analysis of the nonacademic behavior	24	7
5.	The research capacity of the public health system	24	2
6.	Characteristics of current activities	6	2
7.	Personal aspects	32	1
8.	General data	14	-
9.	Total	177	35

For questions definition of the questionnaire we took into account the following issues: the reform measures undertaken by the ministry on health reform, the European models used in the field of performance analysis for public health systems; application of the questionnaire developed in a first form at a pilot stage; the definition of the responses to closed questions on the basis of scale of measurement correctly specified. Table 2 gives the variables used in the model.

Table 2

Synthetic description of the aggregated variables used for the simultaneous equations model

No.	Code	Aggregated variable description	Primary variable number.
1.	*RSS*	The variable is defined to measure the medical staff opinion on the quality of reform in the public health viewed from the perspective of six components: system funding, procurement of medicines, the process of decentralization, the employment and promotion of staff with medium and higher medical studies and reform measures applied to the units in which they are employed. Range of values: 1 - very poor, 2, 3, 4, 5-very good.	6
2.	*CF*	Measures the quality of the factors that contribute to a good quality medical act in the public health units. Range of values: 1-very poor, 2, 3, 4, 5 - very good.	5

3.	*CSE*	Estimates the quality of the assessment system of health services provided to beneficiaries. Range of values: 1 - unsatisfactory, 2, 3, 4 - very good.	3
4.	*TMS*	It is an aggregate variable used to estimate the ministry transparency in decision-making in the reform process. Range of values: 1 - unsatisfactory, 2, 3, 4 - very good.	2
5.	*PDS*	Aggregated variable used to asses the quality of government policy in the field of public health from the perspective of the volume of public expenditure health, the quality of national health programs run by the ministry and the transparency of funds usage for compensated and free medicines in primary medicine. Range of values: 1 - unsatisfactory, 2, 3, 4 - very good.	3
6.	*ESP*	Aggregated variable used to measure the level of public health education to prevent illness and aggravation of a disease. Range of values: 1 - most people do not give importance to prevent the occurrence or aggravation of a disease, 2, 3, 4, 5 - most of the people give importance to this.	2
7.	*COR*	Aggregated variable used to measure the level of corruption at the national level in the opinion of medical staff with higher education. Range of values: 1 - there is no corruption, 2, 3, 4, 5 - there is generalized corruption.	5
8.	*PCS*	Quantifies to what extent patients who have followed a treatment requires a new specialized consulting. Range of values: 1 - a small part of them, 2, 3, 4, 5 - with few exceptions, all patients.	2
9.	*PAC*	Variable used for an overall assessment of the extent to which people give sufficient importance to their health. Range of values: 1 - do not give sufficient importance to their health, 2, 3, 4, 5 - give great importance to health.	2
10.	*ACS*	Quantifies what is the degree of accessibility of the citizen primary, secondary and tertiary health care. Range of values:1- reduced accessibility, 2, 3, 4, 5 – high degree of accessibility	3
11.	*DPE*	Aggregated variable used for an overall assessment of the contribution of public institutions to develop programs of health education and prevention of illnesses among the population. Range of values: 1 - unsatisfactory, 2, 3, 4 - very good.	4
12.	*UDP*	Primary variable used to assess the usefulness of health education programs and prevention among the population. Range of values: 1 - are not useful, 2, 3, 4, 5 - are very useful.	1
13.	*SCP*	Primary variable used to assess to what extent the political change of management personnel on political criteria. Range of values: 1 – changes in the leadership have not been made based on political changes, 2, 3, 4 - changing the technical staff on political criteria of is a practice.	1
14.	*GSM*	Aggregated variable defined to assess the satisfaction degree of the medical personnel. Range of values: 1 - are not happy at all, 2, 3, 4, 5 - fully satisfied	5

The models' equations and variables

Taking into account the manner of the definition of each variable and the series of data available we define the equations of the simultaneous equations model as:

1. Regression models' equations:

$$\begin{cases} RSS_i = c(1) + c(2)CF_i + c(3)CSE_i + c(4)TMS_i + c(5)PDS + c(6)ESP_i + \\ \quad c(7)GEN_i + c(8)ANI_i + c(9)PER_i + \varepsilon_{1i} \\ TMS_i = c(10) + c(11)PDS_i + c(12)RSS_i + c(13)COR_i + \\ \quad c(14)GEN_i + c(15)ANI_i + C(16)PER_i + \varepsilon_{2i} \\ ESP_i = c(17) + c(18)PCS_i + c(19)PAC_i + c(20)ACS_i + c(21)DPE + \\ \quad c(22)UDP + \varepsilon_{3i} \\ COR_i = c(23) + c(24)RSS_i + c(25)CSE_i + c(26)TMS_i + c(27)SCP + \\ \quad c(28)GSM + c(29)GEN_i + c(30)ANI_i + c(31)PER_i + \varepsilon_{4i} \end{cases} \quad [10]$$

In the above model, GEN is a variable for the gender of the person, ANI for the age of the person and PER for the category of staff. All other variables are presented in Table 2.

2. The four residual variables satisfy the assumptions made for the structural form of simultaneous equations model.

3. The variables of the simultaneous equations model are divided into endogenous and exogenous, according to Table 3.

Table 3

Endogenous and exogenous variables of the simultaneous equations model

Endogenous variables	Exogenous variables
RSS, TMS, ESP, COR	CF, CSE, PDS, GEN, ANI, PER, PCS, PAC, ACS, DPE, UDP, SCP, GSM, CSE

Hausman test

If the estimates of the models parameters is made using the two stage least squares method, the list of instrumental variables plays a unique role. In these circumstances the analysis of the exogenousness of the models' variables represents an important step. An important tool in this approach is the Hausman test (Hausman, 1978). The aim of this test is to verify the effectiveness and consistency of the estimators. In this sense there are defined the following two assumptions.

The first is the case when the list of instrumental variables is properly specified. The estimators for the parameter obtained by OLS, denoted by $\hat{\boldsymbol{\beta}}_0$, is efficient and consistent. In this case the explanatory variables in the regression model $\mathbf{y} = \mathbf{X}\boldsymbol{\beta} + \mathbf{u}$ are not correlated with residual variables, so that $H_0 : \text{cov}(\mathbf{u}, \mathbf{X}) = \mathbf{0}$.

In the second case, the list of instrumental variables is not properly specified. The estimator for the parameter $\boldsymbol{\beta}$ obtained by OLS, denoted by $\hat{\boldsymbol{\beta}}_1$, is effective and inconsistent. Residual variables are correlated with one or more explanatory variables, so that $H_1 : \text{cov}(\mathbf{u}, \mathbf{X}) \neq \mathbf{0}$.

The difference between the two estimators is $\hat{\mathbf{d}} = \hat{\boldsymbol{\beta}}_1 - \hat{\boldsymbol{\beta}}_0$ and the Hausman test statistics is:

$$H = \hat{\mathbf{d}}'(\text{var}(\hat{\boldsymbol{\beta}}_1) - \text{var}(\hat{\boldsymbol{\beta}}_0))^{-1}\hat{\mathbf{d}} \rightarrow \chi^2(r) \qquad [11]$$

where r is the number of the endogenous variables from the list of the explicative variables, thus of the variables $X_i, i = 1,...,r$ that satisfies $\text{cov}(u, X_i) \neq 0$.

If the statistics is greater than a predefined value, then null hypothesis is rejected, considering that in this case the second estimator gives more appropriate results.

5.4. Parameter estimates

We present the following parameters estimates for the above defined simultaneous equations model obtained by EVIEWS procedures. By applying Hausman test we compare the results for the simultaneous equations model for cases in which the parameters are estimated by the least squares method (OLS) and the two stages least square method (TSLS).

RSS equation

Any reform is a complex and lengthy process. At the system level there are a number of factors acting to carry out in good conditions, but there are a number of other factors that reduce the effectiveness of measures to reform the system. To analyze the characteristics of the reform process we propose a regression model without free term, with eight-explanatory variables. Parameters estimates are achieved through the least squares method (the results are presented in Table 4), in which case it is considered that all explanatory variables are exogenous, and the two stages least squares method, in which a series of explanatory variables are likely to be endogenous nature. To compare if the results are significant different between the two approaches we recourse to the Hausman test.

Table 4

Regression model [2] features

Dependant variable: *RSS*			
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the significance threshold
CF	0,309	0,035	8.784 (0,000)
CSE	0,017	0,042	0,406 (0,635)
TMS	0,041	0,040	1,010 (0,313)
PDS	0,393	0,058	6,746 (0,000)
ESP	0,141	0,035	4,024 (0,000)
GEN	- 0,027	0,050	0,539 (0,590)
ANI	0,047	0,023	2.074 (0,039)
PER	- 0,042	0,026	1.649 (0,100)

The results from the above table emphasize the existence of three categories of explanatory variables included in the model:

(1) First there are the variables that explain with certainty the quality of the process of reform in the public health system. Included here are: the quality of the factors that compete to achieve a good quality medical act - CF, the quality of government policy in the public health system - PDS, the quality of the assessment system of the health services – ESP, the age of person interviewed - ANI.

(2) The second category includes a number of variables that are likely to explain RSS. We include here the transparency of the decisions in the health system - TMS and the category of medical staff - PER.

(3) The third category is represented by variables that can not explain this structure of the RSS model. We include here the gender of the interviewed person - GEN and the quality of the evaluation system of health services provided to beneficiaries – CSE.

The results from the application of the two methods to the situation in which the RSS is explained in terms of explanatory variables CF, PDS, ESP, ANI and TMS are presented in Table 5.

Table 5

RSS* regression model on the following variables: *CF, PDS, ESP, TMS* and *ANI

Dependant variable: *RSS*			
Source model characteristics Regressors Residuum Total	Square sum 1897,9 117,7 2015,6	Degrees of freedom 5 402 407	Observations number 407 F 1296,9 Prob>F 0,000
Explanatory variables	Coefficient	Standard deviation	T-student statistics and level of significance
CF	0,336	0,029	11,490 (0,000)
PDS	0,407	0,058	7,051 (0,000)
ESP	0,170	0,033	5,208 (0,000)
ANI	0,055	0,022	2,470 (0,014)
TMS	0,045	0,040	1,112 (0,260)

After applying the method of the two stages least squares to estimate the parameters of regression model we obtained the results below.

Table 6

RSS* regression model on the following variables: *CF, PDS, ESP, TMS* and *ANI

Dependant variable: *RSS*			
Source model characteristics Regressors Residuum Total	Square sum 1871,4 134,3 2005,7	Degrees of freedom 5 402 407	Observations number 407 F 11120,5 Prob>F 0,000
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
CF	0,463	0,136	3,408 (0,001)
PDS	0,549	0,299	1,836 (0,067)
ESP	0,178	0,070	2,536 (0,012)
ANI	-0,094	0,128	-0,736 (0,462)
TMS	-0,058	0,102	-0,572 (0,568)
Instrumental variables list	CF, CSE, PDS, ANI, PER, PCS, PAC, ACS, DPE, UDP, SCP, GSM, CSE, COR, FLC, RCO, GSM, FMM		

To determine if there are significant differences between the two results we applied the Hausman statistics test based on equation [11]. Hausman statistics test value equal to 25.8 shows that there are significant differences between the two categories of estimates. In these circumstances, the results presented in Table 6 are validated.

TMS equation

Ensuring transparency in carrying out decisions during the reform process in any field of activity is an important factor for its success. To analyze the transparency of the health system we take

into consideration factors related to characteristics of the reform process, the quality of government policy on health, the level of corruption and nonacademic behavior inside the system, and personal characteristics such as age, staff category, etc. We present in the table below the results from the OLS estimates of the parameters model used for analyzing TMS variable:

Table 7

Regression model [4] characteristics

Dependant variable: *TMS*			
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the significance threshold
PDS	0,758	0,067	11,359 (0,000)
RSS	0,131	0,053	2,468 (0,014)
COR	0,045	0,032	1,412 (0,159)
GEN	0,043	0,066	0,645 (0,520)
ANI	0,018	0,028	0,623 (0,533)
PER	0,013	0,033	0,396 (0,692)

These results show three categories of factors:

(1) First there are the variables which certainly explain the transparency of decisions in the public health. We include here the quality of government policy in health system - *PDS* and the quality of reform in the public health - *RSS*.

(2) The second category includes a variable *COR* - corruption in the system, which is likely to be included in the model with a large extent.

(3) In the third category we include a number of variables which does not explain the transparency of decisions on the system. In this category there are personal characteristics of the medical staff included in the sample: the gender of the interviewed person - *GEN*, the age of the person - *ANI* and the category of the staff - *PER*.

The second regression model is defined solely on the basis of the explanatory variables of the first and second categories of variables defined above. In the table below we show the

characteristics of this model for the case when the parameters estimates are achieved through the least squares.

Table 8

TMS* regression model depending on *PDS, RSS* and *COR

Dependant variable: *TMS*			
Source model characteristics Regressors Residuum Total	Squares sum 1131,4 270,2 1401,6	Degrees of freedom 3 404 407	Observations number 407 F 563.86 Prob>F 0,000
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
PDS	0,764	0,066	11,562 (0,002)
RSS	0,160	0,047	3,395 (0,001)
COR	0,068	0,024	2,896 (0,004)

After applying the two stage least squares method to estimate the parameters of regression model to obtain the results below.

Table 9

TMS* regression model depending on *PDS, RSS* and *COR

Dependant variable: *TMS*			
Source model characteristics Regressors Residuum Total	Squares sum 1131,4 270,2 1401,6	Degrees of freedom 3 404 407	Observations number 407 F 563.86 Prob>F 0,000
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
PDS	1,672	0,537	3,111 (0,0020)
RSS	-0,372	0,383	-0,971 (0,332)
COR	0,024	0,072	0,332 (0,740)
Instrumental variables			

Using the Hausman test, whose statistics is calculated on the basis of the relationship [11], we determined if between the two estimates are significant differences. We mention that the results presented in the last two tables show a number of significant differences. If in the first case all the three variables are significant in defining the model, in the second case we found out that the parameters that correspond to the variables *RSS* and *COR* are not significantly different from zero. Hausman statistics value equal to 5.28, indicates that between the two categories of estimates there are significant differences. These results confirm the endogenous character of the variables *RSS* and *COR*.

ESP Equation

An important aspect of increasing the efficiency of using financial, material and human resources in the public health system is to improve the health education of the population. Therefore, in the reform process of the public health system an important issue should be the development of programs that increase health education of the population and illnesses prevention among the population. To analyze the variable used to measure the level of health education of the population we made use of a regression model with a series of explanatory variables that refer to attention given by population to the health (*PAC*), the practice of patients to ask for a new medical investigation at the end a period of treatment (*PCS*), the extent to which different institutions or organizations are involved in developing programs for health education among the population (*DPE*), the accessibility of public healthcare services (*ACS*) and the usefulness of these types of programs (*UDP*).

The table below shows the results from the application of the least squares method to estimate the models' parameters defined above for the analysis of the variable used to measure the level of health education of the population (*ESP*).

Table 10

ESP regression model characteristics

Dependant variable: *ESP*			
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
PCS	0,084	0,038	2,200 (0,028)
PAC	0,520	0,046	11,188 (0,000)
ACS	0,040	0,035	1,123 (0,262)
DPE	0,204	0,045	4,513 (0,000)
UDP	0,009	0,025	0,373 (0,709)

Results from the table 10 show three categories of explanatory variables included in the model:

(1) First there are the variables that certainly explain the level of health education of the population. Variables included here are CAP, DPE and PCS.

(2) The second category includes a variable that is likely to be included in the model - ACS.

(3) The third category includes the UDP variable that does not explain the health education of the population.

The results obtained by the application of the two methods to the situation in which the ESP is explained in terms of explanatory variables CF, PDS, FSP, ANI and TMS are presented in Table 11.

Table 11

ESP* regression model depending on *PCS, PAC, ACS* and *DPE

Dependant variable: *ESP*			
Source model characteristics Regressors Residuum Total	Squares sum 1834,2 167,0 2001,2	Degrees of freedom 4 4032 407	Observations number 407 F 1106,3 Prob>F 0,000
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
PCS	0,086	0,038	2,288 (0,023)
PAC	0,523	0,046	11,437 (0,000)
ACS	0,046	0,031	15,467 (0,110)
DPE	0,207	0,044	4,718 (0,000)

After applying the two stages least squares method to estimate the parameters of regression model we obtained the results presented in Table 12.

Table 12

ESP* regression model depending on *PCS, PAC, ACS* and *DPE

Dependant variable: *ESP*			
Source model characteristics Regressors Residuum Total	Squares sum 1871,4 134,3 2005,7	Degrees of freedom 5 402 407	Observations number 407 F 11120,5 Prob>F 0,000
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
PCS	-0,079	0,123	-0,648 (0,517)
PAC	1,025	0,460	2,228 (0,026)
ACS	-0,132	0,237	-0,557 (0,578)
DPE	0,021	0,137	0,151 (0,880)
Instrumental variables	CF, CSE, PDS, ANI, PER, UDP		

Table 12 shows inconclusive results for this model if the parameters were estimated by the two stages least square.

COR Equation

The quality of the reform in the public health system directly affects the nonacademic behavior and the corruption in the system. The existence of mechanisms that generate corruption in the system is a brake on the progress of the reform process. The regression model without the free term presented here evidence a number of factors which directly influence corruption in the system. To define the model we envisaged results from the descriptive analysis of the data series on corruption and intensity factors acting to reduce it. We took into account a number of factors, such as: the defective or incorrectly applied legal framework, the wages of medical personnel that encourage the nonacademic behavior, the pressure from the political and economic environment, the behavior of the patients, etc.

Table 13 shows the results from the application of the least squares method for the estimates of the parameters of the model used to analyze the COR variable which is defined by [8].

Table 13

Regression model [8] characteristics

Dependant variable: *COR*			
Source model characteristics Regressors Residuum Total	Squares sum 43917,20 386,96 4778,16	Degrees of freedom 8 399 407	Observations number 407 F 566,0 Prob>F 0,000
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
RSS	-0,028	0,079	-0,354 (0,725)
CSE	0,029	0,071	0,415 (0,679)
TMS	0,125	0,064	1,939 (0,053)
SCP	0,186	0,061	3,043 (0,002)
GSM	0,758	0,091	8,357 (0,000)
GEN	0,061	0,043	1,418 (0,157)
ANI	0,155	0,049	3,195 (0,002)
PER	0,320	0,040	8,021 (0,000)

The results from table 13 show three categories of explanatory variables included in the model:

(1) First are the variables TMS, SCP, GSM, ANI and PER whose parameters significantly differ from zero in the regression model defined above.

(2) The second category includes the variable GEN which is likely to be included in the model.

(3) The third category includes variables RSS and CSE whose parameters do not significantly differ from zero in the current regression model.

The results from the application of the two methods to the situation in which the RSS is explained in terms of explanatory variables TMS, SCP, GSM, GEN, ANI, PER are presented in Tables 14 and 15.

Table 14

Regression model *COR* depending on *TMS, SCP, GSM, GEN, ANI, PER*

Dependant variable: *COR*			
Source model characteristics	Squares sum	Degrees of freedom	Observations number 407
Regressors	4390,9	6	F 747,9
Residuum	387,2	401	Prob>F 0,000
Total	4778,1	407	
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
TMS	0,123	0,060	2,040 (0,042)
SCP	0,320	0,040	8,043 (0,000)
GSM	0,187	0,053	3,556 (0,000)
GEN	0,761	0,088	8,615 (0,014)
ANI	0,060	0,042	1,413 (0,150)
PER	0,154	0,048	3,188 (0,002)

After applying the two stages least squares method to estimate the parameters of regression model we obtained the results presented in Table 15.

Table 15

Regression model *COR* depending on *TMS, SCP, GSM, GEN, ANI, PER*

Dependant variable: *COR*			
Source model characteristics	Squares sum	Degrees of freedom	Observations number 407
Regressors	4365,8	6	F 243,0
Residuum	1200,7	401	Prob>F 0,000
Total	5566,5	407	
Explanatory variables	Coefficient	Standard deviation	T-student statistics and the level of significance
TMS	0,369	0,253	1,459 (0,001)
SCP	0,612	0,235	2,607 (0,009)
GSM	0,384	0,313	1,226 (0,221)
GEN	1,802	1,037	1,738 (0,083)
ANI	-1,085	0,477	-2,272 (0,024)
PER	0,062	0,469	-0,132 (0,895)
Instrumental variables list	RSS, CF, CSE, PDS, ESP, PCS, DPE, FMM, ACS		

To determine if the two results are significant different, we calculated the Hausman statistics test on the basis of the relation [11]. Hausman statistics value equal to 9.86 indicates that between the two categories of estimates there are significant differences.

5.5. Conclusions

Starting from a set of assumptions, we define the equations of the simultaneous equations model used to analyze some important issues related to the progress of the reform process in the public health system.

The equations defined in our model rise a number of important issues from the public health system:

- quality of the reform of the system and its implications on the quality of medical services offered to citizens;
- the government policy in the health system and its implications on the development on medium and long term of the system;
- the level of the health education of the population in the prevention of illness and aggravation of a disease;
- the level of the nonacademic behavior in the public health system and its implications on the progress of the reform process and the quality of medical services offered to citizens.

By applying Hausman test we compare the results for the simultaneous equations model for cases in which the parameters are estimated by the least squares method (OLS) and the two stages least square method (TSLS).

For the first equation, that describes the quality of the reform process, the Hausman statistics test value equal to 25.8 shows that there are significant differences between the two categories of estimates. In these circumstances, the results presented in Table 6 are validated.

For the second equation, the one that describes the transparency of the decisions in the reform process, after we estimated the parameters using OLS and TSLS we computed the Hausman statistics test value which is equal to 5.28. The results

indicate that between the two categories of estimates there are significant differences. These results confirm the endogenous character of the variables *RSS* and *COR*.

To analyze the variable used to measure the level of health education of the population we made use of a regression model with a series of explanatory variables that refer to attention given by population to the health (*PAC*), the practice of patients to ask for a new medical investigation at the end a period of treatment (*PCS*), the extent to which different institutions or organizations are involved in developing programs for health education among the population (*DPE*), the accessibility of public healthcare services (*ACS*) and the usefulness of these types of programs (*UDP*). The results obtained in this case shows inconclusive results for this model if the parameters were estimated by the two stages least square.

To define the equation describing corruption and nonacademic behavior influence we envisaged results from a descriptive analysis of data series on corruption and intensity factors acting to reduce it. In this case too, we estimated the parameters by OLS and TSLS methods and Hausman test statistics calculated on the basis relation [11]. Hausman statistics value equal to 9.86, indicates that between the two categories of estimates there are significant differences.

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Chapter 6

A Model of Social and Economic Analysis of Corruption

6.1. Introduction

The study starts, on one hand, from the statement unanimously accepted, that corruption exists in all societies, and on the other hand, from the preoccupations existent in the international literature about proving scientifically the models of analysis of corruption and determining on this basis some relevant corruption indicators.

In essence, the study focuses on the sphere of the theoretical preoccupations, trying to offer an interpretation based on extended social and economic analysis that structures and describes the mechanisms of a genuine system of the corruption actions. Most frequently, corruption occurs in the common public-private activities and it has determinations in the central or local governmental structures. The binom corruption - anticorruption has its origin in distinct social actions, with different actors and different logic constructions, aiming to destroy or strengthen the systems of public integrity.

In the context of the theoretical approaches, this study presents for exemplification relevant aspects concerning social perception on corruption and comparisons of the situations in Romania with those in Central and Eastern Europe or the states newly acceded in the European Union.

The study aims a new way for approaching the nonlinear relationship between political stability/instability and corruption. An extended space is granted to the model of corruption market, conditions of balance within its framework, as well as the intrinsic link with the political stability/instability.

As it is conceived, the study enables the enlargement of the theoretical and empirical researches concerning the corruption phenomena.

6.2. Premises of the model

Our approach starts from the necessity to enlarge and diversify the instruments and methods for corruption analysis. The specialized literature and the reports of various organizations with preoccupations in the fight against corruption reveal the systemic feature of the corruption activities. Herewith, we refer to an open system, with profound social, economic and political connections. The dynamics of the system under discussion has got specific determinations and developments for each country, embracing sophisticated forms that, sometimes reach to have the dimension of a governmental policy.

The social reality has identified a series of methods for the fight against corruption, transposed in good practices, whose application depends essentially of the public integrity systems from each country.

"While there is no blueprint for an effective system to prevent corruption and for the fight against corruption, there is a growing international consensus as to salient features of anticorruption systems that work with best results. " [1]

[1] "National Integrity System. Romania 2005", (Country Study), www.transparency.org.ro, p. 2.

6.2.1. Social and political determinations

The studies on social perception concerning corruption have extended in the latest years, getting more professionalism and broader scope.

The areas and institutions most affected by corruption remain the political parties (4.0), parliaments (3.7), police (3.6), and judiciary (3.5). [2]

The overwhelming majority (45) from the 69 countries surveyed, confirmed this reality. The points inscribed near each area are on a scale from 1 to 5.5, meaning that for the respective areas the qualificative "extremely corrupt" is significant.

The Global Corruption Barometer (GCB)[3], initiated in 2002 by Transparency International reflects the fact that "the country to which belongs the respondent is more relevant for the answers given concerning the corruption level"[4].

From this perspective, our study will focus on the situation in Romania, trying to state adequate judgments, based on the consideration that a series of conclusions are relevant also for another country.

In Romania, the perception is that the most corrupt sectors are those of political parties and customs system, followed by judiciary, legislature, police and medical system (Appendix 1).

The eventual progress in the anticorruption activities is not yet reflected in the public opinion.

For Romania, the conclusions concerning the perspectives of the next three years are as follows:[5]

✓ 37% of the population believes that corruption has increased and only 19% that it has decreased, and 34% have perceived no difference;

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[2] Transparency International, "Global Corruption Barometer 2005", p. 6.
[3] www.transparency.org/policy_reaserch/surveys_indices
[4] Transparency International, "Report on the Transparency International Global Corruption Barometer 2005", p. 2, www.transparency.org/policy_research/surveys_indices/gcb
[5] Idem, p. 4.

✓ At least one third from the respondents expresses the opinion that the situation will improve. However, 36% do not believe that the corruption level will change during the next three years;

✓ It is maintained the perception that the bribery prevails and at least 11% of the respondents answered that they had to offer bribe during the last year. The estimated level of the bribe for the members of a family in the last 12 months is of 56 USD, equivalent to 154 USD related to the purchasing power of 2003.[6]

6.2.2. The National Integrity Systems: Corruption profile

In Transparency International (TI) conception, the National Integrity Systems (NIS) comprise "key institutions, laws and practices (the 'pillars") that contribute to integrity, transparency and accountability in a society. " [7]

The perspectives of the analysis and modeling the corruption phenomena, aimed by our study, are supported by the country studies that provide both an overview on NIS, the indicators for measuring the subsequent progresses from those countries, as well as a basis of comparisons among states.

The above mentioned country study asserts: "when it functions correctly, NIS fights against corruption as part of a broader fight against the abuse of power, breaking the law and fraud under all its forms".

Referring to Romania, the country study in 2005 reconfirms a profile, somehow improved related to the previous years, but it remains the perception of "endemic and systemic corruption at almost all institutional levels".[8]

According to TI evaluations, Romania recorded in 1997 a corruption index of 3.47, in the following years registered a

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[6] Indicators of Online Development of the World Bank, http://publications. worldbank.org/WDI/.

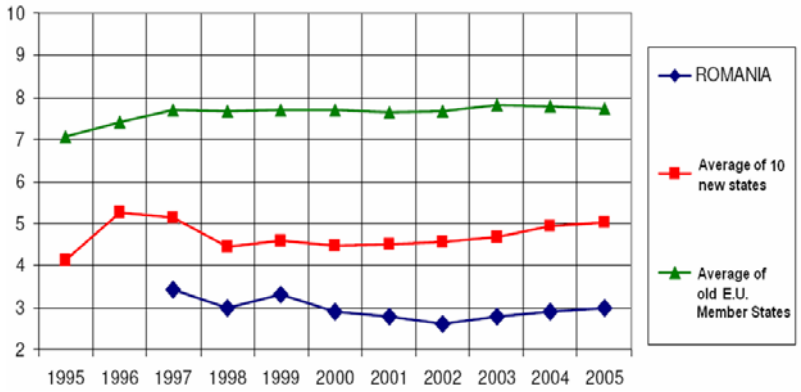
[7] "National Integrity System. Country Study. Romania 2005, Transparency International Romania, p 1.

[8] Idem, p. 5.

negative trend, reaching in 2002 the lowest score of 2.6; afterwards it started to increase, reaching in 2005 the score of 3.

Appendix 2 presents the developments of the TI and GRICS (Governance Research Indicator Country Snapshot)[9] indices.

Figure 1 presents a more suggestive image about the development of TI corruption perception index during 1997-2005.



Source: ww.transparency.org/policy_research/surveys_indices/gcb

Fig. 1. *The development of corruption perception index during 1997-2005*

At the same time, other sources indicate the fact that the corruption phenomena persist and amplify a lot above the average of other European countries.

Further the negotiations of accession into the European Union, the Government of Romania required in 2000 from the World Bank a diagnostic of corruption. The study identified the sectors perceived to be the most corrupt: customs, courts and prosecutor offices, privitising institutions, ministries etc.

[9] http: //info.worldbank.org/governance/khz 2004/indicator_report.asp

In 2002, a survey achieved by Gallup shows the fact that the Romanians perceive corruption as the most important problem and a social illegitimate act.

The perspective of Romania integration into the European Union has determined major reforms in the judiciary aimed to make secure its independence. In 2005, the Government of Romania adopted a new strategy, a new anticorruption plan, with the declared aim to fight against great corruption.

In the context of the Central and Eastern European countries, the comparative situation regarding the corruption perceptions index is presented in Figure 2.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
ROMANIA	-	-	3.44	3.00	3.30	2.90	2.80	2.60	2.80	2.90	3.00
Bulgaria	-	-	-	2.90	3.30	3.50	3.90	4.00	3.90	4.10	4.00
Turkey	4.10	3.54	3.21	3.40	3.60	3.80	3.60	3.20	3.10	3.20	3.50
Poland	-	5.57	5.08	4.60	4.20	4.20	4.10	4.00	3.60	3.50	3.40
Czech Republic	-	5.37	5.20	4.80	4.60	4.30	3.90	3.70	3.90	4.20	4.30
Slovak Republic	-	-	-	3.90	3.70	3.50	3.70	3.70	3.70	4.00	4.30
Hungary	4.12	4.86	5.18	5.00	5.20	5.20	5.30	4.90	4.80	4.80	5.00
Slovenia	-	-	-	-	6.00	5.50	5.20	6.00	5.90	6.00	6.10
Cyprus	-	-	-	-	-	-	-	-	6.10	5.40	5.70
Greece	4.04	5.01	5.35	4.90	4.90	4.90	4.20	4.20	4.30	4.30	4.30

Fig. 2. *Comparative evolution of the corruption perception index between 1995 – 2005 for countries of the Central and Eastern Europe*
(Source: http://www.transparency.org.ro/)

From the view point of Romania's accession to the European Union, a significant comparison is presented in Figure 3 – a clear reference to the average of old E.U. members, that of the new members and of course, of Romania.

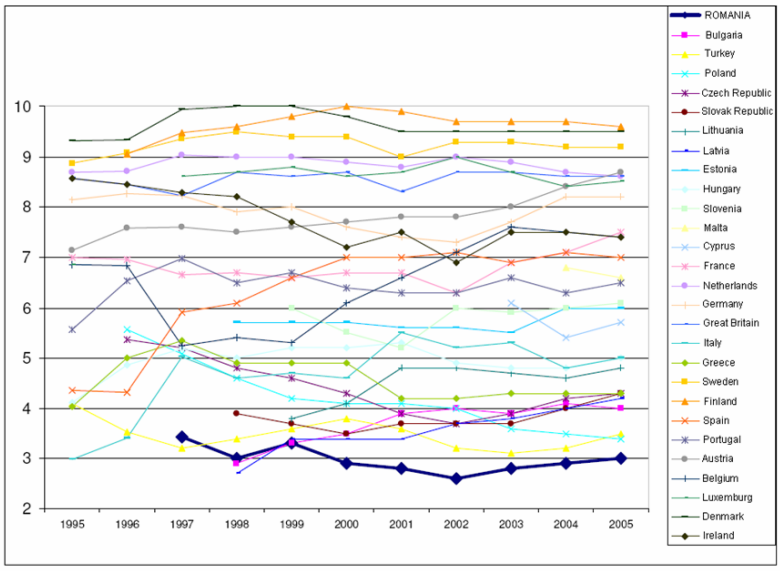


Fig. 3. *Comparative situation Romania – European Union of Corruption Perception Index*
(Source: http://www.transparency.org.ro/)

6.3. The political stability and corruption

Recent studies have put into discussion and modeled the relation between the political stability / instability and corruption. The most relevant and usually quoted paper is the one that belongs to Campante, F., Chor, D., Do, Q.A. (2005). Using relevant and recent information from different countries, the mentioned authors manage to show the existence of a non-monotonous relation between the political stability/instability and corruption.

The most comprehensive definition for political stability sees the concept in question as "a probability that all in power are able to implement their projects on time"[10].

[10] Campante, R. F., Chor, D., Do, Quoc-Anh, 2005, *Instability and the Incentives for Corruption*, Harvard University, p. 2.

The proposed model emphasizes two effects:

▪ *the time horizon effect*, which stipulates that, during their mandate, greater instability generates higher corruption among the holders of power;

▪ *the demand effect,* through which the private sector is more eager to bribe the politicians who are politically more stable.

The first effect is predominant for low values of stability, while the second prevails in the most stable political regimes. The conclusion of the theoretical and practical investigation already employed by the mentioned authors, states: corruption is higher at low and high levels of stability, and lower, at intermediary levels. The above study uses the aggregated corruption perception index presented by Kaufmann, Kraay and Mastruzzi (2004).

The study of the numeric values and their interpretations lead to the idea that there is a variation of corruption in form of a **U**. For the countries of the Central and Eastern Europe, and especially for Romania, the time frame included between 1990 and 2005 has emphasized other elements to be taken into account when discussing about the political stability/instability.

In a Romanian perspective, the leading characteristics consist of:

• The persistence of a political instability as an effect of the fluidity of the political life and lack of maturity of the political options;

• The existence of electoral cycles for both central and local administrations;

• The alternation in governance of power holders and opposition, usually structured from different coalitions, factions or parties.

In this context, the present study proposes a simplified model of the evaluation of stability/instability, by means of a stability index (**IS**), calculated for each electoral cycle. The elements aggregated in this index are:

• The probability for the same government to hold the power within an electoral cycle. In fact, this probability will be calculated indirectly, with the help of a random variable (**AS**);

• The forces ratio between power holders and opposition (**RF**), expressed by a sub-unitary coefficient that stands for the number of parliamentary mandates of the opposition / the number of parliamentary mandates of the power;

• The structure of the power, expressed by the number of political entities which participate to governance (**SP**).

In the attempt to modeling the statements already made for the Romanian case, three electoral cycles are to be taken into consideration: (1): 1992 – 1996; (2): 1997 – 2000; (3): 2001 – 2004. The probability to hold the power in these three periods will be found in a random variable shaped as follows:

$$AS_i : \begin{pmatrix} 1 & 2 & \dots & n \\ p_1 & p_2 & \dots & p_n \end{pmatrix}; n = \quad \textit{number of major changes of government} \qquad (1)$$

$$p_1 < p_2 < \dots < p_n$$

and the stability index will be given by the expression:

$$IS_i = \frac{2}{n(n+1)} \cdot \frac{RF_i}{SP_i} M\left(AS_i\right) \qquad (2)$$

where M (AS) is the average of random variable AS.

In Romania's case[11] we will have:

$$AS_1 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}; \qquad AS_2 = \begin{pmatrix} 1 & 2 & 3 \\ \frac{1}{8} & \frac{2}{8} & \frac{5}{8} \end{pmatrix} \qquad (3)$$

[11] National Institute of Statistics, Permanent Electoral Authority, Jan. 2005, "Electoral statistics. Parliamentary and presidential elections", Bucharest, pp. 24-48.

$$AS_3 = \begin{pmatrix} 1 & 2 \\ \frac{1}{4} & \frac{3}{4} \end{pmatrix}$$

$$RF_1 = \frac{221}{250} = 0.88\ ,\ RF_2 = \frac{184}{287} = 0.64\ ,\ RF_3 = \frac{211}{259} = 0.81 \quad \textit{and} \quad \textit{(4)}$$

$$SP_1 = 3, \quad SP_2 = 3, \quad SP_3 = 1 \qquad \textit{(5)}$$

Thus we obtain,

$$IS_1 = 0.29; \quad IS_2 = 0.08; \quad IS_3 = 0.47 \qquad \textit{(6)}$$

By correlating the above findings with the data presented in Appendix 2, if we consider a medium corruption index, for each electoral cycle, we will have relevant images as shown in Figure 4 and Figure 5.

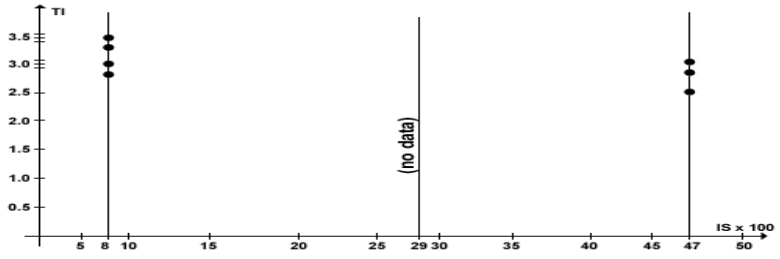


Fig. 4. *The relation between the political stability and corruption (using TI index)*

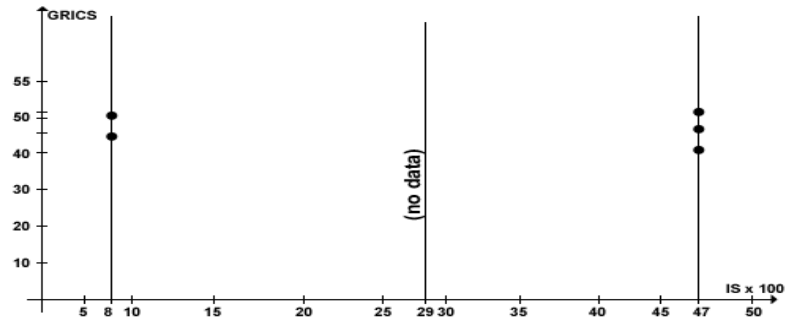


Fig. 5. *The relation between the political stability and corruption (using GRICS index)*

It was impossible to draw a more pertinent image and closer to the reality, due to the lack of some empirical statistical data. In our opinion, this new approach to the relation between political stability and corruption confirms the results mentioned at the beginning of this section. Using them as a starting point, the statistical experimental studies may offer also a possible prognosis to the corruption level. A more detailed discussion and analysis can be accomplished if we will concentrate upon a certain type of corruption.

6.4. The corruption market

6.4.1. Introduction

Regarding the relation between the political stability and corruption, other papers also confirm the non-linear character of this relation and the fact that "at low or high levels of performance of a ruling party or politician, the corruption is more intense, while at intermediate levels, is weaker"[12].

[12] Gamboa – Cavazos, M., Garza-Cantu, V., Salinas, E. (2006), "The Organization of Corruption: Political Horizons and Industrial Interests", Harvard University, pp. 1-3.

Moreover, the above study discovers that the firms that accumulate more incomes from their industries are those willing to offer more bribery, fact also directly related to the political stability. The relation between the corrupted and the corruptor is bivalent in the sense that each of the two actors may be an active actor. As such, the reality confirms that for instance, in the case of the firms in economic decline, the public persons pretend higher payments for corruption. In a mutual way, the entrepreneurs have the impulse to bribe the civil servants with stable and long term political horizons. For them, the supply for corruption is increasing both as number and effective value.

Most of the times, in the relation established between the corrupted and the corruptor, negotiation and intermediation usually occur under the form of traffic of influence where public or private persons are involved.

As such, we can talk of a corruption market which may appear at the interface between the public and private. The dimensions of this market differ from one country to other and depend on different factors, amongst which we found the ones described in the previous sections.

The corruption market bases itself on several principles to which one can add or further detail:

- The existence of a demand and supply of corruption. Usually, goods that are offered or requested are public goods, public services, or different forms for facilitating access to the ownership of public goods or services (usually described by obtaining licenses, approvals, etc.). Even though they do not explicitly imply the existence of a market for corruption, Shleifer and Vishny (1993) analyze corruption in the context offered by the demand and supply of public goods. They suggest that there is a competition between a seller and a buyer which favorites the extension of corruption.
- The mechanisms that regulate the functioning of the corruption market are not legal or visible and generally, refer to law imperfections, lack of control from courts and of course,

favorable attitude to corrupt or being corrupted adopted by public or private persons;

- In relation to the intensity of the ratio between the demand and supply of corruption, there is a price of corruption expressed, usually, by bribery. The appearance of such a price differs from the one to be found in economic theory and it grounds itself upon factors related to economic circumstances, opportunity of public interventions, etc., as well as power and political and administrative position of the one corrupted.

The above principles have been taken into account, even though, not explicitly, by other authors, as well. We refer here to Campante (2005) or Gamboa – Cavazos (2006).

As in any other market, the actors try to maximize their profits. As such, for the offer of corruption where the actor is a public person, politician, governmental official, etc., the evaluation trend will increase, while for the demand, having as an actor a private person, an entrepreneur, owner of private employee, the evaluation trend of the opportunity of corruption will decrease.

6.4.2. The balance of the corruption market

Starting from a simple analysis of the demand and supply on the corruption market, Gamboa – Cavazos (2006) assume linear relations between the two, using the price ***c.*** So, the mentioned authors consider[13]:

- For the supply:

$$S(c) = \gamma + \delta c \qquad (7)$$

- For the demand:

$$D(c) = \alpha - \beta c \qquad (8)$$

where c is the price of corruption and $\gamma\ \delta, \alpha, \beta \rangle 0$ are parameters.

[13] Idem, p. 9.

The interaction between the demand and supply determines the level of balance of corruption and their price (***c****), that is:

$$c^* = \frac{\alpha - \gamma}{\beta + \delta} \qquad (9)$$

and

$$S(c^*) = \gamma + \delta\left[(\alpha - \gamma)/(\beta + \delta)\right] \qquad (10)$$

$$D(c^*) = \alpha - \beta\left[(\alpha - \gamma)/(\beta + \delta)\right] \qquad (11)$$

Of course, the model formulated by Gamboa – Cavazos is simple. However, it allows a certain connection with the political stability. Firstly, an observation should be made: from (10) and (11), the parameters α and γ intervene and they are connected to the structure of the governmental agencies [Schleifer and Vishny (1993), Fredriksson and Svensson (2003), Campante (2005)], while the second set, β and δ_i is connected just to the structure of the market where the firms operate [Ades and Di Tella (1999), Laffont and N'Guessan (1999)]. Bearing these definitions in mind, we continue with an extension of the model of corruption market and determination of more complex balance conditions.

First, we suggest accepting the idea according to which the corruption market behaves as a system with self-regulation. The analyses made in the previous sections claim this very thing. At the same time, the same system represented by the corruption market or, better said, the corruption economy records a very high pressure coming from the environment; a pressure that varies as degree in direct connection to the intensity of the anticorruption measures.

The economics of corruption represents, in the broad sense, a "relation state - society" and it conceives and describes the "deviations" from the ideal state that occur as effects of corruption.[14]

[14] Karasulu, A. (2003), "The Economics of Corruption: Causes, Consequences and Extent", Journal of Historical Studies, No. 1 (2003), p. 61.

As such, we will presume the existence of more opportunities for corruption, **n**, for each being settled a price, respectively, $c_{1,}\ c_{2,\ \ldots}\ ,\ c_n$.

The line of supply as the line of demand will have vectorial expressions, as follows:

$$S(c) = \gamma + \delta \bullet c \qquad (12)$$

$$D(c) = \alpha - \beta \bullet c \qquad (13)$$

where

$$\gamma = (\gamma_1 > \gamma_2 \ldots \gamma_m)^t\ ,\quad \alpha = (\alpha_1, \alpha_2, \ldots\ldots, \alpha_m)^t\ ,$$

$$\delta = (\delta_{ij})_{\substack{1 \le i \le m, \\ 1 \le j \le n}}\ ,\ \beta = (\beta_{ij})_{\substack{1 \le i \le m, \\ 1 \le j \le n}}\ ,\ \delta_{ij} \ge 0, \beta_{ij} \ge 0 \quad \textit{and}$$

$$c = (c_1, c_2, \ldots . c_n)^t$$

Following the procedure used in determining the balance expression (9), we will find a balance condition, of a matrix shape:

$$(\beta + \delta) \bullet c^* = \alpha - \gamma \qquad (14)$$

A qualitative analysis of the relation (14) and its interpretation in the light presented in this study lead us to the following conclusions:

1) $\alpha = \gamma,\ m = n,\ \det(\beta + \delta) \neq 0$, the balance price of corrupttion is zero and, practically, the corruption market does not exist.

2) $\alpha \rangle \gamma, m = n,\ \det(\beta + \delta) \neq 0$, there is a system of prices of balance for the opportunities for corruption, given by the expression:

$$c^* = (\beta + \delta)^{-1}\ (\alpha - \gamma) \qquad (15)$$

The supply of corruption will be:

$$S(c^*) = \gamma + \ \delta \bullet (\beta + \delta)^{-1}\ (\alpha - \gamma) \qquad (16)$$

and the demand of corruption becomes:

$$D(c^*) = \alpha - \beta \bullet (\beta + \delta)^{-1}\ (\alpha - \gamma) \qquad (17)$$

Similar to the interpretations presented in the paper by Gamboa – Cavazos (2006), the structure of the market where public agents operate will be determined by vectorial parameters: α and γ, while the structure of the market where the firms operate will be connected to the matrix shaped parameters β and δ.

3) $\alpha \rangle \gamma$, $m \langle n$, $rank(\beta + \delta) = m$

In these conditions, the balance price is not unique and, in certain conditions it may raise the problem of determining an optimum for the corruption market.

4) $\alpha \rangle \gamma$, $m \rangle n$, $rank(\beta + \delta) = n$ may appear in non-balance situations, when there is not a balance price or a unique one. The variety of situations that may be taken into account may substantiate other types of relations possible to influence the corruption market balance.

6.5. Conclusions

The social and economic analysis of corruption presents a multitude of aspects and approaches, each one closer or not to reality, more theoretic or empiric etc.

As a final conclusion, we may state that undoubtedly a corruption market exists, with its own mechanisms, and whose legitimacy is not integrally discovered. The methods of social and economic analysis can be extended, with the adequate precautions also on this market. In fact, the specialized literature raises into discussion and achieves the concepts of corruption as well as its connections with the material and human development.

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10. Transparency International Romania, *„National Report on Corruption, April 2006",* National Integrity System, Romania 2005, (country study), www. transparency.org.ro.

Appendix 1

Romania: Areas/sectors perceived to be corrupt

Country \ Area		Political parties	Legislature	Police	Judiciary	Tax Revenue	Business Environment	Customs	Medical system	Media	Educational system	Utilities	Registry / Permit services	Military	NGOs	Religious bodies
Romania	2004	4.2	4.0	3.8	4.1	2.9	3.7	4.2	3.9	2.5	3.3	2.5	3.4	2.4	2.7	2.2
	2005	3.8	3.6	3.6	3.7	2.4	3.4	3.8	3.6	2.7	2.9	2.5	2.9	2.4	2.5	2.1
Central& Eastern Europe	max	4.5	4.2	4.2	4.3	3.8	3.8	4.5	4.1	3.7	3.8	3.1	3.6	3.5	3.4	2.7
	min	3.1	2.5	1.9	3.0	2.4	3.0	2.7	2.9	2.2	2.4	2.2	2.4	1.2	2.2	1.6
	ave-rage	4.0	3.9	4.0	3.9	3.5	3.7	3.7	3.7	3.2	3.5	2.9	3.4	3.1	2.7	2.3
Western Europe	max	4.2	3.6	3.3	3.3	3.7	3.5	3.3	3.6	3.7	2.7	3.3	3.5	2.9	2.7	3.2
	min	2.7	2.5	1.7	2.0	1.8	2.8	1.8	1.9	2.8	1.5	1.9	1.6	1.7	2.0	1.7
	ave-rage	3.7	3.3	2.7	2.9	2.9	3.3	2.7	2.7	3.3	2.3	2.6	2.5	2.5	2.5	2.5

Source: Transparency International Global Corruption Barometer 2004, 2005

Appendix 2

Romania: Development of Corruption indicators

Year / Indicator	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
IT*	-	3.44	3.00	3.30	2.90	2.80	2.60	2.80	2.90	3.00
GRICS**	51.3	-	44.3	-	39.8	-	45.4	-	49.3	-

Source: * www. transparency.org.ro

** http://info.worldbank.org / governance / khz 2004 / indicator_report.asp

Chapter 7

The Implications of Corruption on the Economic Activities and the Public Sector Financing

7.1. Introduction

Corruption has been throughout the ages a widely spread phenomenon of all societies. The global development and globalization process have determined a closer analysis of corruption from the perspective of its evaluation and its consequences on economical and social process and political stability of a nation. Known sources have failed to give a unitary vision in defining the phenomenon of corruption. Yet, a series of aspects regarding this phenomenon has been unanimously accepted. The corruption is a phenomenon generated from the sphere of governance which appears mainly linked to monopoles of a product or service (Kligaard, 1998). Corruption is an abuse of civil servants for private advantages (World Bank); corruption that not manifest itself solely in the public sector. There has been a growing interest of the academic and research environment and international organizations (International Monetary Fund, World Bank) over the past few years to estimate the level of corruption

and underground economy of every nation. Some of the most important works on corruption levels in each nation and its implications on economic growth are: A. Krueger [1974][1], S. Rose–Ackerman [1975][2], P. Mauro [1995][3], P. Bardhan [1997][4], V. Tanzi [1998][5], Shang-Jin Wei [2001][6] etc. The effects of the two phenomena represent a strong reduction of each nation's own available funds and a reduction in the efficiency of using funds as well. In order to evaluate the corruption level of a nation, corruption indicators like international risk index for a country, calculated within the international country risk guide, based on "experts' opinions", corruption index calculated within the global competitiveness report and the world development report based on investigations on companies and citizens, the corruption perception index by Transparency International based on several "strong objectives or facts[7]". Values for the above mentioned indices do not offer significant differences. The value of the linear correlation coefficient for pairs of data series for nations over one year lies over 0.75.

The calculation of the corruption index of a nation is based on the answers of foreign businessmen who have businesses within that country. The most important of the indices used in the evaluation of the corruption level is Transparency International

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[1] Krueger, A., *The political economy of rent-seeking society,* American Economic Review, vol. 64, No. 3, June 1974.
[2] Rose-Ackerman, R., *The economics of corruption,* Journal of Public Economics, no. 5617, June 1975.
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[7] Shang-Jei Wei, *Corruption in Economic Development: Grease or Sand?,* Economic Survey of Europe, no 2, United Nations, 2001.

Corruption Index[8] (TICI). The values for this index vary from 1, for very corrupted nations, to 10, awarded for a nation which has no corruption. There is a strong dependence between the Transparency International Corruption Index (TICI) and the Human Development Index (HDI). Developed nations recorded low levels of corruption whilst for developing nations, corruption is a generalized phenomenon for the whole society. For example, regarding the data series of the TICI and HDI variables recorded in 2001 for the world nations, the value of the linear correlation coefficient is 0.77. The same index calculated for both data series in 2005 is 0.78.

Underground economy and corruption have existed in Central and Eastern European countries before 1989 taking several forms. Later transition processes towards a market economy have been accompanied by the development of new corruption mechanisms and the development of an underground economy. The privatization process during transition has determined important sources for the growth of corruption and underground economy. In 2001 in Romania almost 30% inhabitants lived in a state of poverty. In the same year, the corruption index places this nation within the group of East European countries of the highest corruption level.

In conclusion, "in the poorest nations, even though the underground economy has permitted the creation of a certain amount of jobs, in view to maintain a certain solidarity and family union, their excessive development represents a real hazard for the economy and the political system of that nation as well."[9]

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[8] In order to see the calculation of the indicators methodology: Lambsdorff Johann Graf, *Transparency International Corruption Index, Responding to the Challenges of Corruption*, Act of the International Conference, Milan, 19-20 November 1999, pp. 257-277.

[9] Germanangue-Debare, M., *Les pieges de l'economie souterraine*, Le Courrier de l'UNESCO, Juin 1996, pp. 22-24.

7.2. An analysis model of corruption impact

In macroeconomic studies dedicated to measuring the corruption impact on economic and social processes, the use of data and statistic analysis methods is inevitable. An efficient tool is given by macroeconomic models. Most popular are the models of Barro and Levine – Renelt. We will present some aspects of the two models as well as several derivate models in which a variable has been introduced in order to emphasize the impact of corruption on economic growth in general and on some special aspects of the economy like the evolution of investments, net exports and so on. In this chapter some results obtained from applying the two models for evaluating the losses of the economies from the old socialist block are presented.

7.2.1. The general model

The model developed by R. Barro[10] has been used to evaluate the losses of the economy of Eastern European countries during the period of planned economy. This model starts from the equation of economic growth proposed by the American economist R. Barro (1991). Within this model, GDP per capita (GDP_C) is determined as a measure of the development level of an economy depending on four factors:

i) The initial level of the index (GDP_CI), showing the initial development level of a nation;
ii) The primary training coefficient (PT);
iii) The secondary training coefficient (ST);
iv) The weight of government expenditure within the GDP (W_G).

This model gives a growing importance in determining the growth rate (second and third variable) and the fourth variable is used for control. In IMF simulations, a level of the weight of government expenditure within the GDP of 10% has been used.

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[10] Barro, R., *Economic growth in a cross-section of countries*, Quarterly Journal of Economics, vol. 106, pp. 407-443, 1991.

The Levine – Renelt model to evaluate the loss of ex-socialist nations in communist years is an econometric model developed by the economists Levine and Renelt (1992). This model differs from the first model by considering as a fourth variable the weight of investment within the GDP set by default at 30%.

Initial models can be used to evaluate the impact of corruption on a nation's economic and social environment, which can be defined using the regression model bellow:

$$Y_i = a_0 + a_1 Y_{0i} + \mathbf{a_2 X'_{1i}} + a_3 C_i + \mathbf{a_4 X'_{2i}} + \mathbf{a_5 D'_i} + \varepsilon_i$$
$$i = 1,\ldots.N \qquad [1]$$

The following symbols have been used:

- Y_i is a macroeconomic index globally characterizing the performance of economic activity of a nation (Gross Domestic Product per capita) or some special aspects of economy (Investment Volume, Net export per capita and so on). For a broader definition of economic and social performance of nations, the Human Development Index (HDI) is being used.
- Y_{0i} represents the initial level of GDP_C.
- $\mathbf{X'_{1i}}$ is a column vector which defines the initial characteristics of the human capital (for example, we can include here the primary training rate and secondary training rate and so on).
- $\mathbf{X'_{2i}}$ is a column vector which defines the characteristics of economic policies at national levels (the weight of government expenditure within the GDP as in Barro model, the weight of investments within the GDP as in Levine – Renelt model and so on).
- C_i is the corruption level of a nation using a certain index from the ones introduced above.
- $\mathbf{D'_i}$ is a set of dummy variables used to emphasize a series of regional characteristics.
- N represents the number of nations analyzed.

Using the above model, the following category of factors on economic and social processes of a nation are being shown: initial development level, the quality of the human capital of the initial period, the quality of decisions concerning economic policy, corruption and the regional characteristics defining the position of the nation.

7.2.2. Special models

Using two regression models based on panel data, the positive effects of membership to the E.U. structures are shown from the perspective of reduction of corruption. Reducing corruption determines a growth in quality of the economic environment and a growth of efficiency of public funds.

The particularities of regression models are linked to the following aspects: the dependent variable is the Human Development Index (HDI); the variable for measuring corruption index is TIC (Transparency International Corruption); estimating parameters data from 58 countries; the dummy variable has a value of 1 for an EU member and 0 for a non-EU country. Using the following regression models, the HDI growth is quantified further the reduction of the corruption level.

The regression model is defined by one of the following relations:

- When defining the model for all countries

$$HDI_i = \alpha_0 + \alpha_1 * IC_i + \varepsilon_i \quad [2]$$

where: HDI is the Human Development Index, IC is the Corruption Index determined by TI[11] and $\varepsilon_i \rightarrow N(0, \sigma^2_\varepsilon)$. The parameters of this model are estimated for data gathered between 1995 and 2006. Results are presented in Table 1, columns 1 and 2. Graphical representation for data series of 2 years is shown in Figure 1.

[11] Is an index measuring the corruption of a nation perceived by foreign investors. It varies between 0 (highest level of corruption) and 10 (lowest level of corruption). This index is calculated yearly by Goettingen University and Transparency International.

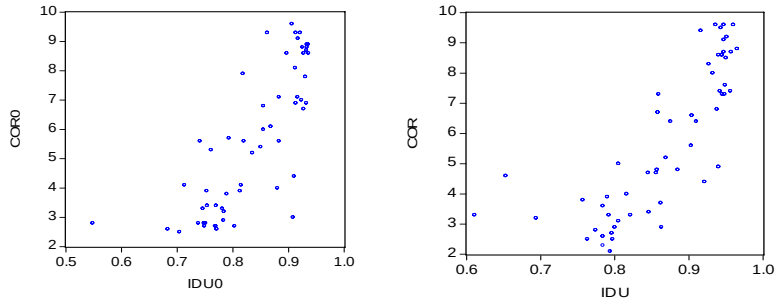

Fig. 1. *Graphical representation of HDI depending on COR (IC) for 1995 and 2006*

- For emphasizing the influence of EU membership, a dummy variable D is introduced.

$$HDI_i = \alpha_0 + \alpha_1 * IC_i + \alpha_2 * Di + \varepsilon_i \quad [3]$$

D takes the value 1 for EU membership and 0 for non-EU membership. Estimation for the parameters of the two years is presented in Table 2, columns 3 and 4.

Table 2

Characteristics of the regression models

	Model 1		Model 2	
	1995	2006	1995	2006
C	$0,680^{*}$ (0,018)	$0,7111^{*}$ (0,017)	$0,672^{*}$ (0,017)	$0,707^{*}$ (0,016)
COR	$0,0280^{*}$ (0,028)	$0,0270^{*}$ (0,003)	$0,0254^{*}$ (0,003)	$0,025^{*}$ (0,003)
D			$0,039^{***}$ (0,014)	$0,035^{**}$ (0,014)
R^2	0,62	0,64	0,66	0,68
D-W	1,97	2,1	1,87	1,97
AIC	–3,00	–3,105	–3,100	–3,18

* $\alpha < 0.01$; ** $\alpha < 0.02$; *** $\alpha < 0.06$.

Conclusions on the above obtained results are as follows:

- For both periods, a strong correlation between the development level of a nation measured by HDI and the corruption level can be observed, the linear correlation coefficient calculated for both years on the basis of data series takes the values 0.800 and 0.785.
- Corruption is weaker in EU countries (the parameter corresponding to the dummy variable is positive significantly differing from 0).
- Differences are relatively insignificant in regard to both periods if taking into consideration the four regression models and the values of the correlation coefficients calculated for data series of the same index for both periods. For HDI this value is 0.963 and 0.932 for IC.

We present a series of results obtained by estimating the above regression parameters for other two intermediate years, namely 2000 and 2002. In this case, emphasize is put on the lower corruption level of NATO countries which determines a higher level of development estimated by HDI. Graphical representations in Figure 2 show positive linear dependences between development level and corruption level for 78 NATO members.

Countries with a low level of living standard are characterized by a high level of corruption. Results of the estimations are being shown in Table 1. The positive non-zero value of the $\alpha_2 = 0.071$ estimator shows a positive influence of the low corruption level in NATO countries on the development level of that nation.

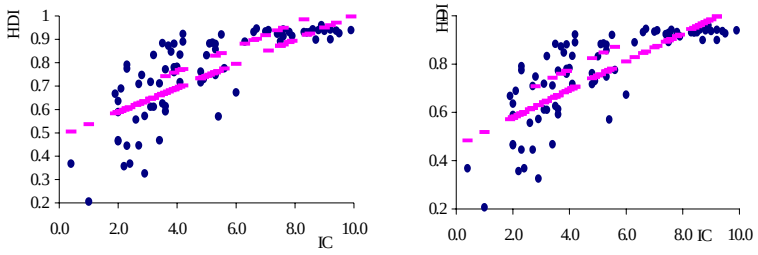

Fig. 2. *Graphical representation of HDI depending on COR for 2000 and 2002*

Table 3

Characteristics of models M_1 and M_2.

Model	Free term	IC	D	R^2	e'e
2000	0.485 (0.031)	0.052 (0.006)	0.071** (0.0034)	0.78	1.040
2001	0.461 (0.031)	0.058 (0.006)	0.083* (0.044)	0.77	1.051

* The parameter does not significantly differ from 0 for α = 10%;

** The parameter significantly differs from 0 for α = 5%;

The corruption level measured by IC for NATO aspiring countries is higher in comparison to NATO members. The following reasons support this statement:

1. The mean value of IC index is much lower for aspiring countries[12] compared to NATO members. Table 2 shows mean values of the index for two groups of countries and the average level of the national ranking that established nations by their corruption level (top position indicating the lowest corruption level) for the period 1998 – 2001.

[12] In the group of aspiring nations, countries have been included for which the corruption index has been regularly calculated: Estonia, Slovenia, Lithuania, Bulgaria, Croatia, Slovakia and Romania. For Albania the index value for 1999 was 2.3.

Table 4

Characterization of corruption for the two groups of countries

	1998		1999		2000		2001	
	$\overline{ci}$	$\overline{r}$	$\overline{ci}$	$\overline{r}$	$\overline{ci}$	$\overline{r}$	$\overline{ci}$	$\overline{r}$
NATO membership	7	22	7	22	7	22	7	23
	7.31*	19.1*	7.35*	18.3*				
Aspiring countries	3.6	54.2	4	52	4	44	4	47

$\overline{ci}$ mean value of CI for groups of nations. $\overline{r}$ mean rank. * if excluding the three countries, Hungary, Poland and Czech Republic which became NATO members in 1999.

2. No country from the group of aspiring countries is situated at mean level of the index calculated for NATO countries. The lowest corruption level has been measured in Estonia (mean value over the four years being equal to 15.7) and Slovenia (5.6). Romania has the lowest value of the index of the above nations. The mean values are: Lithuania (4.2), Bulgaria (3.6), Croatia (3.4) and Slovakia (3.4).

7.3. Components of the model of cost analysis of defence systems

In this part, the components of the costs of national defence systems for new NATO countries are being described. An economic approach on the national and regional defence system is used as basis in defining the analysis model rather than quantifying the cost of the defence system in an accounting manner as the total expenditure of the state to meet current demands for military equipment. Costs of the defence system are defined in a broader sense as economic losses due to instability within the national defense system derived from certain disfunctionalities and the lack of accession to mid-term and long term viable military structures.

In the economic literature, studies for evaluating the losses due to these disfunctionalities and inadequate function of any economic and military system have been made. It is worth to mention Barro [1989], Barro [1991], Barro & Lee [1993], Alesina & Perotti [1993a], Alesina & Perotti [1994], Gupta [1990], Gupta

[2001], Azam [1995], Varoudakis [1995], Levine & Renelt [1992], Grigorov [1999] and so on. Equally, the EU enlargement process and the process of adaptation of the single currency in some Western European states have stimulated several studies for evaluating the costs of these processes. The evaluation of economic and military costs of any conflict taking place on the territory of a country or near its borders is difficult to realize. Yet some estimation can be made[13]. For the estimation of losses during the wars of ex-Yugoslavia, a series of studies has been realized, mainly by Balls [1999], Lehman Brothers[14], Merrill Lynch[15] and so on.

7.3.1. Cost estimation for the NATO and EU enlargement

The beginning of Eastern Europe transformations was euphoric but soon difficulties began to emerge. While economic theories concerning the transition to a market economy based capitalist society from the socialist system were well-known, the political, economic and academic fields were taken by surprise by the radical changes in Eastern Europe. At that time there was no coherent theory or another example for the rapid transformation from a state economically governed in each country solely by the structures of the communist party towards a market economy system.

The economic reformation process of integration in Western military structures and EU economic structures has caused and will further determine considerable costs. To reach the three goals,

[13] The International Institute for Strategic Studies has estimated the costs of the main partners which have participated in the most important conflicts of the last century, namely World War I – 2850 billion dollars, World War II - 4000 billion dollars, Korean War - 340 billion dollars, Iran and Iraq War - 150 billion dollars, Gulf War - 102 billion dollars.

[14] The American Bank estimates by using a series of hypotheses that the minimum amount spent over one month of military action in Kosovo raised up to three billion dollars.

[15] This study estimates a daily cost of military actions of 200 million dollars. It is estimated that the cost of military actions in Kosovo raised up to 0.1% of the GDP of all NATO members put together.

candidate nations need and will further need considerable financial support from developed countries. On short term, the costs that are being covered by developed countries seem inefficient, but on long term the financial support given by the EU and NATO members represents an investment in a stable Europe. Looked upon from European perspective, taking into account the European development model, the integration of some nations or all Central and Eastern European Nations in the economic and military structures presents considerable advantages.

If the consolidation of the European model depends greatly on the success of the military and political integration, European problems are much more complex. That's why considering that Eastern and Central European countries act as a buffer between Europe and Russia, we underline the double importance of the accession of these countries to economic and military structures in the region. The accession to the EU represents a way of improving economic performance, by defining in each country economic structures that are able to ensure over a long period the compliance with economic performance criteria.

When elaborating a quantitative model for the evaluation of accession costs in NATO structures of nations from the old socialist block, an important element is defined by the level of economic development of each nation. Implicitly costs of each country accession into the EU economic structures and global accession costs will be taken into consideration. The costs for military accession will be supported only to the amount that each country can cover on medium and long term.

For determining the costs of accession to the EU, several different calculation methods have been accepted.

- For example, in the field of agricultural policies, the following estimations on the costs of extending the structural funds have been made for member countries of the Visegrad Group, Bulgaria and Romania. These estimations are very important because agriculture represents a very important sector for these countries. For example, in Bulgaria, 22% of the active population works in agriculture while 36% in Romania.

▪ Estimation for the cost of Romania and Bulgaria, Visegrad Group has been made considering the following hypotheses: treatment of these 6 countries on the same level as some cohesion countries (Ireland, Greece, Spain, Portugal). These countries received on average a mean value of 212 ECU per capita out of which 36 ECU were coming from the cohesion fund. When applying this amount on the population of the 6 countries, a total of almost 14.4 billion ECU emerges. This amount is over evaluated by comparison to the total activity volume of these countries, measured by the GNP (Gross National Product).

▪ In this case the ratio between the allocated fund and the GNP is 14.8%. The cost covered by the EU is for some countries greater than the contribution of this branch to the GNP. Given this over evaluation, another hypothesis was used, which took into account the distance between the economic performance of the two groups of nations. In this situation the allocated fund is reduced by 2.3% of the GNP. The cost level covered by the EU is 3.2 billion ECU, much lesser than the first scenario.

7.3.2. The components of the quantitative model for determining accession costs into NATO structures for candidate nations

The following types of costs have been identified in order to build the model for determining the cost of recent NATO members:

- Level I cost (the cost of maintaining a defense system at NATO standards);
- Level II cost (reconverting cost of economic system for armament production);
- Level III cost (cost associated with neutral position or non-accession into NATO structures);
- Level IV cost (neighborhood cost in times of peace).

Each cost is estimated using an ensemble of factors which directly contribute to its definition. The main reasons leading to this model definition are as follows:

- While a person is living in a "short time", the positioning and development of a nation or an economic region is judged over a long period of time. That is why designing a fragile, less costing defense system is in present times an added factor of economic and social instability for that nation or region on medium or long term.
- The cost of the defense system has to be approached in a global context of national economic stability. Not being a direct producer of national wealth, it contributes to it indirectly by favourising a stable social and economic environment.
- In the context of globalization, the national defense system contributes both directly and indirectly to the growth of opportunities for the integration in the EU economic structures. Although Romania has acceded on the 1st of January 2007, the integration process will be a long one.

The security cost is not a simple total of expenses in order to keep a functional national defense system but is a broader concept with has to be approached economically by looking at the positive and negative externalities, propagated in the economy and society. Starting from this observation, defense costs of the nations located in this region are regarded upon from the point of view of the integration process in NATO structures. From this perspective the following costs of the defense system of ex-socialist NATO members are defined:

1. Level I cost or the cost of the national defense system in this narrow sense.
2. Level II cost or the cost of the national defense system at the level of NATO requirements.
3. Level III cost or non-accession costs into NATO structures.
4. Level IV cost or economic neighborhood costs with Russia covered by NATO members.

The main aspects regarding the quantification of the four cost types are presented. The main difficulty consists in building the data series for variables used for characterizing the costs of national defense systems.

A. Level I Cost

Level I cost or in a narrow sense accession costs into NATO structures are formed out of all supplement expenditures which every country has to cover for adapting its national defense systems to Western standards. In order to successfully complete this adaptation process, national economies of candidate nations have to be stable and viable. Not surprising, the first three nations of the old Warsaw Pact which have been accepted as NATO members are those with the most advanced economic reforms. Moreover, Poland has allocated constantly between 1990 and 2004 at least 2% of its GDP for the national defense system (excepting 2000 – 1.9%).

For example, one of the objectives set by NATO for the accession process of Estonia was the allocation of 2% from the GDP for military expenditure since 2002. Between 1992 and 2004 Estonia had allocated from 0.5 to 1.8 % of its GDP for the defense budget (excepting 2003 – 1.9%).

Table 5

Percentage of Estonia's military expenditure from GDP (%)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
	0.5	0.8	1	1	0.9	1.1	1.1	1.3	1.4	1.6	1.7	1.9	1.8

Source: SIPRI.

In 2004, Estonia's GDP for 2004 reached 181 mil. US$.

In the last years, NATO candidates have participated in several humanitarian operations in Afghanistan, Kosovo and so on along with NATO forces. The expenditures have been mostly covered by these nations. For example, for humanitarian operation, quoting the National Defense Ministry of Romania, costs are estimated at 25-26 million dollars.

From the perspective of NATO integration, the level I cost of these nations can be calculated as follows:

$$C^I_t = C^1_t + CS^1_t * 1^N_t \quad [4]$$

where: $C^1_t -$ is the actual cost of the national defense system in the narrow sense, represented as part of GDP allocated to the national defense system, the additional cost is supported by each state to adapt to the requirements of NATO and is a binary variable that has value 1 if the country is included in the alliance, and 0 otherwise.

Current economic systems, especially complex systems, depend to a large extent on a set of factors that ensure a climate suitable for economic and social conduct of economic processes. The National Defense system contributes to economic and social processes. For example, the terrorist attacks of September 11 at World Trade Center can not be viewed strictly as causing losses, but, among others, "can be translated through a decrease of 14.4% of shares in a week, and downsizing the activity of transport companies, hotels and places of tourism."[16]

Given that most countries in recent years included in the NATO countries have not found an economic stability, creating a viable national defense is an important factor of stability. Therefore, in calculating the cost of defense, the effects induced by the neighborhood system will be taken into account. If the effects of neighborhood integration process are taken into account, than the cost of the national defense system is defined in a broad sense through the following:

$$CE^I_t = C^1_t + (CS^1_t - EV^N_t) \cdot 1^N_t - EV_t \cdot (1 - 1^N_t), \quad [5]$$

where: $CE^I_t -$ is the cost of the national defense system in the broad sense, as regarded in the light of actual expenditure, and the effects propagated on the economic, social, level,

[16] James K. Galbraith, *The Meaning of a War Economy*, Science economique, no. 2748, 2002, p. 1.

EV_t^N - neighborhood effects induced in the economy by the country's NATO integration and EV_t – neighborhood effects induced in economic and social system by the current national defense system. Neighborhood effects[17] may be positive, negative or neutral. They can be measured by GDP growth in a given period. Barro, Levine-Renelt models to be applied subsequently quantify losses of former socialist countries during the totalitarian system. Andrei's model quantifies the losses of an unbalanced economic - social system on short term. To a certain extent, these economic losses can be made on account of the negative effects of a national defense system vulnerable to sudden changes at the level of civil society. Induced effects in the economy and society by the process of joining NATO are observable on short term. For example, a series of economic measures to reduce corruption are taken. S. Gupta estimated the effects of corruption on the economy concerning the military budgets[18].

On short term, $CE_t^I > C_t^I$ due to additional costs resulting from the endowment and reforming the national defense system, but on medium and long term, $CE_t^I < C_t^I$, due to neighborhood effects resulting from the inclusion of a country within a modern system of defense.

For most countries that joined NATO, an increase in military expenditure is an effort supported by economy, when the mechanisms of market economy are far from working properly. However, in absolute value, military budgets are below those of the period in which these countries were part of the Warsaw Treaty. With few exceptions, military budgets for recently acceded countries are restricted by the decrease in economic activity.

[17] Hal R. Varian, *Intermediate Microeconomics*, W.W. Norton & Company, New York, London, 1993, pp. 546-600.

[18] Gupta, S., Luiz de Mello, Sharan, R., *Corruption and Military Spending*, European Journal of Political Economy, vol. 17, 2001, pp. 749-777.

"Ministries of Defense and National Economy have a crucial role in building the budgets for defense".[19]

In 1997, Lithuania has allocated to defense 0.8% of GDP, while for 1999 it was 1.31%. For both years, most of the budget (71.3% in 1997 and 73.6% in 1999) was allocated for operational costs. To purchase major equipment 15.0% of the defense budget has been allocated for 1997 while for the next year, the allowance was 6.4%.

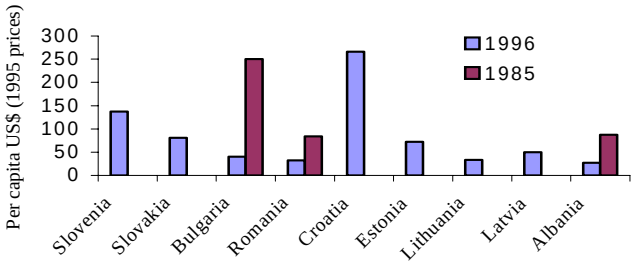

Fig. 3. *Military expenditure per capita*
(Source of data: Human Development Report 1998, Oxford University Press, 1998)

The indicators that can be used to assess each country's efforts in national defense: the share of military expenditure in GDP and military expenditure per capita. In relation to the second indicator, in the hierarchy of the world, the East countries have a lower position than developed countries; the value of this indicator is, for most countries in this geographical region, almost 20 times less compared to USA or France. As shown by Figure 2, even among these countries there are significant differences. With the exception of Croatia, which recorded higher values than the other countries as the country is situated in an area of extreme instability,

[19] Background information on the Lithuanian National NATO Integration Programme 1999-2000 (NNIP), p. 4.

the other countries, have reduced the values of this indicator over the past decade. For most countries in Eastern continent, the decrease is due to a large extent to reducing GDP, and reducing military budgets in the share of GDP. For example, Bulgaria has reduced the value of this indicator over a decade, from 250 U.S. $ / capita in 1985, to 40 U.S. $ / capita in 1996. For Romania and Bulgaria, countries aspiring to integrate into NATO in 2002, the development of personnel of national armed forces during the period 1988-1999 is different. According to SIPRI[20] data for the two countries, a chart was drawn in Figure 4.

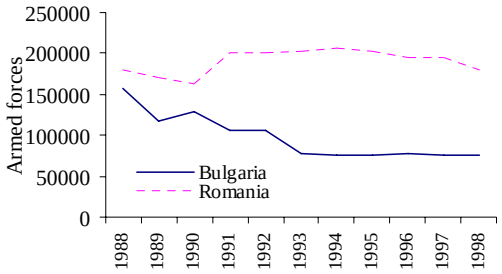

Fig. 4. *Total armed forces in Romania and Bulgaria*
(Data Source: SIPRI)

In 1992, armed forces personnel[21] in total employment represented 2.3% in Bulgaria, while 1.6% in Romania. Five years later, the two countries have reached the same value of the indicator, namely 1.9%.

[20] For all armed forces from the series of data provided by SIPRI and UNDP through Human Development Report 2001, 1990 there are significant differences for the two countries. For example, for the period 1995-1998, the series of data for the two countries, in thousands of persons are: Romania 217 (201.8), 228 (195.9), 227 (194.45), 220 (194.45), 207 (179.7); Bulgaria 102 (76.2), 104 (77.8), 102 (75.8), 102 (75.8). In parentheses we find SIPRI value. As remarked, for both countries, the values are lower when using SIPRI series.
[21] World Development Indicators, 2001, pp. 294-295

To compare the two countries that have military potential among acceding countries, an econometric model is built with panel data, which aims to explain the development of the budget for military expenditures in relation to two important factors: the evolution of GDP as a major source for supporting the defense system and dynamics of military staff of the two countries during 1988-1999. In these circumstances, we define the econometric model:

$$DE_{it} = \alpha_i + \beta_1 \cdot GDP_{it} + \beta_2 \cdot AF_{it} + \varepsilon_{it}, i = 1,2 \quad \varepsilon_{it} \to N(0,\sigma_i^2) \quad [6]$$

In order to analyze the dependence between the three variables, the parameters of model [6] are estimated by MCMMP (OLS) without free common term, with free common term and with the model with fixed effects. Table 6 presents the results.

Table 6

	Model		
	No free term	With common free term	With fixed effects
c	-	*−129.74** *(114.78)*	-
gdp	*−19.48* *(7.64)*	*−21.04* *(7.71)*	*−22.99*** *(13.24)*
af	*8.28* *(1.25)*	*9.34* *(1.55)*	*8.69* *(3.9)*
R^2	*0.770*	*0.781*	*0.79*
$\bar{R}^2$	*0.757*	*0.760*	*0.740*
LL test	−119.1	*−116.88*	*−116.8*
Fixed effects _ *Bude*	-	-	*−56.51*
_ *Rode*	-	-	*59.1*
F-test	60.28	31.24	58.97

1. The parentheses contain the standard errors for each estimator. 2. The symbol. *Marks parameters which do not significantly differ from zero, for a significance threshold of 10%.

**Marks parameters significantly differing from 0, only for a significance threshold of 10%.

For the first two models we remark that while the reduction in GDP led to an appreciable reduction for both countries of defense expenditures, maintaining military staff at certain levels led to military budgets at certain levels. According to the parameter of the third model with fixed effects, we remark that in the case of Romania, it is positive, while in the case of Bulgaria, it is negative.

B. Level II Cost

Level II costs are taking into account the transformations in the economic system of national defense. These costs are directly related to the defense industry in each country. They consist of costs related to restructuring and privatization of economic units specialized in the production of armament and materials for the Army, as a result of agreements and criteria for accession in NATO structures. After the end of the Cold War, the armament industry in the world has undergone radical transformations. For countries in East Europe, level II costs are assessed taking into account:

- Worldwide, military expenditures continuously decreased that implicitly generated major changes in the armament industry. These changes were felt even by the great military powers. For example, in the U.S. during 1987-1994, in this industry around 1150000 jobs were lost. For an overview concerning the importance of sustainability of defense system in promoting exports, we present some comparative figures for the USSR and U.S., military powers which had before 1990 around 75-80% of world armament market. In 1984, the Soviet Union had 26.9% of world armament market, while U.S. 22.0%. During 1993-1997 Russia's export diminished by 13%, while the U.S. had the monopoly of 47%[22]. According to military experts, the progress in military technology held by the U.S. represents 15-20 years in relation to all partners or potential opponents;

- A continuous increase of the cost of weapons systems is recorded. Moreover, importers of weapons "will not only buy a

[22] Stockholm International Peace Research Institute (SIPRI), Yearbook 1998, Oxford University Press, 1999, p. 294.

product but a service, sometimes doubled by security guarantees".[23] Countries in this geographical area, in search of security guarantees have reduced substantially export due to new requirements in the market for armament and military systems. For example, in 1992, the share of exports of weapons in Romania's total exports was 0.5%, decreasing in 1997 to 0.1%. During the same period, the share of armament in total imports increased from 0.6% to 2.2%. The same trend is observed in the case of Bulgaria, for export from 3.1% to 2.4% and import from 0 to 0.2%. In the communist period, many developing countries bought military equipment from the USSR or the member countries of the Warsaw Treaty.

- The production of military equipment was affected in the early 1990s by disappearance of Warsaw Treaty. For example, between 1991-1993, the Bulgarian armament industry was in a serious recession. This country, during the period of the Treaty, was involved primarily in the repair of military material. Slovakia recorded a high potential in the military industry during the Cold War, but since its production was focused mainly on markets in the Middle East, Latin America etc., it has not felt immediately the abolishment of Warsaw Treaty. In 1990s Slovakia attempted reconversion of the military industry to civil products, and upgraded this industry according to the current requirements. In early 1990s, we remark the downsizing of market in Eastern European countries at the same time with the collapse of the socialist empire. It is a consequence of the trends in the world: the export of armament is done largely by countries which also provide an "export" of security. Moreover, countries in Eastern Europe became importers of military systems and technology in order to adapt to new military requirements. Disappearance of the socialist block represented the beginning of a period of reconfiguration of the weapons and defense systems. The table below shows the volume of import and export of armament for Romania and Bulgaria:

[23] Ludovic Woets, *La defense en Europe*, L'Harmattan, 2000, p. 340.

Table 7

Imports and exports of armament of Romania and Bulgaria

	Export of armament (mil. US $)		Import of armament (mil. US $)		Export-Import	
	Romania	Bulgaria	Romania	Bulgaria	Romania	Bulgaria
1988	220	430	40	400	+	+
1989	80	240	20	290	+	-
1990	0	80	825	675	-	-
1991	0	110	170	0	-	+
1992	20	120	40	0	-	+
1993	10	80	0	5	+	+
1994	40	60	0	0	+	+
1995	20	140	10	0	+	+
1996	20	100	20	150	0	-

Source: SIPRI; + when export> import, - for contrary situation.

According to SIPRI, during 1990-1996, the import of armament exceeds export for the two countries. This is mainly due to massive import of armament in 1990, consequence of the tests made by the two countries as a result of the unstable situation created by the collapse of the socialist system. Throughout the period there is a considerable reduction of the export of armament for both countries.

- The status of the defense industry represents the result of the transition from centralized economy to market economy. For example, Romania has an armament industry of poor quality from technical point of view. In the socialist period, Romania, desiring to have a certain independence in the Warsaw Treaty, has developed its own defense industry. Due to continuous reduction of military budget in the transition period, the enterprises producing military equipment decreased continuously their activity. Moreover, due to downsizing of internal market and relatively outdated technology, major difficulties have been encountered even in the shift to the civil market. Due to the difficulties of transition by reducing the activity or closing units specialized in the production of armament, Romania lost a high quality engineering potential. In order to reduce the effects of the transition of this sector, Romania concluded agreements of

cooperation with foreign companies aimed to repair or upgrade the military equipment: Alouettes and Pumas, Manurhin, Matra, etc.;

- Some Eastern European countries reduced the production of armament while the Baltic countries (Estonia, Latvia, Lithuania) and Slovenia did not have their own armament industry.

C. Level III Cost

Level III cost or cost of non accession to the NATO structures includes costs supported by each country that is not a member of a viable military structure in order to ensure the country's defense against a possible attack from abroad, and also to propagate peace and social security. Any war in East Europe is directly felt by the countries involved, and also indirectly, through economic and social levers by neighboring countries. Equally, Western European countries are affected by military costs arising from military operations aimed at military conflict management in the immediate neighborhood, as well as the economic costs as a result of downsizing the economic activity in adjacent areas, etc. In this study we present some methodologies for calculating the costs incurred by NATO countries in Kosovo war.

We present some modalities to quantify the losses registered by a country, due to the lack of a viable defense system which should take into account the realities of this area. Level III costs consist of three categories: cost of conflict situation, cost of neighborhood with a conflict area and cost of instability in a region.

The three categories of costs are defined as follows:

- The costs of conflict situation and the costs of neighborhood with a conflict area are the costs incurred by a country participating in a conflict or a neighbor to a conflict zone. They are costs estimated directly by increasing the defense expenditures and diminishing the economic performance. These costs are supported by a country situated in an area with military conflict. The best known example in order to analyse the consequences of war is Yugoslavia. This country, within less than ten years, was directly involved in two wars that led to the

dismantling in several independent republics as well as to decreasing the economic living conditions in Serbia and Montenegro. A country with the highest development in Eastern Europe, Yugoslavia recorded a considerable recession due to war. At the end of the 1980s, Yugoslavia was a medium developed country, where average income per person was 4000$ and ten years later, the average income was 1500$ per person. Domestic and foreign debt of Yugoslavia represents 150% of GNP, "in other words Yugoslavia must work more than a year to make debt cancellation! According to Dr. Pitic, we have to add between 11 and 12 billion U.S. dollars in non-reimbursable bonds to foreign debt and 16 billion dollars (foreign debt, relatively old)."[24] The biggest loss for the former Yugoslavia is the territorial fragmentation. If at the end of the 1980s, the European Community was interested in enlargement towards Yugoslavia.

- The costs of instability are the economic costs resulting from placing the country in a volatile strategic area, not suitable for an economic activity. Unlike the first two categories of costs, they do not assume a conflict situation in a country or area, but a lack of confidence in the economic and financial environment, in an economic and military stability on medium and long term. They are estimated economically through loss of GDP per capita as a result of the perpetuation of instability status in an area, due to the inclusion of the country in economic and military systems non-viable on medium and long term. This cost is difficult to assess, as the difference between the achieved and designed level by an econometric model will be shared between the various economic and extra economic factors, including the military factor. Including a country from this area in the structures of NATO was a positive signal for the economic and financial environments in view of development.

For all countries in the crisis region, even if not directly involved in the hostilities, the experts consider three important

[24] Vesna Kostic, *L'économie surendettée de la Yougoslavie*, Economie internationale, no. 2620, 1999, pp. 18-19.

mechanisms for transmission, directly or indirectly of negative effects of war or instability in this region:

I) Foreign trade records a significant recession in this region through the interruption of economic relations totally or partially with the country involved in war or other countries representing a transit territory. For example, in the war in Yugoslavia, stopping navigation on the Danube due to bombing four bridges resulted in significant losses to riparian countries on the economic level.

II) Local and foreign investments are affected directly. A considerable reduction of the volume of foreign investments has been recorded as a direct result of increasing country risk. Also the costs for the contracting loans from foreign financial markets have increased. These costs are even higher as the countries of this region are directly involved in the privatization process that requires the participation of foreign investors.

III) The expenditure for defense and public order: due to instability, the direct expenditure for maintaining internal and external security have increased. For example, further the conflict in Kosovo, in Albania there were 365 thousand refugees (representing more than 11% of the population of this country), in Macedonia - 133 thousand refugees (7%), in Bosnia-Herzegovina 32 thousand (1%) and in Montenegro - 74 thousand refugees (12%). This exodus of people has created economic and social problems to countries already in economic difficulties due to transition to market economy.

The three effects are included in the model by means of the variable of external shock. For example, in Yugoslavia, due to conflict situation and internal application of economic mechanisms specific during 1989-1998, GDP decreased to a half. According to expert V. Gligorov[25], neighborhood effects were felt in the economies of countries in this area. Thus, due to these

[25] WIIW, Wiener Institut fur Internationale Wirtschaftvergleich, quoted in *Der Kosovo-Krieg wirft die gesamte Region zuruck*, Neue Zurcher Zeitung, 19/4/1999.

neighborhood effects, GDP reduced by 5% in Bosnia and Macedonia, by 2% in Bulgaria and Albania and 1% in Croatia.

The war in the Balkans represents a reason for reflection in countries that are not included in an effective defense system, but, equally, for the EU that supports either directly or indirectly a part of costs of war in this area. Costs of adjacent countries, estimated by macroeconomic indicators are presented in Table 8.

Table 8

	GDP	Export	Trade deficit	Labor	Cost for budget (% GDP)
Albania	-2	-	-	-2	-
Bosnia-Herzegovina	-5	-10	+5	-	+5
Bulgaria	-2	-10	+20	-2	+2
Croatia	-1	-10	+10	-1	+2
Macedonia	-5	-15	+20	-2	+2
Romania	-0.5	-2	-	-	-

Source: Grigorov and Sundstrom, 1999

The war in the region stressed a number of imbalances in these countries, undergoing the process of economic transformation.

If a country in the region is directly involved in conflict, the costs are incalculable. For any country in this area, that has not solved the economic problem, vital to strengthening the democratic system, participation in a war could lead to very high costs. In this context we mention a few milestones:

i) the war can generate and enhance regional ambitions in the country, the destruction of significant industrial installations or telecommunication and transport system; high costs for reconstruction. For example, in the case of Yugoslavia, it is estimated for the next five years an amount of 25-30 billion dollars for reconstruction, and for the next 15 years, an amount of almost 90 billion dollars. According to estimates made by G17 group of economists, the states of former Yugoslavia can not reach the level

of development from 1989 until 2010-2015. The European Commission has estimated for the reconstruction of Kosovo, 1 billion euros per year for three years[26].

The losses on the economic level in times of peace, as a result of non accession of a country to a viable military system, are estimated by four methods. The first two methods quantify economic losses for the countries of the former socialist block in the planned economy, the integration of the Warsaw Pact or the acceptance of status as neutral economic and military country. These methods offer a global cost for the socialist experience over two generations. Losses are found in long-term effects of the centralized economy, and as a result of artificial operation of the Warsaw Pact for the countries in the region. The economic losses recorded by Eastern European countries are based on non-variable economies, membership to economic and military structures (CAER and the Treaty of Warsaw) which did not take into account the realities of the modern world.

Method I. It is a method based on the equation of economic growth, proposed by U.S. economist R. Barro (1991)[27]. GDP per capita is determined as a measure of economic growth, depending on the following four factors: i) the initial level of the indicator as a measure of the initial development of the country ii) the rate of primary education level; iii) the coefficient of secondary education level iv) the share of government expenditure in GDP. This model attaches great importance to the human factor in determining the rate of growth (second and third variables), and the fourth variable is a control one. In the simulation conducted by the IMF a level of government expenditure share in GDP of 10% has been taken into consideration.

Method II. It is also an econometric model developed by Levine and Renelt economists (1992) which differs from the first model by replacing the fourth variable with investment share in

[26] Economist Intelligence Unit, 1999, pp 42-43.
[27] Barro, R. *Economic Growth in a Cross Section of Countries*, Quarterly Journal of Economics, vol. 106, no. 2, May.

GDP. For this variable a level of investment in GDP of 30% has been taken into consideration. It is a model that attaches importance to higher investments in the economy.

Table 9

Losses recorded in the socialist economy measured by Barro and Levine-Renelt

	Losses calculated by Barro equation		Number of years lost, calculated by Levine-Renelt equation
	GDP per capita	Number of years	
Bulgaria	9 946	26	25
Czechoslovakia	9 000	15	18
Poland	9 858	21	24
Romania	10 537	31	30
Hungary	9 810	20	21
The average for socialist countries	9 785	23	24

The growth rate of Czechoslovakia is calculated as the average of Czech Republic and Slovak Republic.

Method III. Estimating the economic losses due to subordination of the army to a political structure and artificial participation to civil projects. A consequence of this situation is the fragility of the economic system, vulnerable to political changes. It is valid for most countries in Eastern Europe. For example, in Romania, 1990 marked the beginning of a period of pronounced economic decline. Only some of these economic losses are attributed to the military itself: before 1989 the army subordinated to the political system, participated in the creation of economic objectives (Palace of the Parliament, Danube - Black Sea Channel, etc.) having a direct contribution to the sudden change of political system in Romania.

Using Romania's GDP during 1975 - 1989[28], the econometric equation with trend is represented by:

$$GNP_t = \underset{(156.49)}{251.951} + \underset{(0.237)}{0.518} \cdot GNP_{t-1} + \underset{(7.37)}{20.320} \cdot t \quad (F = 31.754) \qquad [7]$$

[28] During this period, in Romania, the macroeconomic indicators are calculated in the Material Production System.

In brackets under each estimator, the standard errors of estimators are written. Values of Student statistics, calculated for the three estimators show that the three parameters are significantly different from zero.

Table 10 presents the achievements and forecasts based on the above estimation for the next two years after the Romanian Revolution in 1989:

Table 10

Losses of Romania in the first two years after the revolution

	GNP_t (billion. lei) [1]	Anticipation [2]	GNP_t / GNP_{89} (%) [1]/ GNP_{80}	GNP_t / GNP_t^{estim} (%) [1]/[2]
1990	755.194	927.80	93.58	81.39
1991	745.832	976.41	92.54	76.49

The values in the last column of the table show a significant decrease of the economic results of the Romanian economy in 1990 and 1991. The decrease recorded on the economic level represents the result of the disruption occurring in a planned economy concurrently with the occurrence and development of a competitive economic environment. Removing the role of the national defense system of Romania from the economic civil activities determined directly and indirectly downsizing of economic activity in Romania in the first years after revolution. The main arguments are as follows:

i) in the communist period, especially during the 1980s, the Army had a strong role in the economy.

ii) industrial institutions subordinated to civil institutions and Ministry of National Defense participated actively in the export of Romania, contributing to pay the external debt of Romania during the socialist period;

iii) army participation in the movements in December 1989 contributed to increased tensions in that period, even if the military intervention was welcomed.

iv) in less developed countries or developing countries the army has a major role in sustaining a totalitarian regime; in fact,

during the communist period, the army was directly controlled by the Communist Party through the party structures from military units.

Method IV. It is based on the analysis of rates of growth of GDP for Eastern European countries through panel data. In order to achieve the model of analysis of the losses arising from the inclusion of these countries in economic and military systems, non-viable to the modern world requirements, the following issues are taken into account:

1. The artificial character of supranational economic and military systems has led to the collapse of the socialist system in a short period of several months;

2. For most countries the disintegration of socialism marked the beginning of radical changes on economic, political, military and social level;

3. Yugoslavia, a country neutral economically and military, recorded two costly wars that led to increased degradation of living conditions in this country in less than 10 years;

4. The collapse of the socialist system has led to the emergence of new states;

5. In order to achieve the model, we use the following variables:

- $igdp_t$ - the index of GDP growth compared with 1970. For this variable, data were used during 1970-2000 for Albania, Bulgaria, Hungary, Poland and Romania. In the model analysis only countries that have not suffered territorial transformations since 1989 were included. For this variable, series of data from the WEO were used.
- $time_t$ - with values between 1 and 31, in order to identify any trend in the evolution of the $igdp$ indicator.
- VBT_t - is a dummy variable that takes value 1 for a value of the indicator registered in 1989 and 0 for 1988.

6. The model is represented by one of the following regression equations:

- When a global analysis for the development of GDP is achieved, without taking into account the differences between the five countries, the regression model is as follows:

$$igdp_t = a_0 + a_1 \cdot igdp_{t-1} + a_2 \cdot time_t + a_3 \cdot VBT_t + \varepsilon_t \qquad [8]$$

- Regression model with panel data with fixed effects (the fixed effects model)

$$igdp_{it} = a_i + a_1 \cdot igdp_{it-1} + a_2 \cdot time_{it} + a_3 \cdot VBT_{it} + \varepsilon_{it}$$
$$i = 1,...,5, t = 1,...,31, \ \varepsilon_{it} \to N(0, \sigma_\varepsilon^2) \qquad [9]$$

- Regression model with panel data with random effects (the random effects model)

$$igdp_{it} = \mu + a_1 \cdot igdp_{it-1} + a_2 \cdot time_{it} + a_3 \cdot VBT_{it} + a_i + \varepsilon_{it}$$
$$i = 1,...,5, t = 1,...,31, \ \varepsilon_{it} \to N(0, \sigma_\varepsilon^2), a_i \to N(0, \sigma_a^2) \qquad [10]$$

7. Before using regression models with panel data, some descriptive characteristics of the evolution of GDP for this group of countries are presented. In order to simplify the presentation in Figure 5, the evolution of indices of GDP growth is revealed for the five countries incorporated in the study.

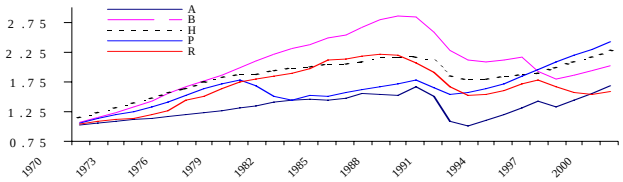

Fig. 5. *Indices of GDP growth during 1970-2000 compared with 1969 for Albania, Bulgaria, Hungary, Poland and Romania*
(Source: WEO, 2002)

During 1970-1989, with the exception of Poland, which has recorded an economic decline in the beginning of 1980s, the other four countries had significant growth ratios for GDP. Albania, country with the lowest level of GDP per capita, registered the

lowest growth ratio. For the five countries, the average annual growth ratio during 1970-2000 was: 2.74% for Albania, 5.67% for Bulgaria, 4.2% for Hungary, 3.1% for Poland, 3.9% for Romania. 1990 marked a strong rebound for Eastern European countries. Bulgaria, Romania and Albania felt stronger the economic effects. During the period of transition to market economy, Bulgaria has reduced the activity in economy, on average annually, by 2.23%, while Romania by 1.69%. Hungary and Romania, due to greater openness to Western European economies have succeeded the recovery in 1993, 1994. During the period 1990-2000, the two economies have recorded annual positive average ratios of GDP growth. Moreover, stable development of the economies of both countries, alongside the Czech Republic, represented essential elements for acceptance into NATO structures since 1999. The events of the past 18 years have shown that the status of neutrality or joining a military or economic system represent certain elements for the emergence of economic and social imbalances on medium and long term. The losses are quantified by the emergence of smaller states within the territory of current states, the emergence of local military conflicts, reducing the economic activity, etc.

The table below presents the regression model used to analyze the evolution of index of GDP growth for five countries in Eastern Europe, following the transformations in 1989, which have not undergone territorial transformations.

Table 7.

Equation for indices of GDP growth

	Models			
	No free term	With common free term	With fixed effects	With random effects
c	-	-0.0279^{*} (0.0450)	-	-0.01256^{*} (0.0454)
igdp	0.9323 (0.0197)	0.937 (0.0211)	0.866 (0.0283)	0.920 (0.0234)
time	0.0045 (0.014)	0.0053 (0.0020)	0.008 (0.0019)	0.006 (0.0019)
VBT	0.1176 (0.0203)	0.1310 (0.0295)	0.1612 (0.0296)	0.140 (0.0294)
R^2	*0.951*	*0.951*	*0.956*	0.953
$\overline{R}^2$	0.950	0.950	0.954	0.952
LL test	260.5	260.78	275.39	275.99
e'e	*1.16*	1.16	1.05	1.12
Fixed effects				
_Alg dp			-0.035	-0.018
_Bugdp	-	-	0.071	0.0129
_Hugdp	-	-	0.051	0.0082
_Pogdp	-	-	0.029	0.0035
_Rogdp	-	-		
Estimation method	MCMM		0.0090 MCMMP	-0.0065 MCMMP
Number of observations	30		30	30
Number of observations panel type	-	MCMMP 30 -	150	150
F-test	1437.7	954.5	4125.67	-

Remarks: 1. In parentheses the standard errors for each estimator are listed 2. * represents the values which do not differ significantly from zero for a significance threshold of 10%.

The first two models, whose parameters are estimated by MCMMP (OLS) emphasize an economic growth of GDP during 1970-1989. The first two models provide an accurate estimation of *igdp*. The estimators of variables *igdp* and *UBT* are positive and differ significantly from zero. By using both models we obtain the same conclusion, that the changes in 1989 have determined a reduction in the pace of growth for the Eastern European countries. For both models more than 95% of changes in evolution of variable *igdp* are explained by variables included in the regression models. In order to emphasize the changes in each country, two models with panel data are used: one with fixed effects, with parameters estimated by MCMMP and the second with random effects, estimated by generalized MCMMP (GLS). For these two models, the high values of F statistics emphasize that the variables retained in the models provide an adequate estimation for the dynamics of GDP index.

D. Level IV Cost

The level IV cost or the cost of the neighborhood during times of peace with Russia represents the economic losses recorded by the NATO countries due to hostility expressed towards Russia. These costs are inverse proportional related to distance to Russia and direct proportional to the dependence on the economic system of Russia. To take into account the size of these losses, we consider that Russia is an important supplier of natural gas to the countries in this geographical area. This cost is much higher for the Baltic countries.

For Eastern European countries, former USSR represented an important market and a major supplier of raw materials and natural gas during the planned economy. CAER collapse and disintegration of political structures that governed relations between these countries have led to a strong rebuff of trade relations with this economic partner.

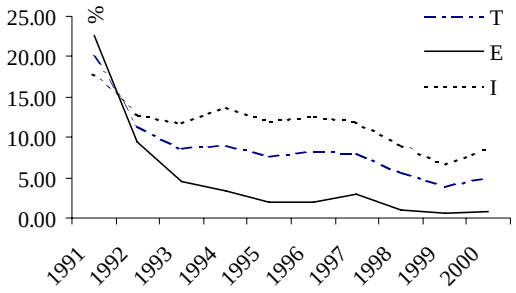

Fig. 6. *Evolution of the share of import (I), export (E) and external trade (T) of Romania with Russian Federation in the import, export and external trade of Romania during 1991- 2000*
(Source: Romanian Statistical Yearbook, 1995-2001)

In Romania, since the collapse of the communist system, there was a clear trend of distance against Russia. If in 1989, 26.6% of Romania's foreign trade was done with the former Soviet Union, within a few years, the trade relations between these countries have decreased dramatically. The chart in Figure 6 shows these trends. Moreover, export of Romania to Russian Federation has decreased continuously, reaching in 2000 less than 10% of total export in 1991. Due to the economic policy applied during the first years after the revolution, Romania lost a major market.

For Romania, the opposition of Russia to join NATO could be felt on the economic level through the policy of prices of raw materials imported by Romania. In 2000, a share of 8.58% from Romania's import is from the Russian Federation, represented especially by import of natural gas and raw materials.

Equally, during 1990-2001, Eastern European countries tried to have to greater extent Western European countries as business partners. Imports of these countries are to a large extent from Western Europe and the USA. The same applies to foreign investments. For example, Slovakia, which during the planned economy achieved the trade especially with the Czech Republic

and Russia, now records 46% with the EU countries. Among the countries of the former socialist block, only Hungary, Poland, the Czech Republic and Slovakia "have succeeded in developing the export of machinery and equipment, while the Balkan countries have remained specialized in industrial intermediary products (metallurgy)".[29]

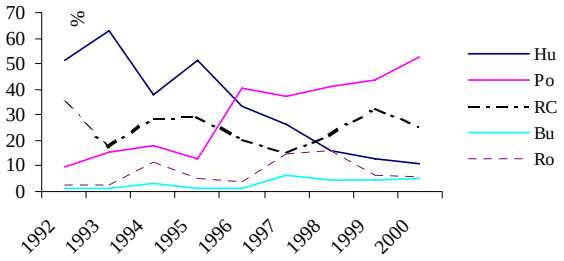

Fig. 7. *Distribution of foreign direct investment among Poland, Hungary, Czech Republic, Romania and Bulgaria*
(Source: Economic Survey of Europe, no. 1 / 2000, 1 / 2001)

Membership of Eastern European countries to NATO in 2002 represents an important factor in encouraging foreign capital investments. If in the early 1990s, the foreign capital was 479 million U.S. dollars, in 1999 it increased to 16.8 billion U.S. dollars. The three countries that were included in NATO in 1999 hold the highest share. "During 1987-1998 the European companies invested in PECO-5 countries (Poland, Hungary, Czech Republic, Romania and Bulgaria). German companies hold the first place, with a flow estimated at 11.4 billion ECU, representing 43% of Europe-15 commitments. They are followed by the French (10.9%), Dutch (10.6%) and Austrian (8.7) companies, as well as

[29] Agnes Chevallier, Francoise Lemoine, Laurence Nayman, *L'Union européenne et sa périphérie. Conséquences de l'intégration commerciale de l'Europe centrale*, Revue Economique, No. 6, 1999, pp. 1169-1184.

US companies, 8.4 billion ECU (23.6% of total)".[30] Most foreign investments in this area were targeted to the three countries that were included in NATO structures in 1999. Intense flow of foreign capital to the three countries is due to both progress in implementation of market economy mechanisms and equally the additional guarantees of political and military stability. Including a significant number of countries in the list of countries aspiring to NATO would cause an increase in flows of foreign capital in this area, due to additional guarantees provided by this enlargement process.

7.4. Consequences of corruption on financing the defense systems

Due to reducing the threat of an armed conflict since the collapse of socialist block, there is a considerable reduction of the expenditure for defense. The integration of EU countries, the single currency and the costs related to the EU enlargement have led Western governments to maintain budgetary balance, the reduce significantly the military budgets. For example, major EU countries have substantially reduced the share of these expenditures in GDP: UK reported a decrease from 4.1%, as military expenditure in GDP in 1988, to 2.8% in 2004 (in absolute values a decrease from 53,418 million U.S. $ in constant prices (2003) in 1988 to 51,088 million U.S. $ in constant prices (2003) in 2004); France reported a decrease from 3.6% in 1988 to 2.6% in 2004 (a reduction of 2477 million U.S. $ in constant prices (2003) in 2004 compared with 1988)[31]. Moreover, along with the disappearance of the socialist block, the Western countries have switched to a new approach regarding the relationship between the economy and the military sector. The military system is an economic regulator for the European continent, having the role to ensure peace in Western and Central Europe, and its peripheral areas.

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[30] Toubal, L., Toubal, F., *Le capital étranger en Europe centrale et orientale*, Le courrier des pays de l'Est, no. 1013, 2001, pp. 56-65.
[31] Source: SIPRI (http://first.sipri.org/)

The new geopolitical circumstances, the forms of armed intervention and reduction of budgetary allocations have determined important changes of the defense systems. The classical weapons were reduced and compulsory military service was replaced by armies of professionals. The units of rapid intervention aim at prevention or control of regional conflicts. The new military structures must correspond to the types of conflicts that can occur in a given area. Thus, we could identify three types of armed conflicts: those aiming to neutralize or destroy the military ability of an aggressor. It is the situation of Gulf War or Afghanistan War; interethnic conflicts in certain areas; Yugoslavia War; military intervention aimed to prevent the development of the capacity of a potential military aggressor.

Europe does not have an operational military system. Therefore, in crisis situations, it called NATO to solve the conflict situation in that geographical area. It should be noted that countries in Western Europe are neutral from military point of view (Austria, Ireland, Sweden) and other oppose to the militarization of the EU and the creation of a common European defense system. Moreover, the gaps of the European defense system are not based on financial or technological factors, but primarily on political and institutional factors. Thus for the European continent, NATO remains the only political-military organization operating in Europe. Moreover, the Central and Eastern European countries wish to join NATO. Progressive extension of NATO towards east and its interventions outside the area put in a new light the Atlantic community[32]". Crisis in the former Yugoslavia demonstrated the need of a body of army and political institutions appropriate to react quickly in order to mediate regional crises.

"Lacking states in position to act as regulator, it is no longer possible to claim that international anarchy could be controlled by a simple coalition of states aimed also at preventing international

[32] Patrice Buffotot, *La défense en Europe - édition*, 1998, Paris, p.9.

conflicts"[33] . In new situations, the powerful states refuse to meet the classic defense role of a military and economic order. The peripheral states are holding weapons of mass destruction. It is therefore recommended to set up a system of collective security, based on a network of military and civil institutions. In the military field, S. Gupta[34] shows that "in companies perceived to have high levels of corruption, military expenditures have a high share in gross domestic product." The study shows that an increase by 1% of the corruption index is accompanied by an increase of military expenditure in GDP by almost 0.32%.

In the following three charts the distribution of countries in three hypostases is presented. In each case, the corruption index is used as a causal variable. Results from this empirical analysis should be interpreted with caution. Thus we present the following recommendations: data on military expenditures from different sources are relatively different; the corruption index is calculated for civil activities in a civil economy and military transactions often do not have a public character, etc. However, the analysis of data series of the following three situations provides important information for characterizing the size of corruption and its implications on funding the defense systems in each country. Moreover, the coefficient of linear correlation for the series of corruption indices from different years shows a pronounced dependence. For example, the value of this indicator for 2001 and 1998 is 0.97.

In the first case, we consider the dependence of the index of corruption on the share of military expenditure in gross national product (GNP). For the two variables, the value of coefficient of the linear correlation is equal to -0.12. This value indicates a lower level of military expenditure share in GDP for countries where the level of corruption is lower. However, the linear regression model

[33] L'Europe en bref- Paix et sécurité, Centre Européen de la Culture, 1977, p. 3.
[34] Gupta, S., Luiz de Mello, Sharan, R., *Corruption and military spending*, European Journal of Political Economy, Vol. 17, 2001, pp. 749-777.

defined for the two variables does not indicate a significant linear dependence, as shown in Figure 8.

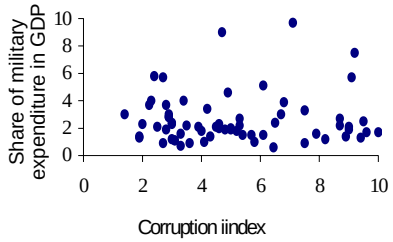

Fig. 8. *Distribution of countries in relation to corruption index and share of military expenditure in GDP*

In the second case we analyse the relationship between corruption index and share of military expenditure in total government expenditure in a country. In this case, the value of coefficient of linear correlation calculated for the two variables is -0.31. This figure shows that military budgets as share in government expenditure, are more consistent in countries where corruption is higher. The high level of the coefficient of linear correlation is -0.29, between the corruption level in 2000 and military budgets as share in government expenditure in 1997. These empirical results reveal a negative dependency between the two variables: the level of corruption is higher (the values of the indicator are closer to 1, the share of military budgets in government expenditure is more significant).

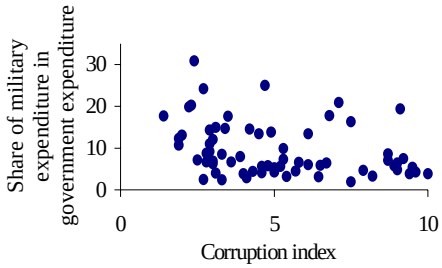

Fig. 9. *Distribution of countries in relation to corruption index and military expenditure in government expenditure*

The linear regression model defined for the two variables is represented by:

$$mege_i = \underset{(1.72)}{13.73} - \underset{(-0.31)}{0.824} \cdot ci \qquad F = 7.24 \qquad [11]$$

The value of student statistics for the parameter corresponding to variable IC equals -2.9, highlighting a significant linear dependence between the two variables. Moreover, an increase of corruption indicates an oversized share of military expenditure in total government expenditure. Concretely, for an increase of corruption by one unit, military expenditure in total government expenditure increases by 0.82%. This increase is, in most cases, not equivalent to raising the standards of the defense systems, but to a preferential use of public funds.

In the third case, we analyse the linear relationship between corruption index (IC) and the share of armament import in GDP (IAGDP). The value of the coefficient of linear correlation, calculated for these two variables, equals -0.20, showing that the import of armament has a higher share in GDP, in countries where the corruption level is higher. For the two variables, we define the linear regression model:

$$iagdp_i = \underset{(0.489)}{1.72} - \underset{(0.087)}{0.14^{*}} \cdot ci_i \quad F = 2.60^{**} \qquad [12]$$

$$*\alpha = 11\%; **\alpha = 11\%.$$

An increase in corruption by one unit favours increasing the share of armament import in GDP by 0.14%. Corruption in the armament trade is difficult to be controlled by civil society in countries with high corruption level, as corruption acts are classified.

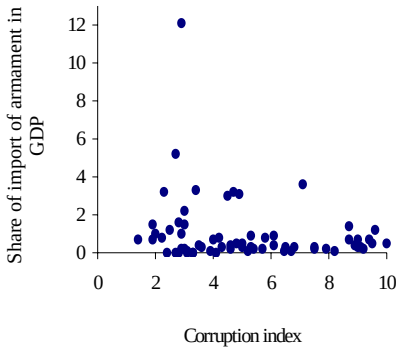

Fig. 10. *Distribution in relation to the corruption index and the share of import of armament in GDP*

The high level of corruption is materialized through economic losses, resulting mainly from the following: i) reducing ratios of economic growth due to inefficient use of public funds. The econometric studies conducted for groups of countries in different regions show that "investments and corruption are negatively correlated"[35]; ii) reducing budgetary revenues in each country due to downsizing the activity in economy and development of underground economy; iii) inefficient use of public funds in financing public services etc[36].

[35] P., Mauro, *Corruptions and growth*, op. cit. R. 696. S.-J. Wei, *Corruption in Economic Development: Grease or Sand?*, op. cit., p. 104.
[36] Klitgaard, R., *Tropical Gangsters*, Basic Books, New York, 1990.

7.5. Conclusions

In the current European and international economic and political conditions, the accession is not only a matter of military strategy, but also an economic one. Political, economic and military stability in the area contributes directly to economic growth of a country by attracting foreign capital into that area and stimulating the development of domestic capital. The accession to NATO propagates a series of neighborhood effects, beneficial on economic and social level, such as:

- Stability support for membership in the EU structures and encouraging investments in that area. Cumulative foreign investments during 1989-2000 per capita, in dollars, are as follows: 1935 in Hungary, 2102 in the Czech Republic, 751 in Poland, 161 in Albania, 407 in Bulgaria, 303 in Romania, 768 in Slovenia, 669 1337 in Estonia, 1027 in Latvia, 642 in Lithuania.
- New technology for military logistics. Neighborhood effects in the economy induced by the economic units.
- Moral support and psychological effects for the population of this area. Accession to NATO is viewed in most favorable terms by inhabitants.

Integration in NATO structures involves high costs on short-term, to adapt to the modern military defense systems, and in a historical perspective, the integration process is certainly a gain due to the neighborhood effects. Equally, for Western Europe, the integration process is benefic in the definition of a stable economic area, responding to the demands of globalization and liberalization of the modern economy.

On the background of worsening internal problems, the only way to rebuild a country devastated by war consists in international aid and an economic plan supported by the economic powers. Solving problems arising in Balkans, taking into account the problems related to transition and instability in the area of Former Yugoslavia, is possible only through a global approach based on three dominant axes: political, economic and military.

For Eastern European countries, accepting the status of neutrality represents a risky and cost - based solution on long term. Arguments: the countries in this area are a buffer between the two great economic powers, Germany and Russia; the nationalist forces represent a disturbing factor, using the precarious economic situation as means to develop nationalist ideas; on economic level, military neutrality in a traditionally volatile area will be a negative signal to foreign financial environments to encourage investments and to gain access to foreign financing.

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Chapter 8

"Globalisation of Corruption" and Development of the Binom "Corruption-Public Integrity" in the Context of Romania Integration into the European Union

8.1. General aspects

In the context of globalisation, the issue of corruption acquires specificity, deriving, on one hand from the diversification of the modalities to corrupt or to be corrupted and on the other hand, from multiplication of the means to fight against this phenomenon. The binom corruption-public integrity becomes a motto of the speeches held by politicians and generally those invested with leadership functions by the society.

It is unanimously recognised the fact that a relevant indicator of an ethical leadership refers to the level and social perception of corruption. Speaking about "the devastating effect of globalisation on the developing countries and especially on poor populations", J. Stiglitz (2002) allocates large spaces to corruption, referring to "the cases of foreign investments", "capitalism based on favouritisms and mafia-typed connection" or "privatisation". Including integration into the European Union as a form for

expressing globalisation in the European area, it is worth to analyse some consequences of this process on the evolution of the binom corruption-public integrity.

When we speak about "globalisation of corruption" we refer to some conclusions emphasized by the specialized literature and studies.

Without trying to make a hierarchy of those conclusions, we shall refer first of all, to its multiple facets that by chance or not, are overlapping the modalities for expressing globalisation on economic, cultural, political level and as well as on the public sector reform. If we analyse an outstanding paper about corruption of Rose-Ackerman, S. (1999), we shall find out that three from the four basic chapters focus on approaching corruption as an "economic [1], cultural [2] or political [3] problem".

8.2. Globalisation and corruption in the public sector

In that paper, situating corruption in the public – private interface, the sub themes aim specific topics for the public sector, of which it is worth to mention the following: corruption at top civil servants level, public programmes reform, civil service reform, pressure on public administration etc. At the same time, it is worth to emphasize the endemic characteristics of corruption in various regions as well as the relations between democracy and corruption with its various modalities of expression, i.e. buying the votes and political influence or even control by political power.

In the above briefly described context, the public sector reform, or better said the public management reform becomes an issue on the working agenda of governmental authorities. We find these preoccupations both in the developed and developing countries. For the first category, an eloquent image about those preoccupations is provided by the reports and studies achieved by OECD Public Management Service, published in the paper: "Governance in Transition: Public Management Reforms in OECD countries" (1995). "A performance-oriented and consequently

customer-oriented public administration represents the key focus of any strategy of reform." [4]

It is obvious that implementation of this principle gets characteristics of globalisation, being undertaken also in the strategies of reform for the public sectors in the developing countries. Another perspective, interesting for the proposed study is provided by E.J. Stiglitz's paper, (2002), stating about "the devastating effort of globalisation on the developing countries, and especially on the poor populations" [5], awarding, in context, large spaces to corruption phenomena, referring to "cases of foreign investments" [6], "capitalism based on favouritisms and mafia-type connections" [7] or "privatisation" [8].

Based on the analysis concerning the relations between market, state and social opportunity, Sen, A. (2000) presents "the social services provision and incentives" [9], emphasising a series of possible distortions due to information asymmetry, i.e. "the administrative costs, immense losses and corruption" [10]. The phenomenon, described as "power asymmetry, by which the 'bureaucrat monarchs' have the power to grant benefits for which the beneficiaries are disposed to pay" will lead, consequently to "a greater possibility of corruption" [11].

The author presents a more profound approach concerning the ethical values, policy-making, for the latest asserting the following:

- "justice is a central concept in identifying the objectives of a public policy and decision about the adequate instruments in order to achieve the targets;

- all public policies depend on how individuals and groups behave in society. Those behaviours are influenced by understanding and interpreting the needs of social ethics" [12].

The perspective of social ethics and the relation with corruption in the public sector provide to Sen the opportunity to extend the analysis on the causes and consequences of corruption. "Dominance of corruption", as defined by the author is really seen as one of the greatest obstacles for the economic progress. The high corruption level could provide negative effects on public policies effectiveness" [13]. Specific for the public sector, a series of attitudes are identified,

by which some legislative regimes encourage corruption, providing discretionary power to the civil servant, who may award favours, representing a large amount of money.

At the same time, as asserted also by Campante, R.F., Chor, D., Do, Quoc-Anh, the temptation to be corrupt is more powerful when the civil servants hold great power. In fact, the above-mentioned authors achieve their analysis within a framework taking into consideration political stability and corruption, emphasising two effects [14]:

- *the time horizon effect*, namely greater instability leads to higher corruption for those holding the power, taking advantage of this short opportunity;
- *the demand effect*, namely the private sector is more eager to bribe the politicians who are politically more stable.

Coming back to Sen, A (2000) paper, he associates to the civil servants holding the power the material situation, relatively modest, leading to increase of corruption temptation.

"It happens at inferior levels of administration, explaining why corruption infiltrates at the basis of the democratic system, involving both middle civil servants and those on superior levels" [15]. Prevention and fight against corruption become up to date. The direct motivation of corruption is to have a certain profit, thus its eradication becomes very difficult. The specialised literature emphasises the possible partial efficiency of the organisational reforms and systems for inspection and sanctions for cutting off corruption. Their coverage area is relatively limited. It is worth to reiterate the example described by the Indian political analyst from the 4th century B.C, Kantilya, who made the difference between forty different ways in which a civil servant may be tempted to become corrupt from the financial point of view and he described how a cash payment system, followed by sanctions and rewards can prevent those activities [16].

These arguments together with other assertions lead to supporting the opportunities to promote national or supranational strategies for the fight against corruption, or better said for ensuring public integrity.

8.3. Political determinations of corruption in Central and Eastern European countries, corruption profile

Continuing the above-mentioned analyses, we can reveal an important conclusion, namely political determination of corruption phenomenon.

To the arguments derived from specialised literature, we may add those from analyses and reports of important forums or international organisations, such as the World Bank (WB) or Transparency International (TI). The latest asserts an important conclusion: the areas and institutions most affected by corruption remain the political parties (4.0), parliaments (3.7), police (3.6) or judiciary (3.5) [17].

Without trying to ignore the details, the situation could be interpreted as worrying, because, at least during the last years, the main actors perceived to be most corrupted remain the political parties and parliaments. Table 1 presents the evolution of the sectors and institutions perceived to be most corrupted.

A comparison between the world level and that of South - Eastern European countries reveals the exceeding of the indicators for quasi majority of the sectors or institutions, varying between 0.2 for media, reaching 1.0 for the medical services, 0.8 for education services or registry and permit. Romania, as country in South - East Europe records, for 2006, lower values than the regional average, excepting the political parties, where it exceeds the regional level by 0.1. Unfortunately, the above situation is associated to a negative appreciation about the effects of the governmental authorities' actions concerning the fight against corruption.

Thus, as it results from TI reports, [18] at South - East Europe level, only 27% of the population appreciate those actions as effective or very effective and an important part of the population (9%) consider that those actions even encourage corruption. In Romania case, the perception about the effectiveness of the actions under discussion reveals even a lower percentage

(16%) of those appreciating as "effective" those actions, 11% considering that those actions even encourage corruption.

Transparency International Romania has achieved analyses and comments concerning the current situation in Romania, showing the following:

- The Government's efforts in the fight against corruption are perceived as less effective by 39% of the public. The appreciations are similar also for Bulgaria, while in Turkey, only 25% of the respondents say that the fight against corruption is ineffective and 29% appreciate it as effective.

- Romania is doing better than the European Union, taking into consideration the perception, where 42% represents the average of negative perception related to the effectiveness of EU Member States Governments actions. Those results may be explained in this way: in the context of the pressures of accession into the European Union on 1 January 2007, in Romania, great efforts were done in the fight against corruption; its results, although insufficient were intensely promoted to population by officials.

- Within the framework of the anticorruption measures, Romania ratified United Nations Convention against Corruption [19] and on legislative level, there were fulfilled the obligations provided by the Convention concerning the protection of integrity alarm signals [20] and conduct codes for the civil servants [21]. However, TI Romania states: "the implementation of those measures remains in deficit as long as the law on protection of integrity alarm signals is still opaque for most of the employees in the public sector and the case law for sanctioning the civil servants is quasi lacking."

Coming back to the worldwide considerations, we shall reveal some conclusions from TI report for 2006, formulated under the header: "corruption is a worldwide problem" [22]. The arguments, although they are not new, are based on the social perception that corruption is a major problem, and at the public authorities level it is expressed by abuse of office for private gains. The practice of bribe influences the poor countries, no matter its

forms of expression. The funds embezzlement diminishes the real allowances for public services, health or education. Government actions to stop corruption have been judged as lacklustre and ineffective. In all countries analysed by TI, the corruption phenomenon greatly affects people lives. And above all, TI report emphasises the fact that political parties are involved in corruption equation.

8.3.1. Evaluating the social perception of corruption

The evaluation of the social perception on the level and coverage area of corruption phenomenon has marked in the last decade and a half, major preoccupations on behalf of international institutions, already above-mentioned.

We refer to the World Bank (WB) and Transparency International (TI). By its effects, corruption is not only a problem of public funds embezzlement or obtaining gains by the representatives of the political power; it has more serious consequences within the governance process and good administration on social, economic level.

Below, we shall focus on the evolution of corruption in some South and Eastern European countries, on one hand, and achievement of a comparative situation with the evolution of the corruption phenomenon in the EU Member States, on the other hand. For Romania, country that recently acceded into the European Union, situated in South - East Europe, this analysis creates the premises to determine more realistic measures, aimed to inscribe our country on an ascending evolution concerning the corruption phenomenon.

A. Romania and South - Eastern European countries

Concerning TI index on evolution of corruption for South - Eastern European countries, Table 2 presents the current situation. Chart 1 presents a more suggestive image on the evolution of this phenomenon. Some relevant conclusions for Romania, in the context of South - Eastern European countries derive from the

descending trend of corruption, since 2003, on one hand, and from comparison with the average of TI corruption indices for the mentioned countries, on the other hand.

The second perspective leads to the following conclusions:

- Variance as statistical characteristic for the level of corruption, measured by TI perception indices is 0.031 for Romania and 0.010 for the average of the South - Eastern European countries, revealing a more increased rhythm for cutting off corruption in Romania related to the average of the other mentioned countries.

- Calculating Pearson correlation coefficient, we shall find out for Romania a very good correlation with the average of the South - Eastern European countries (0.917), Serbia (0.903), Greece (0.860) or Macedonia (0.834). With Turkey, the correlation coefficient is lower (0.663), with Bulgaria (0.253) and Albania (0.181) is extremely reduced, even closer to lack of a correlation connection from statistical point of view. The correlation is negative with Croatia (-0.837).

Trying a similar analysis, using KKM index from the available data [23], we obtain the data in Table 3 for South - Eastern European countries. Chart 2 presents a more suggestive image on the evolution of this phenomenon. Table 3 and Chart 2 reveal the consistence of the two methods for evaluating the social perception of corruption.

From the prospect of the analysis for Romania, we find out that 2002 marked the starting moment for a corruption cutting off process. At the same time, we find out that the corruption level in Romania is higher than the average of South - Eastern European countries. Proceeding to a more detailed statistical analysis, we shall rediscover the conclusions previously exposed, when the analysis was achieved using TI index.

Using the input data of KKM indices, we reiterate the following conclusions:

- Statistical variance is 0.013 for Romania and 0.006 for the average of the South - Eastern European countries, revealing a

more accelerated rhythm for cutting off corruption, related to the average of the mentioned countries.

- This time, Pearson correlation coefficients for Romania are positive only with Turkey (0.585) and Serbia (0.575), being negative with Greece (-0.973), Macedonia (-0.632) and with the other countries, the coefficient is almost zero, showing practically the lack of a correlation. The correlation with the average of the South - Eastern European countries is also reduced (0.259).

B. Romania and European Union countries

Both the period before accession and the recent accession of Romania into the European Union offer the opportunity for an integrated comparative analysis concerning the evolution of corruption in Romania in the context of the evolution of this phenomenon in European Union countries.

Using the available data on http://transparency.org.ro, for the period 2001 – 2006, we obtain an evolution for social perception of corruption, as presented in Chart 3.

Obviously, for Romania and the other European countries, the comparison only in regard with corruption level leads to the conclusion that the level of corruption perception is highest. In other order of ideas, we find out that since 2002, the trend for cutting off corruption is ascending, as the average of the corruption indicators for the EU countries.

At the same time, proceeding to a more detailed statistical analysis, we find out the following:

- The decreasing trend of corruption for Romania varies faster on a growing scale than EU average, as variance for Romania is 0.031 and only 0.014 for EU average.

- Pearson correlation coefficient is very high in the comparison between Romania and France (0.958), Czech Republic (0.949), Slovak Republic (0.896), Austria (0.890), Estonia (0.843), Germany (0.810), as well as EU average (0.906). Negative correlations for Romania are described by Pearson correlation coefficient, related to the Netherlands (-0.879), Luxembourg (-0.771), Spain (-0.619), Poland (-0.601), Italy (-0.591), Finland

(-0.521), as well as Sweden (-0.209), United Kingdom (-0.103). Related to Lithuania, the model does not capture any correlation connection (0.0).

- Pearson correlation coefficient is very high in the comparison between Romania and France (0.958), Czech Republic (0.949), Slovak Republic (0.896), Austria (0.890), Estonia (0.843) as well as EU average (0.906). Negative correlations for Romania are described by Pearson coefficient related to the Netherlands (-0.879), Luxembourg (-0.771), Spain (-0.619), Poland (-0.601), Italy (-0.591), Finland (-0.521), Sweden (-0.209), United Kingdom (-0.103). Related to Lithuania, the model does not capture any correlation connection (0.0).

Similar with the method used for comparative analysis in view of KKM index for all South - Eastern European countries, we shall attempt a similar analysis for all EU countries (Chart 4).

This time, the comparison between the average of EU countries (MEAN UE) and Romania reveals the following conclusions:

- At EU level, KKM index signalises a growing trend for corruption since 2003, unlike Romania, where the same index indicates a slight decreasing trend for corruption.

- We may argument the above conclusion also by calculating Pearson correlation coefficients and making their comparison. Thus, the respective coefficient indicates a negative correlation with EU average (-0.334) and at higher levels with Greece (-0.973), Italy (-0.808), Sweden (-0.605), Netherlands (-0.485), United Kingdom (-0.483) etc. Positive correlations are indicated only with Slovenia (0.408), Malta (0.475), Germany (0.227), Belgium (0.209), Austria (0.103).

In our opinion, additional to those presented, other two conclusions are important for a more profound analysis.

Thus, when comparing those two indices, different results occur significantly. Therefore, the first idea that could be operational relates to some aggregated corruption indices that cumulate the results regarding social perception. Such index will be presented, with experimental title even in this study. On the

other hand, we consider that in this complex mechanism for evaluating corruption, in the comparative analyses with EU countries a *dual effect* occurs between the real evolution of corruption and social perception in this regard. This effect originates from the stages of EU construction, precisely the periods previous to EU enlargement (we refer to enlargements from 2005 and 2007). On one hand, in older EU countries it is hard to believe that the corruption level has increased and on the other hand, in fact only the social perception has increased, due to social concerns about the effects of integrating new states, where this phenomenon registered more powerful levels and coverage areas. Thus a gap occurs between the real level of corruption and the social perception in this regard. It is obvious in the growing trend of corruption perception for many of older EU Member States. The situation is different for the countries that acceded recently, where the trend of corruption is decreasing both as perception and real situation, due to insistent anti corruption measures. We shall come back to this analysis when referring to the proposal about an aggregated model for corruption analysis based on KKM and TI indices.

8.4. Decentralization and corruption

The decentralization process represents a direct effect of globalisation in the public sector. Several specialised papers and studies have already approached the connection between decentralization and corruption. Without ignoring Rose-Ackerman's contributions and other outstanding contributions, the core ideas of our brief analysis take into consideration a recent study presented in The Policy Research Working Paper Series, by Anwar Shah (2006) [24]. For Romania, Andrei, T. (2007) achieved a relevant study [25].

In Romania, public administration reform in the area of decentralization and devolution includes three major elements: continuing decentralization by transfer of competences and administrative and financial responsibilities from central to local

public administration authorities; continuing the devolution process by delegation of responsibilities in the territory, depending on the needs on local level, within the same administrative structure (the devolved services are subordinated to the ministry that delegated the responsibility); transforming the devolved services in territory, depending on citizens' needs into decentralised services under local authorities' responsibility. It is unanimously recognised the fact that the decentralization process and corruption could determine significant negative effects on economic and social level, on medium and long term.

Andrei, T. (2007) achieves a study aimed to determine some characteristics of corruption in local public administration. The research was achieved on a representative sample of mayors of Romanian localities during November – December 2005.

In order to create the sample, a cluster-type technique was used, the volume of the sample representing 9% from the total population of mayors. All mayors from seven counties were interviewed, the counties were randomly extracted. The error for estimating the parameters at the reference population level is plus/minus 1.2%.

The questionnaire comprised questions on measuring the mayors' opinion about actual issues concerning public administration reform, namely: civil service management, civil servants' in-service training, local public administration reform by continuing the decentralization process, ensuring the training of elected officials on topics specific for local public administration, corruption, changes in the technical body from administration under the pressure of the political factor, quality of communication in the reform process etc. We shall use the database from the prospect of analysing the characteristics of corruption phenomenon in local public administration and identifying some characteristics of the decentralization process. A logistic model will be defined for corruption analysis. The analysis on the database aims to identify the mayors' position related to corruption in local public administration, thus estimating the amplitude and causes.

Within the framework of the study, based on the data recorded for the sample, the corruption phenomenon is signalled especially by the mayors that consider citizens to be directly involved in relevant decision-making on community level. Thus, Pearson correlation coefficient between the two variables is 0.315, significant for a threshold of 1%. This characteristic emphasises a direct cause for occurrence and maintaining of corruption phenomenon, namely lack of transparency in decision-making in public institutions from local public administration.

In the context of decentralization, the study states: ”corruption together with other factors contributes directly to low quality for service provision by a local public administration. The study defines the derivate variable: “Extent to which local public administration achieves its core functions” (Q5), as average of four variables, defining core functions: a) administrating and managing the public goods and funds at local level (Q1); b) ensuring basic services at local level (health, social security, education, culture, military etc.) (Q2); c) prognosis and economic-social development (Q3); and d) organisation (Q4). In order to quantify the mayors’ opinion related to the extent in which local public administration achieves its core functions, a scale of ordinal measure was defined with the following items: 1- very low extent, 2- low extent, 3- great extent, 4- very great extent. Table 4 presents the characteristics of the four primary variables and derivate variable.

In the current study about decentralization, the mayors’ vision is that local public administrations can fulfil their core functions only on a low extent; the less favourable situation is the low capacity of prognosis and economic-social development at local level, and ensuring basic public services. The low capacity of local administrations in basic service provision is determined directly by inadequate administration and management of public goods and funds at local level (Pearson coefficient is 0.549) and low organisational capacity (0.563).

8.5. Public Integrity Systems

As known, the country studies entitled *National Integrity System*, achieved by Transparency International are reports of analysis, presenting a detailed evaluation of the national systems for the fight against corruption.

At the same time, in Transparency International (TI) conception, the National Integrity Systems (NIS) comprise "key institutions, laws and practices (the 'pillars") that contribute to integrity, transparency and accountability in a society. " [26]

The perspectives of the analysis and modelling the corruption phenomena are supported by the country studies that provide both an overview on NIS, the indicators for measuring the subsequent progresses from those countries, as well as a basis of comparisons among states.

The above-mentioned country study asserts: "when it functions correctly, NIS fights against corruption as part of a broader fight against the abuse of power, law infringement and fraud under all its forms" [27].

Ideas and studies about public integrity and description in this context of the role of important "pillars" have been also developed by other institutions. For example, The Economic Development Institute of the World Bank, in 1998 approaches the role of Supreme Audit Institutions (SAI) in promoting the responsibility and transparency within the governance process. Concerning public integrity, Dye, M.K. and Stapenhurst, R., (1998) appreciate: "building strong institutions is a central challenge of development and is a key to controlling corruption' [28].

Within the concept developed by the mentioned authors, "the integrity pillars" are as follows [29]:

- political will;
- administrative reforms;
- "watchdog" agencies (Anti-corruption agencies; Ombudsman; Auditor general)
- parliaments;
- public awareness/involvement;

- the judiciary
- the media;
- the private sector.

Previous to this study, we remark Pope, J.'s contributions (1997) [30] on development of the national integrity systems.

8.5.1. Stages in developing the National Integrity System in Romania

The country study on NIS for Romania has been elaborated since 2005. Synthesising the analysis achieved in the study from 2005 in developing the National Integrity System, in Romania, three stages [31] could be revealed up to present:

1990 – 1998

· The period coincides with the first half of the transition period;

· The main exponents of the national public integrity were the Parliament and Government, that did not elaborate a public policy to promote the public integrity;

· The Judiciary had no capacity to adjust the deficiencies of the other two powers in the state;

· The social perception on the public pillars reveals a high degree of corruption, just in the interior of most of the public integrity pillars;

· The civil society was not concerned with corruption, focusing on ensuring the basic requirements of democracy, rule of law and respect for human rights;

· The international institutions were concerned about the economic and democratic reforms.

1999 – 2004

· The second stage coincides with the beginning of the negotiations of accession into the European Union;

· The international agencies have expressed their interest towards the Romanian public integrity system (programmes were initiated and political pressures were exerted for reforms);

- The main pillars of integrity – the Executive and Legislative – have realised the seriousness of the national corruption level;
- In 2001, the Government elaborated a National Anticorruption Strategy and the National Anticorruption Prosecutor's Office was set up;
- Other NIS pillars were strengthened, such as Ombudsman or Court of Audit.
- The progresses have determined Romania to become NATO member and closing the negotiations for accession into the European Union;
- The other pillars: Parliament, justice, police have not recorded progresses;
- The civil society was focused on the fight against corruption, adding on the public agenda law drafts, essential for public integrity;
- The public policies designed to ensure the cooperation between pillars were inconsistent, proving a low capacity of implementation and reduced political will.

2005 – present

- The third period coincides with signing the Treaty of Romania Accession into the European Union;
- The main political criteria were fulfilled;
- Romania should implement effectively EU standards in the area of justice concerning corruption level, competition and control in customs.

8.5.2. Social perception of NIS pillars

After Romania accession into the European Union, the National Integrity System has created significantly its own mechanisms of interaction, designed to lead to a better accomplishment of its mission. The research concerning social perception on the efficiency level of NIS pillars was achieved during January – February 2007, on a sample comprising 700 employees from the public sector, based on some characteristics of

civil servants: age, sex, length in service, current job, level of civil service position. From the respondents, 34% worked in central administration and the rest in local administration, of which 26.1% in city halls and 14.1% in county and local councils. Judging the results obtained, on average, by each variable associated to the integrity pillars, the research reveals important issues (Table 5).

Chart 5 presents the variance of social perception on a scale from 1 to 4.

The perspective of a coherent action in the fight against corruption derives from research, using a statistical analysis of Pearson correlation coefficient. Thus, between NIS pillars there are different degrees of correlation, as follows: the most powerful correlation is between Parliament and Government (0.762) or Judiciary System (0.708). A medium correlation exists between Parliament and Control Institutions (0.629) or Ombudsman (0.603) and a lower correlation between the same Parliament and Court of Audit (0.458), Political System (0.485), Media (0.456), Civil society (0.474) or International Organisations (0.493).

8.6. Conclusions

The aspects presented in this study represent a brief synthesis about corruption in the context of economic, social and political development of Romania. The globalisation processes with direct consequences also on the public sector determine a high degree of generality for various forms of corruption, on one hand and impose generalization of mechanisms and means for the fight against corruption, on the other hand. The National Integrity System represents such a mechanism, of great complexity that becomes operational since Romania accession into the European Union. The analysis on the corruption phenomenon within the framework provided by NIS creates the premises of an overwhelming action by all actors. Only after few years since application of this mechanism, the social perception is not very high. This fact is revealed also by the sociological research, presented in this study. The analysis on the statistical correlation

determines new directions for NIS development as well as the necessity to create more effective coordination mechanisms. Concerning the social perception of corruption, we come back to an important finding of the current study. It regards the dual effect induced in the social awareness, where in a first perspective in the older EU countries it occurs the perception of increased corruption, and in other perspective in the recent EU countries, perception is contrary, even not supported by reality. It is worth to pay attention to this effect, for a series of further studies, as well as to conceiving and making operational some aggregated indicators of corruption perception, leading to compatible results, closer to reality.

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Table 1

Evolution of the corruption level during 2004 – 2006

Sector/institution	2004	2005	2006
1	2	3	4
Political parties	4.0	4.0	4.0
Parliament/ Legislature	3.7	3.7	3.7
Police	3.6	3.6	3.5
Judiciary System	3.6	3.5	3.5
Tax revenue	3.4	3.4	3.3
Business/ private sector	3.4	3.4	3.6
Customs	3.3	3.3	-
Media	3.3	3.2	3.3
Medical services	3.3	3.2	3.1
Education system	3.1	3.0	3.0
Registry and permit	3.0	2.9	2.9
Public services	3.0	3.0	3.0
The military	2.9	2.9	3.0
NGOs	2.8	2.8	2.9
Religious bodies	2.7	2.6	2.8

Source: TI, "Global Corruption Barometer", 2004, 2005, 2006

Table 2

Evolution of corruption (TI) in South-Eastern European countries

Country	Year					
	2001	2002	2003	2004	2005	2006
Albania	-	2.5	2.5	2.5	2.4	2.6
Bulgaria	3.9	4.0	3.9	4.1	4.0	4.0
Croatia	3.9	3.8	3.7	3.5	3.4	3.4
Greece	4.2	4.2	4.3	4.3	4.3	4.4
Macedonia	-	-	2.3	2.7	2.7	2.7
Romania	2.8	2.6	2.8	2.9	3.0	3.1
Serbia	-	-	2.3	2.7	2.8	3.0
Turkey	3.6	3.2	3.1	3.2	3.5	3.8
Average	3.19	3.11	3.11	3.24	3.26	3.38

Source: http://www.transparency.org

Table 3

Evolution of corruption (KKM) in South - Eastern European countries

Country	1996	1998	2000	2002	2003	2004	2005
Albania	0.07	0.99	-0.68	-0.86	-0.71	-0.81	-0.76
Bulgaria	- 0.71	-0.56	- 0.20	- 0.19	- 0.09	- 0.03	- 0.05
Croatia	- 0.51	- 0.39	- 0.03	0.23	0.03	0.06	0.07
Greece	0.42	0.78	0.84	0.57	0.57	0.53	0.40
Macedonia	- 1.06	- 0.36	- 0.52	- 0.75	- 0.73	- 0.56	- 0.50
Romania	- 0.18	- 0.44	- 0.50	- 0.35	- 0.29	- 0.29	- 0.23
Serbia	- 0.98	- 1.03	- 1.13	- 0.77	- 0.55	- 0.55	- 0.55
Turkey	0.10	- 0.07	- 0.36	- 0.45	- 0.27	- 0.25	0.08
Average	- 0.36	- 0.14	- 0.32	- 0.32	- 0.26	- 0.24	- 0.19

Source: http://info.worldbank.org/governance/kkz 2005 /sc_country.asp

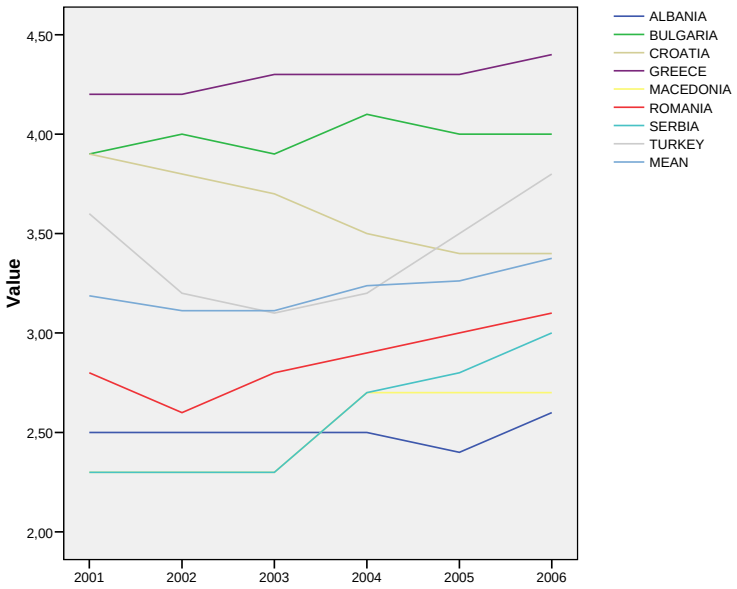

Chart 1. *Evolution of TI corruption perception index in South – East Europe*

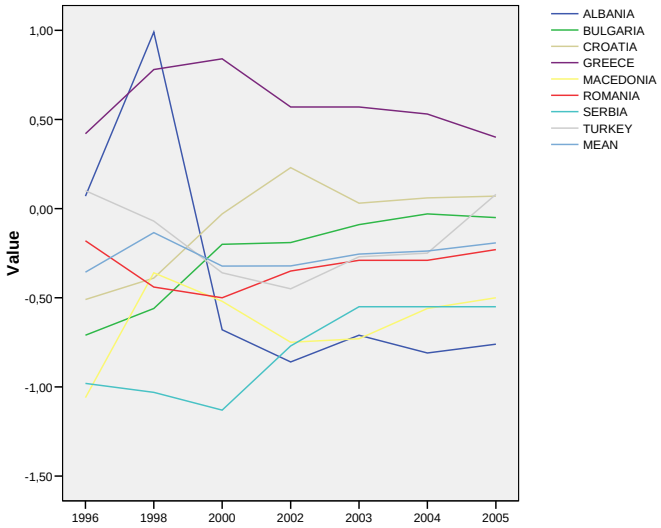

Chart 2. *Evolution of KKM corruption perception index in South - Eastern European countries*

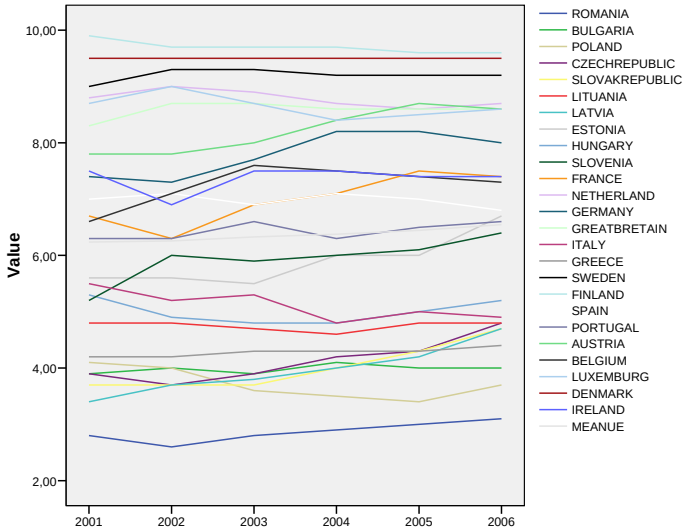

Chart 3. *Evolution of IT corruption index for EU countries*

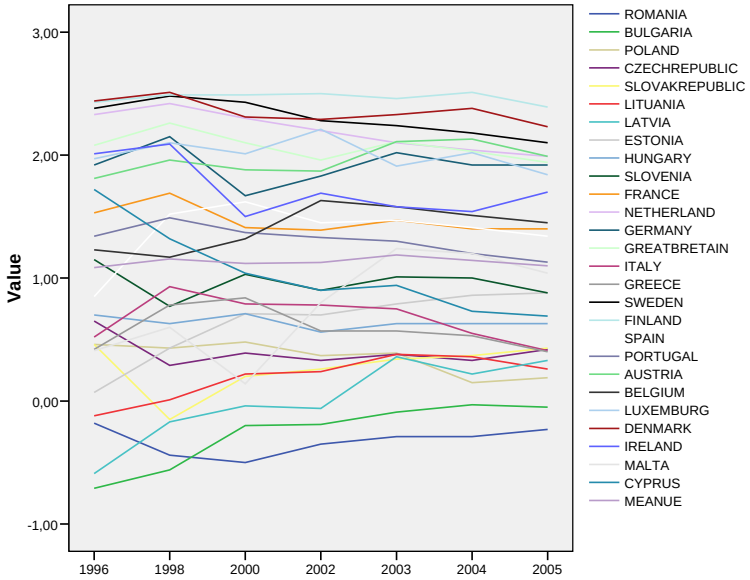

Chart 4. *Evolution of KKM corruption index for EU countries*

Table 4

Characteristics of the variables Q1… Q5

Variable	Average	Standard deviation	Matrix for correlating the primary variables			
			Q1	Q2	Q3	Q4
Q1	2.79	0.701	1	0.549*	0.317*	0.521*
Q2	2.38	0.755		1	0.534*	0.563*
Q3	2.27	0.798			1	0.515*
Q4	2.70	0.779				1
Q5	2.53	0.600	-	-	-	-

* significant value for a threshold equal to 1%.

Table 5

Statistic average for social perception on NIS pillars
(using a scale from 1 to 4)

Pillar	Average	Pillar	Average
Parliament	1.621	Government	1.729
Judiciary System	1.925	Audit	2.338
Ombudsman	1.794	Control	2.028
Civil servants	2.369	Political System	2.516
Political System	2.206	Public Procurement	2.014
Media	2.948	Civil Society	2.928
Internationals Organisations	2.864		

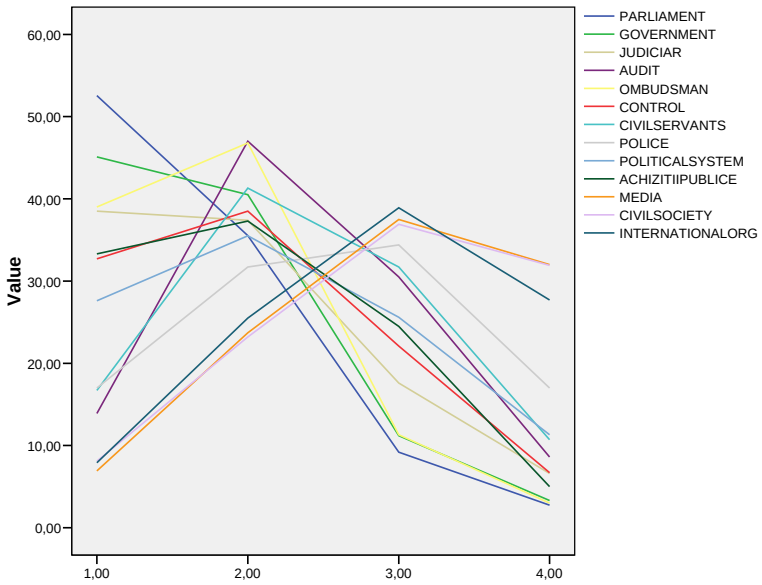

Chart 5. *Evolution of social perception on integrity pillars*

Chapter 9

Public Integrity and Performance of Governance. A Comparative Study for South-Eastern Europe

9.1. The governance performance

9.1.1. A Systemic Framework

The issue of governance performance is more and more present in the field literature. Regarded as a finality of a complex public management process, the governance performance, we refer either to the central, or to the local government, acquires systemic characteristics and, according to their level, the governors establish the feedback that is carried out through new public decisions, meant to lead towards a performance improvement.

The concerns for a systemic modelling of the public management can be met both when the issue of the public administration comes out (Pierre, 1995) and, lately, the public

management reform[1] (Pollitt and Bouckaert, 2000). A brief presentation of some systemic models used in the public management of the local development is also made by Matei (2008). Referring to the performance oriented managerial reforms, Pollitt (1995; 1998) shows that, for the public sector "the organisations must redirect in order to focus more on results. These have to take into account the costs, to measure the outputs, to assess the effects and to use all this information in a systemic process of feedback and continuous improvement".[2]

The most relevant and recent point of view respecting the systemic approach of the public sector performance is presented by Bouckaert and Halligan (2008). Following a logical sequence of building a complex systemic model of the public sector performance, the mentioned authors described micro, meso and macro models, integrated or individual, that can deliver the proper framework for understanding and study thoroughly the specified concept.[3] The result of this measure is a complex system, with mixed architecture that includes more cycles of intermediary feedback and that integrates "four positions on managing performance: Performance Administration, Management of Performance, Performance Management and Performance Governance".[4] In this context, the governance performance can be seen as a subsystem of the public sector performance or, more, of the managerial performance. The specific of the governance performance is also that of being a result of the interaction between public economic systems and that of the public management. Thus, the fundamental concepts as the public intervention, public decision, optimisation, and so on, become adjacent and determinant for the level of the governance performance.

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[1] Pollitt, Ch., Bouckaert, G., (2000), "Public Management Reform: A Comparative Analysis", Oxford University Press, Epigraf Publishing House, p. 39.
[2] Idem, p. 154.
[3] Bouckaert, G., Halligan, J., (2008), "Managing Performance. International Comparisons", Routledge, London and New York, pp. 11-34.
[4] Idem, p. 32.

9.1.2. Present approaches

Bouckaert and Halligan (2008) make an international comparison related to "managing performance". The statistical ratios and/or connections between management the performance, in the context of the public sector, become determinant both for the understanding of the processes of performance management, and for the governance performance.

The general approach framework of this issue is delivered by the New Public Management (Hood, 1995) or by "reinventing government" (Osborne and Gaebler, 1992).

A broad and generic definition of performance – based public management is taking/allocating responsibility for the performance of the system and being accountable for its results.[5]

Hannagan (2008), referring to the performance management in an organisation, states that "the term *performance management* means different practices to different managers but usually includes the following elements:

- The organisation has a shared statement of its objectives, or a mission statement or corporate objectives, which it communicates to its employees;
- Individual performance management targets are set, which are related to the organisational objectives;
- A regular, formal review is carried out to monitor progress toward the objectives;
- The review process is used to identify training needs, career development and possible rewards;
- The effectiveness of the whole process is evaluated against the overall performance of the organisation".[6]

Important and constant concerns this time with regard to the performance of the public sector can be also found in the UN Public Administration Programme[7], which in the 2005 and 2008

[5] Idem, p. 32.
[6] Hannagan, T., (2008), "Management. Concepts & Practices", Prentice Hall, p. 294.
[7] See http://unpan1.un.org/intradoc/groups/public/documents/UN/UNPAN.pdf

reports presents both the public sector performance (WPSR, 2005), and the issue of the public governance (WPSR, 2008). Thus, WPSR (2005) focuses upon the way in which the human potential will be transformed in order to improve the performance of the public sector. The general context in which the stated issue is approached is characterised, on one hand, by the complexity of the policy making processes and of the public strategies and, on the other hand, by the deterioration of the human resources capacities of accomplishing these functions. The aspects set forth render difficult, for many states, the application of the national objectives and strategies for increasing the governance performance through poverty and corruption reduction, promoting the sustainable human development as it is underlined in the Millennium Development Goals (MDGs).[8]

WPRS (2008) emphasizes the role of the civic engagement in the public governance process. By presenting several case studies, it is being emphasised, in a real manner, the role of different practices in consolidating the governance capacity through transparency and responsibility. In this context, the relations between the power and the civil society organisations are tackled, as well as the necessity of adopting methodologies and strategies proper for each state's condition for a successful civic engagement in the public governance.

The mentioned technical support is also offered by the analysis made by Willmore (2005).

9.1.3. The integrity, as a governance principle in the public sector

Along with the UN concerns there are also the ones of the World Bank, who dedicate numerous studies both to the researches regarding the Governance Indices and the Public Sector Governance. The concern of the present study is situated at the meeting point of the two mentioned topics. Worth to be mentioned,

[8] A more detailed presentation of these aspects can be found in the UN Millennium Declaration, http://222.un.org/millenniumgoals/bkgd.shtml

from the point of view of the World Bank, are the governance principles in the public sector, which are referring to:

- Responsibility – according to which the public authority is responsible for the decisions and promotes mechanisms that ensure the application of public management high standards;
- Transparency/ openness – that expresses the public authority capacity regarding the roles and responsibilities assumed, as well as the decision-making procedures and the power exercise;
- Integrity – with reference to the public and personal, impartial, ethical action, and in the interest of the public authority;
- Stewardship – imposing the use of each opportunity for developing the public assets;
- Efficiency – ensuring the best use of resources in order to accomplish the organisation's objectives;
- Leadership – applied through a commitment for good governance.[9]

All these principles lead to a public governance approach that would allow obtaining some superior results, in terms of efficiency and with a high performance.[10]

In the view presented in the above papers, the public sector governance includes: "…the set of responsibilities and practices, policies and procedures, exercised by an agency's executive, to provide strategic direction, ensure objectives are achieved, manage risks and use resources responsibly and with accountability".[11] We used this approach of the concept of public sector governance giving the practical approach manner and turning account of the possible connections with the second part of the study referring to

[9] ANAO, (2003), "Public Sector Governance", Volumes 1&2: Better Practice Guide, Commonwealth of Australia, Canberra, pp.2.

[10] For details and explanations can be seen also Australia Public Service Commission, (2005), "Foundations of Governance in the Australian Public Service", Commonwealth of Australia, Canberra, http://www.apsc.gov.au/ foundations/

[11] ANAO and Department of the Prime Minister and Cabinet, (2006), "Implementation of Programme and Policy Initiatives: Making Implementation Matter, Better Practice Guide, Commonwealth of Australia, Canberra, p. 13, http://www.anao.gov.au/uploads/documents/"

integrity and economic freedom. The State Services Authority (SSA) from Australia addresses the issue in the same manner, accentuating the public integrity among the main pillars of public integrity, assuming the "promotion of high integrity and conduct standards in the public sector".[12] Similar stands took the Association of Chartered Certified Accountants (ACCA), emphasising the fact that "the governance can also cover the behaviour standards, the organisational structures and the processes".[13]

At the same time, OECD states that "good, effective public governance helps to strengthen democracy and human rights, promote economic prosperity and social cohesion, reduce poverty, enhance environmental protection and the sustainable use of natural resources, and deepen confidence in government and public administration".[14] The real issue of public integrity is developed by OECD, in this very moment a global forum is being organised with regard to "building integrity in government".[15]

9.2. The corruption, integrity and economic freedoms

As it was also shown in the 1st chapter of the present study there are several indices of the governance performance. We will keep in mind as indices, as Prohnițchi (2003) does too, the Gross Domestic Product (GDP) per inhabitant, as well as the economic freedom (IEF). The mentioned author reaffirms the conclusions of the World Bank or Transparency International, according to which

[12] "Public Sector Standards Commissioner (PSSC), Ethics framework", http://www.ssa.vie.gov.au/

[13] http://www.accaglobal.com/.../activities/subjects/publicsector/governance/

[14] OECD, (2009), "Public Governance and Management", http://www.oecd.org, p.1.

[15] Details regarding the recent concerns of OECD about promoting governance integrity can be found, for example, in "Building a Clearer World: Tools and Good Practices for Fostering a Culture of Integrity" (2009), Paris, http://www.oecd.publicgovernanceforum.org/, or "OECD Recommendation on Enhancing Integrity in Public Procurement", (2008), http://www.oecd.org/document/...html.

"the poorer the country and the more reduced is the economic freedom, the more corrupt is its bureaucratic and political system".[16] The present study perspective determines us to take into account many organisations' analysis based on the conclusion that the "concern about the negative social and economic impact of corruption has grown rapidly in both emerging and advanced democracies".[17]

The conclusion is also supported by the World Bank who identifies the concept "as the single greatest obstacle to economic and social development. It undermines development by distorting the rule of law and weakening the institutional foundation on which economic growth depends". [18] A similar position is that of the International Monetary Fund, which states that "many of the causes of corruption are economic in nature, and are its consequences – poor governance clearly is detrimental to economic activity and welfare".[19]

The development of theoretical and empirical studies has not always been the cause and effect type, between corruption and economic performance.

Worth mentioning here are the comments made by Rose-Ackerman (2009) with regard to the conclusions expressed by different specialists and analysts of the corruption issue.[20]

Mauro (1995, 1998) demonstrates that the high corruption levels are associated with low investment levels as part of GDP.

The corruption indices are extremely isolated from the bureaucratic efficiency, as for example the level of bureaucracy and judicious quality. As a consequence, Mauro was incapable of

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[16] Prohniţchi, V., (2003), "Contextul economic şi instituţional al corupţiei", Analytic Report, RA/1, TISH Publishing House, p. 31. http://www.transparency.org/

[17] Akai, N., Horinchi,Y., Sakata, M., (2005), "Short-run and Long-run Effects of Corruption on Economic Growth: Evidence from State-Level Cross-Section Data for the United States", CIRJE – F – 348, http://www.e.n-tokyo.ac.jp/cirje/research/

[18] http://www.worldbank.org/

[19] http://www.imf.org/external/pubs/ft/issues6/

[20] Rose-Ackerman, S., (2005), "Corruption and Government. Causes, Consequences and Reform", Cambridge University Press, p. 3.

measuring the marginal effect of each of these measures. By putting together the separated indices in a measure of bureaucratic efficiency (on a scale from one to ten): "if Bangladesh, with a score of 4.7 would have improved the integrity and the bureaucratic efficiency at Uruguay's level, 6.8, its investment rate would increase with approximately five percentage points and the annual growth rate of GDP would increase with almost half of a percentage point" (Mauro, 1998). Also, Mauro proves that the extremely corrupted countries tend to under-invest in human capital, spending less on education. Mauro argues that this fact happens because the education delivers less work opportunities for corruption than other types of capital-intensive public expenditures.

Ades and Di Tella (1997) state that an aggressive industrial policy could be motivated, on a certain extent, by the corrupt gains made available by that policy. In such cases, the positive direct effect of the policy could be submitted by its role in the increase of corruption, thus discouraging the investments. Their empirical results demonstrate that, in presence of corruption, the positive influence of the industrial policy is reduced to a half.

Also, for public integrity we end up choosing the corruption perceptions index (TI) computed by Transparency International in the last decade, for the South-Eastern Europe states[21], as well as the KKM index (control of corruption) computed by the World Bank, for the same sample and period, as aggregated and individual governance index. The two used indices express, in different ways, the perception upon the way in which the public power exercise has an impact upon the private sector profit, including both the narrow and the wide corruption form, as well as "capturing" the states by the elites and the personal interests.

[21] http:/www.transparency.org/

9.2.1. Corruption and governance

One of the fundamental papers presenting the indissoluble link between the corruption and the governance is that of Rose-Ackerman (2005) that eloquently proves how the high level of corruption limits the investment and the economic growth and leads to the government's inefficiency.

For the developing countries, as well as for those being in transition from socialism, the risk is higher. The mentioned author identifies the corruption phenomenon as a complex one of economic[22], cultural[23] and political[24] nature.

Also, a series of classical papers must be mentioned, having as object the identification of causes and mechanisms of corruption transmission inside an economic and social system, from which we mention: Krueger (1974), Rose-Ackerman (1975), Mauro (1995), Tanzi (1998), etc. In the field literature four categories of factors are identified, which directly influence the corruption in a system: historical factors, social and cultural factors and economic factors. In the political and juridical factors category we include the quality of the political system, the features of the juridical system (Leite and Weidmann (1999)), especially the legislation and the institutions specialised in the fight against corruption, the quality of the democratic system, the features of the electoral system in a country, the features of the administrative system, the degree of administrative decentralisation in a country etc. A series of studies, like La Porta (1999) and Treisman (2000) accentuate the influence of the traditions and historical factors upon the level of corruption in a country and the features of the mechanisms of its development and transmission. The social and cultural factors have a special role in accentuating the corruption features in a country (La Porta (1999), Treisman (2000), Alesina (2003)). Equally, the religious factor plays an important part in spreading the corruption on a

[22] See more details in Rose-Ackerman, S., (2005), "Corruption and Government Causes, Consequences and Reform", part I, chapters 1-5, pp. 7-89.
[23] Rose-Ackerman, S., (2005), *op.cit*., part II, chapter 6, pp. 89-111.
[24] Rose-Ackerman, S., (2005), *op.cit*., part III, chapter 7-9, pp. 111-175.

social system level. The economic factors, as well as the openness level of the economy (for example Dreher (2003), Treisman (2000), Wei (2001)), the size of the public sector (Tanzi (1998), Treisman (2000)), the salaries' level in the public sector (van Rijckeghem and Weber (1997)) etc. directly influence the corruption level in a country.

Another important aspect when studying corruption is choosing the most appropriate econometric models for estimating its effects upon some sectors of activities. From the most important research directions that target the estimation of corruption's effects upon the economic and social environment, we mention:

(i) Measuring the corruption effect upon the economic growth (Mauro (1995), Abed and Davoodi (2000), Krueger (1974));

(ii) The corruption's effects upon the development of some sectors of national economies (Tanzi (1998), Wei (2001));

(iii) The effects of the decentralisation process upon the level and the mechanisms of corruption transmission in a system (Shah (2006)) etc.;

(iv) The consequences of corruption upon the financing systems of some activity sectors, like the military one, Gupta (2001), the salaries in the public sectors (van Rijckeghem and Weber (1997)).

For the states in South-Eastern Europe, with special reference to Romania, we remark the papers of Andrei, Matei and Rosca (2008), as well as Andrei, Matei, Stancu and Andrei (2009), approaching the effects of corruption in the public administration systems, education or health, formulating econometric models for evaluating performance in the public sector.

9.2.2. Public Integrity Systems

The first chapter of the study approached the relation between integrity and performance of governance. The National

Integrity Systems (NIS) represent an important instrument for promoting public integrity.[25]

In Transparency International (TI) conception, the National Integrity Systems (NIS) comprise "key institutions, laws and practices (the 'pillars") that contribute to integrity, transparency and accountability in a society. " [26]

The perspectives of the analysis and modelling the corruption phenomena, aimed by our study, are supported by the country studies that provide both an overview on NIS, the indicators for measuring the subsequent progresses from those countries, as well as a basis of comparisons among states.

The above mentioned country study asserts: "when it functions correctly, NIS fights against corruption as part of a broader fight against the abuse of power, breaking the law and fraud under all its forms".

9.2.2.1. Stages in developing the National Integrity System in Romania

1990 – 1998

- The period coincides with the first half of the transition period;

- The main exponents of the national public integrity were the Parliament and Government, that did not elaborate a public policy to promote the public integrity;

- The Judiciary had no capacity to adjust the deficiencies of the other 2 powers in the state;

[25] The broad description of the relations between public integrity and corruption concerning the South-Eastern European states is presented in Matei, A., (2008), "Corruption, Transparency and Quality. Comparative Approaches and Judiciary Support; Themis Project "Transformation of the Role of the Judiciary within a European Integrated Context", Bibliothéque de Droit Public Européen, vol. LXXXV, Esperia Publications Ltd, London, pp. 127-142

[26] "National Integrity System. Country Study. Romania 2005, Transparency International Romania, p. 1.

- The social perception on the public pillars reveals a high degree of corruption, just in the interior of most of the public integrity pillars;
- The civil society was not concerned with corruption, focusing on ensuring the basic requirements of democracy, rule of law and respect for human rights;
- The international institutions were concerned about the economic and democratic reforms.

1999 – 2004

- The second stage coincides with the beginning of the negotiations of accession into the European Union;
- The international agencies have expressed their interest towards the Romanian public integrity system (programmes were initiated and political pressures were exerted for reforms);
- The main pillars of integrity – the Executive and Legislative – have realised the seriousness of the national corruption level;
- In 2001, the Government elaborated a National Anticorruption Strategy and the National Anticorruption Prosecutor's Office was set up;
- Other NIS pillars were strengthened, such as Ombudsman or Court of Audit.
- The progresses have determined Romania to become NATO member and closing the negotiations for accession into the European Union;
- The other pillars: Parliament, justice, police have not recorded progresses;
- The civil society was focused on the fight against corruption, adding on the public agenda draft laws, essential for public integrity;
- The public policies designed to ensure the cooperation between pillars were inconsistent, proving a low capacity of implementation and reduced political will.

2005 – 2007

- The third period coincides with signing the Treaty of Romania Accession into the European Union;
- The main political criteria were fulfilled;
- Romania should implement effectively EU standards in the area of justice concerning corruption level, competition and control in customs.

2007 – present

- Getting thorough knowledge about European standards, instruments and practices about strengthening public integrity as indicator of efficient governance.

The stages undergone by Romania in order to develop its own integrity system are present, with certain features in most states analysed in the actual study.

9.2.3. Integrity Framework

The concerns of various public bodies, institutions and authorities, universities or outstanding specialists have shaped a model for ethics framework in the public sector[27]. Adapting this framework to the general topic of public integrity, we obtain a logical causal relation between integrity and performance of governance.

[27] See "State Services Authority: Supporting Government Serving Victorians – Ethics Framework",
http://www.ssa.vic.gov.au/.../Ethics Framework

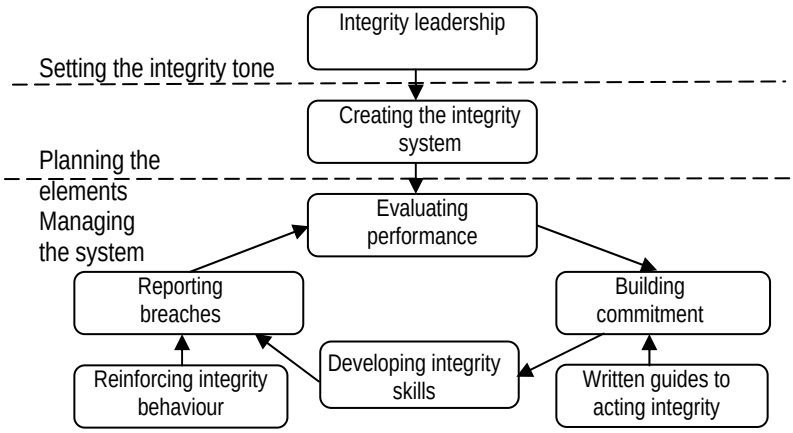

Fig. 1. *Integrity Framework*

The Integrity Framework comprises in fact three subsystems concerning: integrity leadership, creating the integrity system and managing the integrity system. We add the integrity resource kit, referring to take the integrity challenge, to develop integrity skills and implement the kit.

9.2.4. Economic freedom

According to the assertions of Heritage Foundation, the economic freedom represents the individual's right to control his/her work and property. In an economically free society, the individuals have the freedom to work, produce, consume and invest in any way, being protected and not constrained by the state. In order to determine the global indicator of economic freedom (IEF), Heritage Foundation uses ten specific indicators, evaluated on fields such as: business, trade, taxation, government size, monetary freedom, investment, finance, right to property, freedom from corruption, labour.

Altman (2007) analyses the impact of economic freedom, including its various components, on the global economic

performance of a country. The author states that some specific indicators of IEF are positively correlated to higher levels of GDP per capita, while other indicators are in the opposite situation.

Hall and Lawson (2008) conclude concerning Altman's approaches (2007): ‚Altman's simple correlations add nothing to the on-going and important discussion about the role of economic freedom in contributing to aggregate economic performance"[28].

The specialised literature emphasises connections between the economic freedom and corruption. Graeff and Mehlkop (2003) investigate the impact of various components of the economic freedom on corruption. Also, in this case, the results confirm the fact that certain fields of economic freedom discourage corruption – financial and monetary freedom, freedom of affairs- while others favour corruption – size of government. At the same time, Rose-Ackerman (1997) remarks the possibility to increase corruption when obstacles are imposed in free development of economy. Eiras (2003) carries out a complex analysis, referring to ethics, corruption and economic freedom. The conclusions of the author[29] reveal relations between the economic freedom and corruption on the formal and informal economic activities. Informal economy, direct effect of the corruption phenomena will have a higher weight in GDP as long as the economic freedom disappears. „On average, the size of the informal economy in economically unfree and repressed economies is almost three times the size of the informal economy in free economies and almost double the size of the informal economy in mostly free economies"[30].

The following charts are illustrative in the study mentioned, showing "the relationship between economic freedom and the level of

[28] Hall, J., Lawson, R. (2008), "Theory and evidence on economic freedom and economic growth: A comment", Economics Bulletin, Vol. 15, No. 18, p. 3.
Altman, M. (2007), "How much Economic Freedom is Necessary for Economic Growth? Theory and Evidence", Economics Bulletin, Vol. 15, No. 2, pp. 1-20.
[29] Ana Isabel Eiras in Senior Policy Analyst for International Economies in the Center for International Trade and Economies at the Heritage Foundation.
[30] Eiras, A. J. (2003), "Ethics, Corruption and Economic Freedom" Conference "Ethical Foundations of the Economy", Krakow, Poland.

corruption in 95 countries around the world. Chart 1 shows a strong correlation between these two factors. As economic freedom vanishes, corruption flourishes. On average, as shown in Chart 2, the level of perceived morality- as a contrast to corruption- in economically free countries is almost four times the level of perceived morality in the public sector in mostly unfree or repressed economies, and almost 60 percent greater than in mostly free economies"[31].

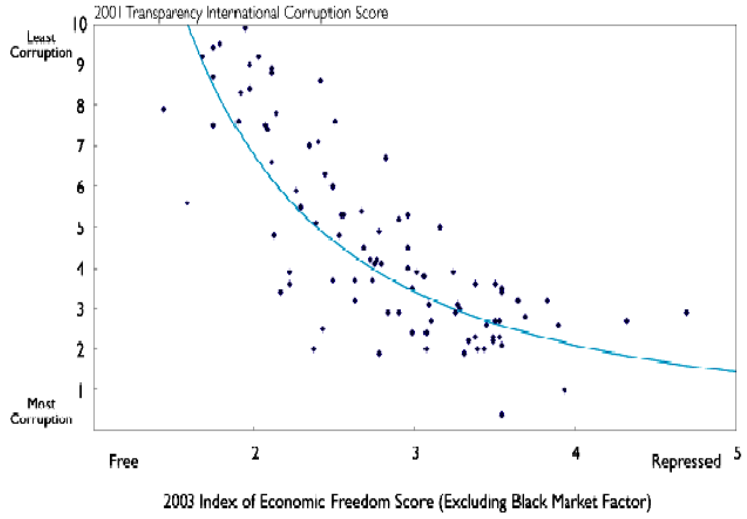

Chart 1. *Economic Freedom and Corruption*

Sources: Gerald P. O'Driscoll, Jr., Edwin J. Feulner, and Mary Anastasia O'Grady, 2003 *Index of Economic Freedom* (Washington, D.C.: The Heritage Foundation and Dow Jones & Company, Inc., 2003); Transparency International, *The Corruption Perception Index 2001 and 2000*, Berlin, Germany, 2001 and 2000, available at http://www.transparency.org/cpi/2001.htm and http://www.transparency.org/cpi/2000.htm

[31] Idem 3.

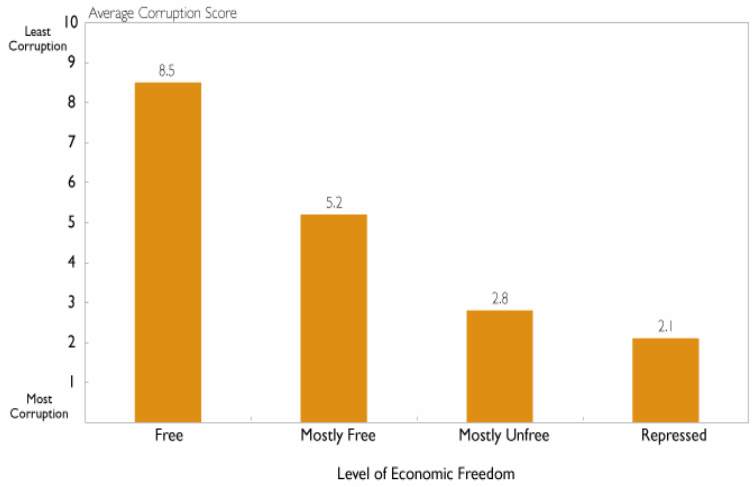

Chart 2. *Economic Freedom and Corruption*

Sources: Gerald P. O'Driscoll, Jr., Edwin J. Feulner, and Mary Anastasia O'Grady, 2003 *Index of Economic Freedom* (Washington, D.C.: The Heritage Foundation and Dow Jones & Company, Inc., 2003); Transparency International, *The Corruption Perception Index 2001 and 2000*, Berlin, Germany, 2001 and 2000, available at http://www.transparency.org/cpi/2001.htm and http://www.transparency.org/cpi/2000.htm

Mushfiq and Dean (2007) achieve similar studies with our study, using an econometric model applied in a panel of 60 countries, including the economic freedom as independent variable.

9.3. An empiric comparative study

The theoretical framework briefly presented in the first two chapters again substantiates the idea of some mutual determinations between public integrity, corruption and governance performance.

The following empirical study focuses on a sample of 11 states, most of them belonging to the former European communist space and situated at different EU integration levels: an older EU state (GR), 4 states that entered the EU in the last but one wave (2004), (HU, CZ, SK, SL), 2 states that entered EU in the last wave (RO, BG), or others in the process of adhering (HR, TR, MD, UA).

Extending the sample outside the South-Eastern European area also, was determined both by the need to obtain a more relevant comparative study and by the use of some empirical data as comprehensive as possible that can deliver the adequate support necessary for the statistical processing. The states taken into consideration belong to both the former Soviet Union (MD, UA), former Yugoslavia (HR, SI), Balkan area (GR, BG, TR), Central Europe (SK, CZ, HU) and, of course, Romania.

The analysed period is 1998 – 2008 and the results regarding the used indices belong to the World Bank, Transparency International, Global Integrity or Heritage Foundation.

9.3.1. Correlating the used indices for public integrity

We stopped both at the index for corruption perception of Transparency International and that of corruption control, annually computed by the World Bank. At the same time, we made a connection with the Global Integrity Index (G.I.) although, as the very ones who promote it are announcing that their computing methodology[32] is different from that of other governance and corruption specific indices. G.I. embodies an appreciable quantity of quantitative data delivered by more than 300 indices related to responsibility and governance transparency, as well as different anticorruption mechanisms, benefiting from the expertise of famous analysts and specialists in the complex field of public integrity.

Exactly as their presentation shows, G.I. does not measure the "corruption disease", but rather it tries to find remedies that the

[32] For the data regarding the computing methodology of the integrity index see Camerer, M., (2006), "Measuring Public Integrity", Journal of Democracy No. 17:1, National Endowment for Democracy and the Johns Hopkins University Press.

citizens and governments could use in order to fight against it.[33] Considering that it is impossible to accomplish a real corruption measuring[34], G.I. assesses the corruption's opposite – that is "the access that citizens and businesses have to a country's government, their ability to monitor its behaviour, and their ability to seek redness and advocate for improved governance".[35]

For 2008, the integrity indices have been organised on six big categories and 23 subcategories. The mentioned categories are: Civil Society, Public Information and Media, Elections, Government Accountability, Administration and Civil Service, Oversight and Regulation, Anti-Corruption and Rule of Law.[36]

The analysis preliminary to the results' completion regarding the G.I. refer not only to the formal aspects – the existence of the legislative framework, procedures, etc. – but also to their assessment and their application through the indices of personnel, budgetary support, political independence, the citizens' access to the most important anticorruption mechanisms. We insisted on a wider presentation of the G.I. approach model in order to substantiate, as it will be seen, an option of the present study for using the TI corruption perception index as a relevant index, from a statistical point of view, for determining the connections between public integrity and governance performance.

The quantitative data used in the statistical analysis are presented in Appendix 1, for the TI index, Appendix 2, for the control of corruption index of the World Bank (KKM) and Appendix 3, for the Global Integrity Index (GI).

In Table 1 are presented the Pearson linear correlations for the evolutions of the corruption perception index, TI, in the mentioned states.

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[33] http:/report.globalintegrity.org/globalIndex.cfm.
[34] An idea also supported by authors like Arndt and Oman (2006).
[35] The Global Integrity Report: 2008, Methodology White Paper, p. 1, http://globalintegrity.org/documents/Whitepaper2008.pdf.
[36] Idem, pp. 5-6.

Table 1

Pearson linear correlations of the corruption perception index computed by Transparency International

	TI_RO	TI_BG	TI_HU	TI_CZ	TI_SK	TI_GR	TI_SI	TI_HR	TI_TR	TI_MD	TI_UA	TI
TI_RO	1	-,169	,457	,931(**)	,787(**)	,518	,741(*)	,297	,848(**)	,419	,428	,906(**)
TI_BG	-,169	1	-,117	-,285	,284	-,817(**)	,161	,312	-,086	-,018	-,065	,116
TI_HU	,457	-,117	1	,465	,271	,366	-,028	,065	,648(*)	,711(*)	,004	,484
TI_CZ	,931(**)	-,285	,465	1	,784(**)	,610(*)	,768(**)	,211	,785(**)	,510	,501	,880(**)
TI_SK	,787(**)	,284	,271	,784(**)	1	,013	,867(**)	,437	,725(*)	,525	,571	,953(**)
TI_GR	,518	-,817(**)	,366	,610(*)	,013	1	,183	-,166	,427	,089	-,002	,235
TI_SI	,741(*)	,161	-,028	,768(**)	,867(**)	,183	1	,229	,528	,125	,731(*)	,808(**)
TI_HR	,297	,312	,065	,211	,437	-,166	,229	1	,491	,113	-,142	,438
TI_TR	,848(**)	-,086	,648(*)	,785(**)	,725(*)	,427	,528	,491	1	,593	,106	,873(**)
TI_MD	,419	-,018	,711(*)	,510	,525	,089	,125	,113	,593	1	,289	,582
TI_UA	,428	-,065	,004	,501	,571	-,002	,731(*)	-,142	,106	,289	1	,484
TI	,906(**)	,116	,484	,880(**)	,953(**)	,235	,808(**)	,438	,873(**)	,582	,484	1

Table 2

Pearson linear correlations of the control of corruption index computed by the World Bank

	KKM_RO	KKM_BG	KKM_HU	KKM_CZ	KKM_SK	KKM_GR	KKM_SI	KKM_HR	KKM_TR	KKM_MD	KKM_UA	KKM
KKM_RO	1	-,460	-,287	,419	-,344	-,022	,628	-,515	,062	,795	-,376	,382
KKM_BG	-,460	1	,822	-,426	,127	,552	-,152	,590	-,149	-,679	,024	,161
KKM_HU	-,287	,822	1	-,116	-,078	,827	,153	,458	-,326	-,505	-,468	,135
KKM_CZ	,419	-,426	-,116	1	-,748	-,093	,688	-,412	-,400	,396	-,668	-,200
KKM_SK	-,344	,127	-,078	-,748	1	,190	-,826	,598	,840	-,410	,746	,401
KKM_GR	-,022	,552	,827	-,093	,190	1	,139	,586	,091	-,258	-,405	,556
KKM_SI	,628	-,152	,153	,688	-,826	,139	1	-,546	-,522	,669	-,802	,122
KKM_HR	-,515	,590	,458	-,412	,598	,586	-,546	1	,365	-,663	,321	,395
KKM_T	,062	-,149	-,326	-,400	,840	,091	-,522	,365	1	-,046	,670	,628

R												
KKM_MD	,795	-,679	-,505	,396	-,410	-,258	,669	-,663	-,046	1	-,299	,258
KKM_UA	-,376	,024	-,468	-,668	,746	-,405	-,802	,321	,670	-,299	1	,129
KKM	,382	,161	,135	-,200	,401	,556	,122	,395	,628	,258	,129	1

Also, in Table 2 are presented the Pearson linear correlations for the evolutions of the control of corruption indices in the mentioned states. For each of the two tables there were introduced two variables, TI and KKM, representing the mean of the presented indices.

In order to ensure an unitary correlation framework, upon the KKM indices a translation and adnotation was performed so to place them in the same interval as the TI. Knowing the fact that the KKM index varies in the (-2.5, 2.5) interval, giving the conditions from above we obtain:

$$y = \frac{1}{2}TI - 2.5 \quad \text{or} \quad x = 2KKM + 5 \tag{1}$$

Also, for the G.I. index the following transformation:

$$z = \frac{1}{10}GI \tag{2}$$

The different assessment methodologies of these indices lead to the impossibility of drawing some common conclusions regarding the evolutions of the corruption phenomena in the analysed states. The support for this statement results also from *Table III.3* where there are presented the Pearson linear correlations between the TI and KKM indices. Moreover, the very value of - 0.386 for the correlations of the indices' means reveals negative correlations of the variables. The same conclusion results also from most of the correlations for indices at the level of the analysed states.

Table 3

Pearson linear correlations of the indices computed by TI and WB

Correlations

	KKM_ RO	KKM_ BG	KKM_ HU	KKM_ CZ	KKM_ GR	KKM_SI	KKM_ HR	KKM_ TR	KKM_ MD	KKM_ UA	KKM	KKM_ SK
TI_RO	,463	-,491	-,668	,141	-,552	-,204	-,218	,231	,207	,294	-,129	,043
TI_BG	-,688	,545	,153	-,748(*)	,004	-,895(**)	,621	,365	-,836(**)	,732(*)	-,080	,705
TI_HU	,168	-,499	-,461	,162	-,449	-,183	-,162	-,233	,131	-,015	-,490	-,136
TI_CZ	,606	-,687	-,713(*)	,176	-,556	-,046	-,452	,143	,443	,119	-,169	-,045
TI_SK	,065	-,374	-,682	-,322	-,697	-,580	-,217	,330	-,045	,636	-,315	,352
TI_GR	,732(*)	-,578	-,227	,682	,009	,613	-,350	-,280	,683	-,623	,052	-,532
TI_SI	,169	-,286	-,627	-,311	-,774(*)	-,730	-,685	,179	-,077	,625	-,380	,190
TI_HR	,300	,332	,148	,504	-,114	,411	,043	-,452	-,385	-,267	-,236	-,672
TI_TR	,182	-,467	-,491	,078	-,424	-,288	-,059	-,072	,084	,113	-,375	,005
TI_MD	,100	-,951(**)	-,805(*)	-,016	-,604	-,769(*)	-,517	,266	,443	,365	-,385	,345
TI_UA	,166	-,404	-,660	-,066	-,827(*)	-,083	-,705	,094	,250	,396	-,363	-,064
TI	,169	-,451	-,674	-,103	-,677	-,456	-,225	,174	,015	,445	-,386	,172

As a result, we will proceed to drawing some conclusions relevant for each type of correlations.

So, the analysis of Table III.1 results in contradictory evolutions of corruption perception between TI_BG and most of the other states' indices, the strongest being TI_GR (- 0.817), and the lowest TI_MD (- 0.018). For SK, as well as for RO, CZ, TR and MD, except for TI_BG, and for SI, except TI_HU, all the other correlations are positive, the strongest correlations, though not having a high level of significance. In Table III.4 are presented, in brief, the types of correlations with the other states.

Table 4

The synthesis of correlations and significance levels for the evolutions of corruption perception index, TI

Index	Positive correlations	Negative correlations	Sig 0.01 level	Sig 0.05 level
TI_RO	9	1	3	1
TI_BG	2	8	1	-
TI_HU	7	3	-	2
TI_CZ	9	1	4	1
TI_SK	70	0	3	1
TI_GR	7	3	1	1
TI_SI	9	1	2	2
TI_HR	8	2	-	-
TI_TR	9	2	1	2
TI_MD	9	1	0	1
TI_UA	7	3	-	1

The previous conclusions are stressed also by the correlations' analysis of the mean index for corruption perception (TI) from which we infer three levels of correlations:

- Weak – TI_BG (0.116) and TI_GR (0.235)
- Medium – TI_HU (0.484), TI_HR (0.438), TI_MD (0.582), TI_VA (0.484)
- Strong – TI_RO (0.906), TI_CZ (0.880), TI_SK (0.953), TI_SI (0.808), TI_TR (0.873).

From analysing Table 2, the synthesis of the correlations and significance levels is the one presented in **Table 5**.

Index	Positive correlations	Negative correlations	Sig 0.01 level	Sig 0.05 level
KKM_RO	4	6	-	1
KKM_BG	5	5	-	1
KKM_HU	4	6	-	2
KKM_CZ	3	7	-	1
KKM_SK	3	7	1	3
KKM_GR	6	4	-	1
KKM_SI	5	5	-	2
KKM_HR	6	4	-	-
KKM_TR	4	6	1	-
KKM_MD	3	7	-	-
KKM_UA	3	7	-	2

From this synthesis, as well as from Table 2 we observe that drawing certain conclusions is heavier. This is due, in our opinion, on one hand, to the complexity of the model used by the World Bank to determine the corruption control index, as well as the series of data insufficiently used.

This time we will find a negative correlation too, with the mean control of corruption index (KKM) for KKM_CZ (- 0.2). The other positive correlations with the mentioned index can be considered:

- Weak: KKM_BG (0.161), KKM_HU (0.135), KKM_SI (0.122), KKM_UA (0.129)
- Medium: KKM_RO (0.382), KKM_SK (0.401), KKM_HR (0.395), KKM_MD (0.258)
- Strong: KKM_GR (0.556), KKM_TR (0.628).

From the two analyses appear as obvious the differences or similarities between the processes of corruption perception and control of corruption (see Table 6).

Table 6

Compatibility of the methodological processes concerning the corruption perception and control of corruption

Compatibility		Incompatibility	
Major	Mean	Major	Mean
TR, BG	HR, MD	CZ, GR, SI	HU, UA, RO, SK

For Global Integrity Index, taking into account the available series of data, we cannot achieve correlations for the developments of the above indices in the states under analysis.

However, we calculated a mean index of integrity (GI) and on this basis we calculated the correlations with the other mean indices. The results are not surprising if we take into consideration the calculation "philosophy" of the Global Integrity Index, briefly presented in this study, the major differences between the legislative and procedural framework of anticorruption mechanisms and concrete public action, in view to change the social perception on this phenomenon in those states.

Table 7

Pearson linear correlations between mean indices of corruption perception and control of corruption and public integrity

Indicator	TI	KKM	GI
TI	1	-0.386	-0.797
KKM		1	0.701
GI			1

All correlations being significant for 0.01 level, we find out a negative correlation between TI and GI and another strong positive correlation between KKM and GI, whose justification derives once again from the calculation methodology.

Therefore, related to the significance of the regression coefficients, it is likely to use TI or KKM or GI index as dependant variable. In fact, a simple regression between the latter 2 indices leads to the relation:

$$KKM = 4.529 + 0.102\ GI + \varepsilon \quad (3)$$

with coefficients revealing a corresponding significance level.

The results included in Table III.7 emphasise a characteristic element for the states analysed, that could be transposed in the conclusion anticipated concerning social inefficiency for the mechanisms of anticorruption action, even in the conditions of an adequate legislative and procedural framework.

9.3.2. Correlations of the indicators of governmental performance

As stated, from the indices of governmental performance we took into consideration the Gross Domestic Product per capita (GDP) and the Index of Economic Freedom (IEF).

The qualitative data are presented in *Appendix 5* for GDP and *Appendix 6* for IEF. In statistical processing, we apply log GDP so that the statistic analyses use data of the same order of dimension.

Concerning GDP index, the correlations of the indices for the analysed states are not significant, taking into consideration the ascending evolution of GDP during the period analysed. At the same time, the correlations between IEF and GDP indices are approximately constant for each country, emphasizing either strong positive correlations (BG, HR, HU, RO, SK) but with a significance level almost null or negative correlations or almost null, with a high significance level (for the other states).

The correlations for IEF are more relevant (see Table 8).

Table 8

	IEF_BG	IEF_HR	IEF_CZ	IEF_GR	IEF_HU	IEF_MD	IEF_RO	IEF_SK	IEF_SI	IEF_TR	IEF_UA	IEF
IEF_BG	1	,334	-,515	-,455	,583	,003	,677	,963	,200	-,324	,728	,830
		,315	,105	,160	,060	,993	,022	,000	,556	,330	,011	,002
IEF_HR	,334	1	,171	-,157	,217	,178	,722	,397	,269	,349	,024	,587
	,315		,615	,644	,522	,600	,012	,227	,425	,292	,945	,058
IEF_CZ	-,515	,171	1	,776	,058	-,448	,079	-,405	,450	,782	-,783	-,084
	,105	,615		,005	,867	,167	,818	,216	,165	,004	,004	,807
IEF_GR	-,455	-,157	,776	1	,223	-,583	-,032	-,331	,589	,736	-,507	-,042
	,160	,644	,005		,511	,060	,926	,321	,057	,010	,112	,903
IEF_HU	,583	,217	,058	,223	1	-,093	,662	,587	,243	,372	,255	,767
	,060	,522	,867	,511		,786	,026	,057	,471	,260	,449	,006
IEF_MD	,003	,178	-,448	-,583	-,093	1	-,048	-,079	-,753	-,272	,286	-,095
	,993	,600	,167	,060	,786		,888	,818	,008	,418	,393	,781
IEF_RO	,677	,722(*)	,079	-,032	,662	-,048	1	,780	,491	,396	,202	,938
	,022	,012	,818	,926	,026	,888		,005	,125	,228	,552	,000
IEF_SK	,963	,397	-,405	-,331	,587	-,079	,780	1	,355	-,163	,678	,905
	,000	,227	,216	,321	,057	,818	,005		,284	,632	,022	,000
IEF_SI	,200	,269	,450	,589	,243	-,753	,491	,355	1	,481	-,109	,496
	,556	,425	,165	,057	,471	,008	,125	,284		,134	,751	,120
IEF_TR	-,324	,349	,782	,736	,372	-,272	,396	-,163	,481	1	-,604	,233
	,330	,292	,004	,010	,260	,418	,228	,632	,134		,049	,491
IEF_UA	,728	,024	-,783	-,507	,255	,286	,202	,678	-,109	-,604	1	,457
	,011	,945	,004	,112	,449	,393	,552	,022	,751	,049		,157
IEF	,830	,587	-,084	-,042	,767	-,095	,938	,905	,496	,233	,457	1
	,002	,058	,807	,903	,006	,781	,000	,000	,120	,491	,157	

The analysis on the results in Table 8 emphasise different policies of economic freedom, therefore it is hard to establish the perspective. The synthesis of the developments and significance levels is presented in Table 9.

Table 9

Synthesis of IEF correlations

Index	Positive correlations	Negative correlations	Sig 0.01 level	Sig 0.05 level
IEF_BG	7	3	1	2
IEF_HR	8	2	-	1
IEF_CZ	6	4	3	-
IEF_GR	4	6	2	-
IEF_HU	9	1	-	1
IEF_MD	3	7	1	-
IEF_RO	8	2	1	3
IEF_SK	6	4	2	1
IEF_SI	8	2	1	-
IEF_TR	6	4	2	1
IEF_UA	6	4	1	2

In Table 9, we emphasise the situation for HU, whose policy of economic freedom positively correlates with most states and at extreme, MD which has negative correlations with most states analysed.

The correlations with a mean index of economic freedom underline evolutions almost independent related to the other states (CZ (- 0.084), GR (- 0.042), MD (- 0.195), weak correlated (TR (0.233)), mean correlated (HR (0.587), SI (0.496) or (UA (0.457)) and strong correlated (BG (0.830), HU (0.767), RO (0.938), SK (0.905)).

9.3.3. Linear regressions

The analyses reveal that the single interesting regressions in view of the current study are those using TI or GI (or KKM) as dependent variables and IEF and GDP as independent variables. In order to emphasise statistically the influence of the European

integration process on public integrity, we introduced an independent variable "dummy", called UE, awarding the following values for each state during the analysed period:

$$UE = \begin{cases} 1, & \text{if the respective state is EU Member State} \\ 0, & \text{in the opposite case} \end{cases}$$

UE variable introduced in the above regressions will underline quantitatively the influence of the integration process on the indices of public integrity.

For TI, we obtain:

$$TI = -2.944 + 0.759\ IEF + 0.606\ Log\ GDP + \varepsilon_1 \quad (4)$$
$$(0.219) \quad (0.371) \quad (0.699)$$

or

$$TI = -1.122 + 0.654\ IEF + 0.287\ Log\ GDP + 0.276\ UE + \varepsilon_3 \quad (5)$$
$$(0.832) \quad (0.485) \quad (0,877) \quad (0.701)$$

In both situations, the significance levels of the coefficients are in parentheses.

Unfortunately, lacking comprehensive series of data, for the other regression, the significance levels of the coefficients are null.

Both expressions (4) and (5) help us to determine, approximately, possible influences of the governance indices on public integrity, expressed by means of TI.

As an example, for Romania, the increase by 0.5 of IEF index (in reality by 5, according to formula 2) will lead to an increase by 0.33 of the index concerning perception on corruption, taking into consideration the influence of the European integration process, thus it results an increase by 0.4.

In 2007, the year of Romania's accession in the EU, the increase by 0.6 of the index concerning perception on corruption is due especially to the mentioned event (0.56), according to (5).

GDP growth influences significantly TI index only if it exceeds the annual mean of GDP evolution. Thus, for Romania, an

increase by 1500$ of GDP will lead to an increase by 0.0125 of TI index. Consequently, the index of economic freedom will have the most significant influence and UE index will have the most significant influence at the moment of accession of a state in the EU.

9.4. Conclusions

The study presents a new approach for public integrity in view of the influence of the indices concerning GDP and economic freedom. The further developments might take in consideration both enlargement of the area of analysis, comprising more states and longer periods, and introducing new indices for governmental performance.

At the same time, even in the conditions of the current study, other relevant regressions could be determined. For example, if GDP is dependant variable and TI and IEF independent variables, we obtain:

$$\text{Log GDP} = \underset{(0.020)}{1.139} + \underset{(0.699)}{0.032\ \text{TI}} + \underset{(0.002)}{0.467\ \text{IEF}} + \varepsilon_3 \quad (6)$$

or introducing UE variable:

$$\text{Log GDP} = \underset{(0.037)}{1.994} + \underset{(0.877)}{0.013\ \text{TI}} + \underset{(0.066)}{0.326\ \text{IEF}} + \underset{(0.247)}{0.168\ \text{UE}} + \varepsilon_4 \quad (7)$$

Continuing the judgements, we shall obtain for IEF:

$$\text{IEF} = \underset{(0.450)}{-0.781} + \underset{(0.371)}{0.133\ \text{TI}} + \underset{(0.002)}{1.53\ \text{Log GDP}} + \varepsilon_5 \quad (8)$$

$$\text{IEF} = \underset{(0.843)}{0.432} + \underset{(0.485)}{0.110\ \text{TI}} + \underset{(0.066)}{1.237\ \text{Log GDP}} + \underset{(0.530)}{0.184\text{UE}} + \varepsilon_6 \quad (9)$$

All the above regressions reveal a strong dependency between IEF and GDP. For more consistent series of data, the significance level of the coefficients of regression will increase.

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Appendix 1

Transparency International Corruption Perceptions Index 1998-2008

Year	Romania (RO)	Bulgaria (BG)	Hungary (HU)	Czech Republic (CZ)	Slovakia (SK)	Greece (GR)	Slovenia (SI)	Croatia (HR)	Turkey (TR)	Moldova (MD)	Ukraine (UA)
1998	3.1	2.9	5.0	4.8	3.9	4.9			3.4		2.8
1999	3.3	3.3	5.2	4.6	3.7	4.9	6.0	2.7	3.6	2.6	2.6
2000	2.9	3.5	5.2	4.3	3.5	4.9	5.5	3.7	3.8	2.6	1.5
2001	2.8	3.9	5.3	3.9	3.7	4.2	5.2	3.9	3.6	3.1	2.1
2002	2.6	4.0	4.9	3.7	3.7	4.2	6.0	3.8	3.2	2.1	2.4
2003	2.8	3.9	4.8	3.9	3.7	4.3	5.9	3.7	3.1	2.4	2.3
2004	2.9	4.1	4.8	4.2	4.0	4.3	6.0	3.5	3.2	2.3	2.2
2005	3.0	4.0	5.0	4.3	4.3	4.3	6.1	3.4	3.5	2.9	2.6
2006	3.1	4.0	5.2	4.8	4.7	4.4	6.4	3.4	3.8	3.2	2.8
2007	3.7	4.1	5.3	5.2	4.9	4.6	6.6	4.1	4.1	2.8	2.7
2008	3.8	3.6	5.1	5.2	5.0	4.7	6.7	4.4	4.6	2.9	2.5

Source: www.transparency.org

Appendix 2

World Bank Control of Corruption Index (KKM)

Year	Romania	Bulgaria	Hungary	Czech Republic	Slovakia	Greece	Serbia	Slovenia	Croatia	Turkey	Moldova	Ukraine
1998	-0.11	-0.23	0.74	0.82	0.23	0.68	-1.30	1.7	-0.16	-0.05	-0.26	-0.96
1999												
2000	-0.19	-0.14	0.82	0.69	0.33	0.81	-1.20	0.98	0.11	-0.06	-0.59	-0.97
2001												
2002	-0.24	-0.02	0.84	0.74	0.28	0.72	-0.91	0.97	0.02	-0.14	-0.72	-0.84
2003	-0.22	-0.10	0.82	0.80	0.36	0.77	-0.97	0.92	0.06	0.02	-0.78	-0.85
2004	-0.17	-0.06	0.82	0.70	0.48	0.82	-0.70	0.87	0.11	0.11	-0.62	-0.71
2005	-0.23	-0.19	0.71	0.74	0.44	0.65	-0.86	0.79	0.06	0.08	-0.57	-0.57
2006	-0.21	-0.19	0.76	0.73	0.41	0.68	-0.59	0.79	-0.05	-0.01	-0.65	-0.77
2007	-0.17	-0.14	0.74	0.77	0.35	0.65	-0.57	0.84	0.03	0.00	-0.66	-0.70

Source: http://www.worldbank.org/

Appendix 3

Global Integrity Index

Global Integrity Index			
The State	Year		
	2008	2007	2006
Bulgaria	87.0	87.0	80
Croatia			
Czech Republic			
Greece			
Moldova	68.0	60.0	
Romania	80.0	81.0	86.0
Slovakia			
Slovenia			
Turkey	69.0	71.0	
Ukraine		68.0	
Hungary	77.0		

Source: http://www.report.globalintegrity.org/globalIndex.cfm

Appendix 4

Year	Romania	Bulgaria	Hungary	Czech Republic	Slovakia	Greece	Slovenia	Croatia	Turkey	Moldova	Ukraine
1998	5.841.958	5477.05	10.550.932	13.745.803	10.690.076	16.746.918	15.565.882	8736.72	8.103.731	1.437.781	2.936.989
1999	5.886.238	5.714.082	11.178.707	14152.22	10.827.393	17.484.193	16.568.128	8.684.596	7.825.376	1.409.092	2.990.677
2000	6.171.507	6199.81	12.052.619	15.007.517	11.217.903	18.587.874	17.602.617	9.487.722	8.149.598	1.472.371	3.316.795
2001	6.710.511	6.653.744	12.871.208	15.816.589	11.867.247	19.822.961	18.547.354	10.018.956	7.739.835	1.603.623	3.739.701
2002	7.204.313	7.120.287	13.702.771	16.405.646	12.639.343	20.904.433	19.551.164	10.747.971	8.226.385	1.762.427	4.038.091
2003	7.769.154	7.684.231	14.625.334	17344.17	13.512.702	22.380.907	20.514.626	11.565.336	8.705.242	1.923.758	4.554.824
2004	8.676.224	8.462.637	15.780.271	18.744.338	14.558.998	23.973.164	21.508.347	12.327.775	9.844.432	2.126.005	5.282.395
2005	9.334.619	9.322.486	16.996.586	20.289.544	15.970.747	25.481.636	22.977.456	13.234.634	11.005.798	2.507.868	5.625.911
2006	10426.16	10.293.976	18250.9	22184.25	17871.13	27.332.603	24.971.021	14.309.071	12.094.915	2.690.524	6.253.454
2007	11.386.509	11.302.483	19.026.503	24.235.511	20.251.125	29.172.089	27.204.876	15.549.453	12.888.286	2900.54	6.941.315
2008	12.285.071	12251.92	19.799.233	25764.79	22.024.495	30.745.408	28.848.256	16.536.688	13.511.161	3.165.931	7531.85

Source: www.indexmundi.com

Appendix 5

Economic Freedom INDEX

Economic freedom is the fundamental right of every human to control his or her own labour and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please, with that freedom both protected by the state and unconstrained by the state. In economically free societies, governments allow labour, capital and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself. We measure ten components of economic freedom, assigning a grade in each using a scale from 0 to 100, where 100 represents the maximum freedom. The ten component scores are then averaged to give an overall economic freedom score for each country. The ten components of economic freedom are: Business Freedom | Trade Freedom | Fiscal Freedom | Government Size | Monetary Freedom | Investment Freedom | Financial Freedom | Property rights | Freedom from Corruption | Labour Freedom.

The State	Score 1998	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption
Bulgaria	45,7	55	49,0	53,5	48,8	25,2	50	50	50	30
Croatia	51,7	55	60,8	68,3	39,5	61,8	50	50	30	50
Czech Republic	68,4	85	77,4	54,7	39,3	75,9	70	90	70	54
Greece	60,6	70	77,8	53,3	52,5	71,4	70	30	70	50
Hungary	56,9	70	61,0	55,7	2,9	63,8	70	70	70	49
Moldova	53,5	70	75,0	57,7	52,7	46,3	50	50	50	30
Montenegro	-	-	-	-	-	-	-	-	-	-
Romania	54,4	55	74,0	43,9	64,3	52,1	70	50	30	50
Serbia	-	-	-	-	-	-	-	-	-	-
Slovakia	57,5	70	73,0	66,4	35,4	72,7	50	50	50	50
Slovenia	60,7	70	59,0	51,8	37,3	68,4	70	70	70	50
Turkey	60,9	70	73,8	58,4	68,5	31,8	70	70	70	35
Ukraine	40,4	55	53,0	64,4	51,0	0,0	50	30	30	30

The State	Score 1999	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption
Bulgaria	46,2	55	46,8	68,0	46,3	0,0	70	50	50	30
Croatia	53,1	55	63,8	68,4	38,4	72,1	50	50	30	50
Czech Republic	69,7	85	79,8	59,2	44,8	76,4	70	90	70	52
Greece	61,0	70	77,8	47,6	55,8	73,9	70	30	70	54
Hungary	59,6	70	63,2	62,6	12,8	66,3	70	70	70	52
Moldova	56,1	70	75,0	58,5	55,1	65,9	50	50	50	30
Montenegro	-	-	-	-	-	-	-	-	-	-
Romania	50,1	55	74,0	45,0	65,1	27,0	70	50	30	34
Serbia	-	-	-	-	-	-	-	-	-	-
Slovakia	54,2	70	73,0	53,0	17,6	74,0	50	50	50	50
Slovenia	61,3	70	59,0	52,4	39,5	70,8	70	70	70	50
Turkey	59,2	70	74,4	57,0	57,1	31,8	70	70	70	32
Ukraine	43,7	55	53,0	63,0	43,0	39,3	50	30	30	30

The State	Score 2000	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption
Bulgaria	47,3	55	49,8	67,9	54,4	0,0	70	50	50	29
Croatia	53,6	55	67,0	68,9	41,9	70,0	50	50	30	50
Czech Republic	68,6	85	72,0	58,1	49,6	75,0	70	90	70	48
Greece	61,0	70	77,8	52,2	54,4	75,5	70	30	70	49
Hungary	64,4	70	76,6	63,9	39,3	69,6	70	70	70	50
Moldova	59,6	70	75,0	55,8	85,5	69,9	50	50	50	30
Montenegro	-	-	-	-	-	-	-	-	-	-
Romania	52,1	55	74,0	58,3	63,3	38,1	70	50	30	30
Serbia	-	-	-	-	-	-	-	-	-	-
Slovakia	53,8	70	71,2	54,8	25,0	73,9	50	50	50	39
Slovenia	58,3	70	73,6	52,9	36,5	71,9	50	50	70	50
Turkey	63,4	70	75,0	67,2	82,7	31,8	70	70	70	34
Ukraine	47,8	55	70,0	62,3	41,9	63,0	50	30	30	28

The State	Score 2001	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption
Bulgaria	51,9	55	57,2	58,1	67,3	26,2	70	50	50	33
Croatia	50,7	55	71,6	66,9	33,7	71,7	50	50	30	27
Czech Republic	70,2	85	72,8	67,5	49,6	81,2	70	90	70	46
Greece	63,4	70	78,0	50,9	54,4	78,3	70	50	70	49
Hungary	65,6	70	77,8	65,7	41,9	73,3	70	70	70	52
Moldova	54,9	55	76,4	54,5	76,5	55,9	50	50	50	26
Montenegro	-	-	-	-	-	-	-	-	-	-
Romania	50,0	55	73,4	57,6	79,7	41,4	50	30	30	33
Serbia	-	-	-	-	-	-	-	-	-	-
Slovakia	58,5	70	80,2	59,3	39,3	70,8	70	50	50	37
Slovenia	61,8	85	67,4	52,8	47,1	73,6	50	50	70	60
Turkey	60,6	70	73,0	66,9	73,0	36,4	70	50	70	36
Ukraine	48,5	55	70,0	63,8	49,6	62,3	50	30	30	26

The State	Score 2002	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption
Bulgaria	57,1	55	60,2	68,3	49,6	75,8	70	50	50	35,0
Croatia	51,1	55	68,8	68,3	25,0	75,7	50	50	30	37,0
Czech Republic	66,5	70	73,0	66,8	33,7	82,2	70	90	70	43,0
Greece	59,1	70	79,6	50,1	54,4	78,7	50	50	50	49,0
Hungary	64,5	70	80,0	65,5	28,0	74,7	70	70	70	52,0
Moldova	57,4	55	76,0	78,2	76,5	54,7	50	50	50	26,0
Montenegro	46,6	40	88,4	89,8	74,8	46,8	10	30	30	10,0
Romania	48,7	55	74,4	64,4	58,9	46,6	50	30	30	29,0
Serbia	46,6	40	88,4	89,8	74,8	46,8	10	30	30	10,0
Slovakia	59,8	70	79,8	61,1	33,7	68,8	70	70	50	35,0
Slovenia	57,8	85	64,2	51,8	41,9	72,0	50	50	50	55,0
Turkey	54,2	55	79,6	65,2	58,9	41,0	50	50	50	38,0
Ukraine	48,2	55	71,0	66,1	58,9	58,2	50	30	30	15,0

The State	Score 2003	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption
Bulgaria	57,0	55	62,4	72,4	56,7	77,5	50	50	50	39,0
Croatia	53,3	55	72,8	77,6	28,6	76,3	50	50	30	39,0
Czech Republic	67,5	70	73,6	67,2	45,6	81,9	70	90	70	39,0
Greece	58,8	70	81,4	57,2	50,3	78,5	50	50	50	42,0
Hungary	63,0	70	76,0	65,6	22,3	70,6	70	70	70	53,0
Moldova	60,0	55	80,4	81,3	78,6	63,4	50	50	50	31,0
Montenegro	43,5	40	68,4	79,8	89,2	34,2	10	30	30	10,0
Romania	50,6	55	60,2	69,1	62,4	50,8	50	50	30	28,0
Serbia	43,5	40	68,4	79,8	89,2	34,2	10	30	30	10,0
Slovakia	59,0	70	72,8	67,5	22,3	71,3	70	70	50	37,0
Slovenia	57,7	85	62,2	53,1	40,6	76,7	50	50	50	52,0
Turkey	51,9	55	73,6	64,6	45,0	42,9	50	50	50	36,0
Ukraine	51,1	55	74,6	67,1	68,1	64,0	30	50	30	21,0

The State	Score 2004	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption
Bulgaria	59,2	55	63,2	81,1	64,5	78,7	50	70	30	40,0
Croatia	53,1	55	65,4	67,3	22,9	79,5	50	70	30	38,0
Czech Republic	67,0	70	73,4	67,0	40,9	84,6	70	90	70	37,0
Greece	59,1	70	79,8	58,4	53,2	78,1	50	50	50	42,0
Hungary	62,7	70	76,0	65,6	20,1	73,7	70	70	70	49,0
Moldova	57,1	55	80,4	81,5	74,2	71,3	30	50	50	21,0
Montenegro	-	-	-	-	-	-	-	-	-	-
Romania	50,0	55	57,6	69,9	74,8	56,8	30	50	30	26,0
Serbia	-	-	-	-	-	-	-	-	-	-
Slovakia	64,6	70	72,8	68,5	42,4	80,8	70	90	50	37,0
Slovenia	59,2	85	65,2	54,4	40,6	77,3	50	50	50	60,0
Turkey	52,8	55	74,2	60,8	56,9	46,1	50	50	50	32,0
Ukraine	53,7	55	74,4	67,5	77,8	74,5	30	50	30	24,0

The State	Score 2005	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption	Labour Freedom
Bulgaria	62,3	55	82,0	80,3	53,4	83,1	50	70	30	39,0	80,3
Croatia	51,9	55	65,4	59,3	26,2	81,4	50	70	30	37,0	44,3
Czech Republic	64,6	70	76,8	68,2	15,1	88,9	70	90	70	39,0	57,7
Greece	59,0	70	80,2	58,0	54,4	78,1	50	50	50	43,0	56,1
Hungary	63,5	70	70,0	67,9	25,6	75,6	70	70	70	48,0	68,2
Moldova	57,4	55	77,2	84,5	68,5	70,0	30	50	50	24,0	64,8
Montenegro	-	-	-	-	-	-	-	-	-	-	-
Romania	52,1	55	70,4	70,1	68,9	62,6	30	50	30	28,0	55,5
Serbia	-	-	-	-	-	-	-	-	-	-	-
Slovakia	66,8	70	72,8	81,9	42,4	78,0	70	90	50	37,0	75,7
Slovenia	59,6	85	81,8	55,6	45,3	79,1	50	50	50	59,0	40,3
Turkey	50,6	55	76,0	65,3	54,4	53,8	50	30	50	31,0	40,7
Ukraine	55,8	55	76,2	83,0	78,6	76,2	30	50	30	23,0	55,8

The State	Score 2006	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption	Labour Freedom
Bulgaria	64,1	70,5	65,8	83,2	49,8	80,7	70	70	30	41	79,8
Croatia	53,6	54,5	78,4	69,6	23,2	81,2	50	70	30	35	44,6
Czech Republic	66,4	57,8	82,4	68,8	36,8	85,9	70	90	70	42	60,3
Greece	60,1	73,2	82,4	61,0	53,9	78,7	50	50	50	43	58,6
Hungary	65,0	70,8	82,4	68,2	27,1	74,3	70	70	70	48	69,5
Moldova	58,0	67,4	79,4	81,9	66,1	68,4	30	50	50	23	63,4
Montenegro	-	-	-	-	-	-	-	-	-	-	-
Romania	58,2	74,6	68,4	87,5	68,9	66,6	50	50	30	29	57,5
Serbia	-	-	-	-	-	-	-	-	-	-	-
Slovakia	69,8	69,3	82,4	89,5	52,5	77,8	70	90	50	40	76,7
Slovenia	61,9	75,1	82,4	64,0	44,3	81,7	70	50	50	60	41,6
Turkey	57,0	66,7	81,0	68,0	68,1	64,7	50	50	50	32	39,1
Ukraine	54,4	43,1	77,2	90,2	75,8	72,9	30	50	30	22	53,2

The State	Score 2007	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption	Labour Freedom
Bulgaria	62,7	70,3	70,8	82,4	57,8	75,8	60	60	30	40	79,8
Croatia	53,4	54,2	87,8	69,9	24,4	79,3	50	60	30	34	44,5
Czech Republic	67,4	61,1	86,6	69,9	47,1	86,3	70	80	70	43	20,0
Greece	58,7	69,7	81,6	62,4	53,4	78,4	50	40	50	43	44,2
Hungary	64,8	70,2	86,6	68,8	26,8	76,6	70	60	70	50	44,0
Moldova	58,7	68,1	79,4	85,6	62,8	68,0	30	50	50	29	61,7
Montenegro	-	-	-	-	-	-	-	-	-	-	64,4
Romania	61,2	73,2	84,0	85,9	71,0	69,7	50	60	30	30	41,5
Serbia	-	-	-	-	-	-	-	-	-	-	84,9
Slovakia	69,6	70,7	86,6	89,5	53,7	76,6	70	80	50	43	32,7
Slovenia	59,6	72,9	86,6	54,6	30,9	78,9	70	50	50	61	97,8
Turkey	57,4	67,4	81,0	69,1	62,4	70,1	50	50	50	35	78,9
Ukraine	51,5	43,6	77,2	83,6	53,2	68,4	30	50	30	26	30,0

The State	Score 2008	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption	Labour Freedom
Bulgaria	63,7	68,4	86,0	82,7	56,0	73,7	60	60	30	40	80,6
Croatia	54,1	58,5	87,6	68,8	28,0	78,8	50	60	30	34	45,5
Czech Republic	68,1	64,2	86,0	71,3	45,6	80,3	70	80	70	48	66,1
Greece	60,6	70,4	81,0	65,6	57,8	78,5	50	50	50	44	58,8
Hungary	67,6	74,4	86,0	70,0	26,5	77,2	80	70	70	52	70,3
Moldova	57,9	69,3	79,2	83,0	56,9	67,6	30	50	50	32	60,7
Montenegro	-	-	-	-	-	-	-	-	-	-	-
Romania	61,7	74,9	86,0	85,6	70,8	72,5	60	50	30	31	56,3
Serbia	-	-	-	-	-	-	-	-	-	-	-
Slovakia	70,0	69,5	86,0	89,4	53,9	76,9	70	80	50	47	77,1
Slovenia	60,2	74,1	86,0	62,4	33,2	79,5	60	50	50	64	42,4
Turkey	59,9	68,3	86,8	77,7	68,3	70,8	50	50	50	38	39,5
Ukraine	51,0	44,4	82,2	79,0	43,0	69,9	30	50	30	28	53,1

The State	Score 2009	Business Freedom	Trade Freedom	Fiscal Freedom	Government Size	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption	Labour Freedom
Bulgaria	64.6	73.5	85.8	86.2	58.7	72.8	60.0	60.0	30.0	41.0	78.4
Croatia	55.1	59.9	87.6	68.7	31.iul	79.0	50.0	60.0	30.0	41.0	43.4
Czech Republic	69.4	65.1	85.8	80.2	43.0	79.7	70.0	80.0	70.0	52.0	67.8
Greece	60.8	78.7	80.8	66.5	46.3	78.8	50.0	50.0	50.0	46.0	61.2
Hungary	66.8	77.4	85.8	70.6	19.feb	73.8	80.0	70.0	70.0	53.0	68.4
Moldova	54.9	70.1	81.6	85.3	51.3	67.6	30.0	50.0	40.0	28.0	45.1
Montenegro	58.2	68.7	80.2	89.1	45.3	78.9	40.0	50.0	40.0	33.0	57.2
Romania	63.2	74.9	85.8	87.0	70.0	75.0	60.0	50.0	35.0	37.0	57.1
Serbia	56.6	56.0	78.0	85.9	46.3	65.8	40.0	50.0	40.0	34.0	70.0
Slovakia	69.4	73.4	85.8	84.1	57.4	78.7	70.0	70.0	50.0	49.0	75.4
Slovenia	62.9	84.4	85.8	62.9	38.4	78.6	60.0	50.0	60.0	66.0	42.8
Turkey	61.6	69.9	86.6	73.2	83.4	71.1	50.0	50.0	50.0	41.0	40.3
Ukraine	48.8	40.5	84.0	77.0	39.0	68.1	30.0	40.0	30.0	27.0	52.4

Source: http://www.heritage.org/Index/Default.aspx