**Yelena G. Popova**[1]

# INTERDEPENDENCE OF SOCIAL MODEL FACTORS AND CORRUPTION

*The research reveals the dependencies between the corruption level and the factors of social system. The countries are divided according to the adopted social model; the detected dependencies vary in different models.*
*Keywords: corruption; social model; statistical dependencies; regression.*

**Олена Г. Попова**

# ВЗАЄМОЗАЛЕЖНІСТЬ ЧИННИКІВ СОЦІАЛЬНОЇ МОДЕЛІ І КОРУПЦІЇ

*У статті виявлено залежності між рівнем корупції та чинниками соціальної системи. Країни поділено за принципом створеної соціальної моделі, оскільки в країнах з різними соціальними моделями залежності значно різняться.*
*Ключові слова: корупція; соціальна модель; статистичні залежності; регресія.*
*Табл. 3. Літ. 16.*

**Елена Г. Попова**

# ВЗАИМОЗАВИСИМОСТЬ ФАКТОРОВ СОЦИАЛЬНОЙ МОДЕЛИ И КОРРУПЦИИ

*В статье выявлены зависимости между уровнем коррупции и факторами социальной системы. Страны поделены по принципу созданной социальной модели, поскольку в странах с различными социальными моделями зависимости значительно различаются.*
*Ключевые слова: коррупция; социальная модель; статистические зависимости; регрессия.*

**Problem statement.** The World Bank defines corruption as an abuse of public office power for private gains (2007). The problem of corruption is common for all countries, since they have the situation of opposing private interests and power of authority.

Corruption is a result of management inefficiency or wrong public relations and creates new problems in these areas. As a result, the world faces the expansion of existing and the appearance of new forms of corruption. The defects of management give birth to new defects. Corruption has become an institutional trap. People suppose that the cost of corruption is lower than the price of fighting it. As a result, many countries condemn corruption on paper, but do nothing in fact.

Social sector presents the clash of interests of population and officials in all countries and is the most susceptible to corruption. Corruption forms wrong economic relations violating the fundamental laws of economic development. The level of corruption is different in all countries. It is impossible to determine the level of corruption according to the economic development of a country, for example, corruption in Uruguay is lower than in France (TI, 2012).

**Literature review.** A great deal of researches is dedicated to corruption showing different approaches to it. Leff (1964) and Friedrich (1972) think that corruption can facilitate and enhance economy via catalysing business and investments.

---

[1] Transport and Telecommunication Institute, Riga, Latvia.

Rogers (2008), Haque and Knellar (2007) suppose that social system gives most possibilities for corruption. Abed and Davoodi (2000) show that corruption increases income inequality: a one-standard deviation increase in the growth rate of corruption reduces income growth of the poor by 7.8% a year. Rose-Ackerman (2008) argues that corruption also tends to distort the allocation of economic benefits leading to inequitable income distribution. Mauro (2002) states that corruption level has direct effect on health and education expenditures, reducing them significantly, since these projects offer few opportunities for rent seeking. Gupta et al (2000) show that corruption reduces the level of social spending, fosters education inequality, causes unequal distribution of land.

However, Filmer and Pritchett (2001), Kaufmann et al. (2003) do not find any statistical validation that a considerable increase in investments in healthcare has any significant influence on the indicators of population health.

Gupta and Verhoeven (2006) consider the probable significant dependence between increased investment in healthcare and population health indicators really exists, and these investments effectively decrease child mortality and increase life expectancy; the level of child mortality is lower in the countries with low level of corruption and high administration quality.

Grekoff (2013) explains these differences in the statistical analysis interpretation by the fact that there are different situations with corruption in different countries. Different countries demonstrate different efficiency of government administration. The countries, investing in their healthcare systems directly, have better health indicators than other countries where government administration and investment management are not well established.

**The research objective.** There are numerous researchers developing the relationships between corruption and other factors but there are practically no researches devoted to describing corruption in terms of social models. The research goal is to discover the impact of corruption on indicators grouped according to the social model adopted within the country.

**Presentation of the research materials, methodology and key findings.** The methods of qualitative content analysis, grouping, comparison and analysis have been used for determining the social models and the factors significant for these models.

The empirical analysis is based on the Corruption Perception Index (CPI) by Transparency International (TI). CPI ranges from 0 to 10; 10 indicates that a country is practically clean from corruption; the lower the index value is, the more corrupted the country is.

The statistical analysis, correlation and regression analyses are employed for determining the interdependent factors.

There are 4 social models, functioning on the territory of the European Union; however, only the two of them, Continental and Scandinavian, are the objects of this research. The main principle of Scandinavian model is egalitarianism; Continental model is used in the majority of European countries, its principle is social protection for people who have already been present at the labour market and have accumulated funds. Continental model is used in many European countries; Scandinavian model is especially efficient (Strelchonok and Popova, 2012).

The statistical data for 7 years (2005−2011) provided by the Eurostat (2013) have been used for regression analysis. All government expenditures have been taken per capita.

The detected problem for regression analysis implementation: not all countries, presenting the Continental social model, have the same level of economic development. To overcome it the countries within the Continental model are divided into 2 groups − well-developed countries (Cont.I) and less developed countries (Cont.II) (the division was performed by the level of GDP per capita). France, Germany, the Netherlands, Austria, Czech Republic, Poland present Cont.I, and Hungary, Estonia, Latvia, and Lithuania − Cont.II.

The first stage of analysis: construction of correlation matrices for the models. Second, the factors with the correlations above 0.7 have been selected, and the data for models have been compared.

Scandinavian model has demonstrated low levels of correlations, and the most important thing is the absence of high correlation of the corruption factor with any other factors. Scandinavian model is the most favourable one for human capital development, the efficiency of all investments in social spheres is very high.

Cont.I model unexpectedly presents the greatest number of factors, demonstrating correlations between corruption and other factors (Table 1).

*Table 1.* **Correlation of factors**

| Factor | Value |
|---|---|
| Expenditures on education | 0.9168 |
| Quintile coefficient | -0.875 |
| Expenditures on R&D | 0.859 |
| Level of employment | 0.788 |
| Social expenditures | 0.8235 |

Cont.II model shows the correlations between corruption and expenditures on poverty, the value is -0.758.

Next stage: the regression analysis is to determine the factors for which the corruption factor is significant. The research is taken for the countries, grouped by the models. The results of regression analysis are presented in Tables 2−4.

*Table 2.* **Scandinavian model, regression types**

| | Corruption | |
|---|---|---|
| | $R^2$ | Type |
| **Norway** | 0.553 | pol |
| **Sweden** | 0.125 | log |
| **Iceland** | 0.987 | pol |
| **Finland** | 0.715 | pol |
| **Denmark** | 0.824 | pol |

Corruption presents a polynomial regression type for these models, but the quality of regression models represented by $R^2$ is very different. The greatest deviation for Scandinavian model is done by Sweden. The corruption index for this country is not the highest one but the most stable one for all the examined years, practically without any fluctuations. The model Cont.I presents relatively smooth deviations of $R^2$ indicator; the biggest deviations are presented by the Netherlands and Germany. The

model Cont.II presents very low values of $R^2$ for all the countries, the regression model explains very rare cases of deviations for this model. Corruption is also a statistically significant factor for the level of poverty for this model. $R^2$ values for the poverty factor are high. These countries present the highest level of corruption and the highest level of poverty. These facts are interconnected, according to the regression model; the population of not well-developed countries with Continental social model suffer from the high level of poverty if there is a high level of corruption. Interesting results are demonstrated by the countries of Cont.I model. Corruption index is statistically significant factor for Quintile coefficient, social expenditures, employment level and expenditures on education and R&D. Quintile coefficient shows the stratification of society, and it is expected that the level of corruption is one of the determinants of this stratification. Relations between corruption and employment are also evident: corruption influences possibility of business development, and creates direct relation ships with the level of employment in the country. The most significant effect of corruption from the point of view of social model is on the expenditures on healthcare and education.

Table 3. **Cont.I, regression types**

| | Corruption | | Quintile coef. | | SOC/exp | | R&D/exp | | ED/cap | | EMPL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $R^2$ | Type | $R^2$ | Type | $R^2$ | Type | $R^2$ | Type | $R^2$ | Type | $R^2$ | Type |
| **Netherland** | 0.65 | pol | 0.544 | pol | 0.875 | exp | 0.57 | pol | 0.936 | exp | 0.847 | pol |
| **Germany** | 0.64 | pol | 0.727 | pol | 0.944 | exp | 0.949 | pol | 0.969 | pol | 0.975 | pol |
| **Austria** | 0.94 | pol | 0.445 | power | 0.993 | exp | 0.928 | pol | 0.995 | exp | 0.943 | pol |
| **Czech Rep.** | 0.895 | pol | 0.95 | pol | 0.933 | pol | 0.676 | pol | 0.53 | pol | 0.451 | pol |
| **France** | 0.867 | pol | 0.771 | pol | 0.977 | exp | 0.988 | pol | 0.91 | exp | 0.449 | pol |
| **Poland** | 0.968 | pol | 0.95 | pol | 0.993 | exp | 0.995 | pol | 0.586 | pol | 0.968 | pol |

Table 4. **Cont.II, regression types**

| | Corrupt | | Poverty | |
|---|---|---|---|---|
| | $R^2$ | Type | $R^2$ | Type |
| **Estonia** | 0.506 | pol | 0.563 | pol |
| **Lithuania** | 0.134 | pol | 0.878 | pol |
| **Latvia** | 0.77 | pol | 0.904 | pol |
| **Hungary** | 0.098 | pol | 0.853 | pol |

The research results support the idea that corruption has a negative impact on these spheres, and the adopted social model is important for determining this impact.

**Conclusions and prospects for further research.** The research has shown that countries with different social models present different dependence between corruption and other factors of social system. The importance of corruption for the development of social system is supported by many other researches. The novelty of the research is the division of countries according to adopted social model; the obtained results have supported this approach. The practical implementation of the research results is possible via working out the set of procedures for fighting the corruption according to the social model.

**References:**
*Abed, G., Davoodi, H.* (2000). Corruption, Structural Reforms and Economic Performance in the Transition Economies. Washington: IMF WP No.132.

EuroStat // epp.eurostat.ec.europa.eu.

*Filmer, D., Pritchett, L.* (2001). Estimating Wealth Effect. Demography, 38(1): 115–132.

*Friedrich, C.* (1972). Pathology of Politics, Violence, Betrayal, Corruption, Secrecy and Propaganda. New York: Harper & Row.

*Grekoff, I.* (2013). About Optimal Structure of Government Expenditure // www.goszakazmz.com.

*Gupta, S., Davoodi, H., Tiongson, E.* (2000). Corruption and Provision of Health Care and Education Services. Washington: IMF, WP No.116.

*Gupta, S., Verhoeven, N.* (2006). Public Spending on Health Care and the Poor. Health Economics, Vol. 3.

*Haque, M., Knellar, R.* (2007). Public investment and Growth: The Role of Corruption. CGBR.

*Kaufmann, D., Kraay, A., Mastruzzi, M.* (2003). Governance Matters: Governance Indicators for 1996–2002. World Bank Policy Research Department WP No. 3106.

*Leff, N.H.* (1964). Economic Development through Bureaucratic Corruption. The American Behavioral Scientist, 8 (2): 8–14.

*Mauro, P.* (2002). The Persistence of Corruption and Slow Economic Growth. IMF

*Rogers, M.* (2008). Directly Unproductive Schooling: How Country Characteristics Affect The Impact of Schooling on Growth. European Economic Review, 52: 356–385.

*Rose-Ackerman, S.* (2008). Democracy and 'grand' corruption. International Social Science Journal, 48(149): 365–380.

*Strelchonok, V., Popova, Y.* (2012). Grouping the Human Capital Factors in Social Model. Latvijas Universitates 70. Konferences, Riga: LU.

Transparency International, 2005–2012. Corruption Perception Index // www.transparency.org.

World Bank (2007). Helping Countries Control Corruption. Washington: World Bank.