IDENTIFYING DETERMINANTS OF CORRUPTION IN HEALTH CARE: A CROSS-COUNTRY ANALYSIS

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Submitted to
Department of Economics

In partial fulfillment of the requirements for the degree of Masters of Arts

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Budapest, Hungary – 2009

ABSTRACT

In this thesis I develop a set of hypotheses on the factors affecting corruption in health care. I test my predictions on the basis of European Union countries sample using OLS method. The results suggest that the level of corruption in health care domain is determined by such specific factors as health expenditures, number of hospitals and number of surgical procedures per 100,000; and by general factors such as level of economic and institutional development, unemployment and inflation. I conclude by providing a set of anti-corruption policies and measures on the basis of my findings.

ACKNOWLEDGEMENT

I am heartily thankful to my supervisor, Professor Péter Mihályi, whose professional advice, insightful comments and support from the initial to the final stage enabled me to develop an understanding of the subject. I would also like to show my gratitude to Professor Gábor Kőrösi who helped me with the technical part of my research, and John Harbord for his feedback and suggestions on the structure of this thesis. Moreover, I would like to thank Ramiz, Antonina and Hedvig for interesting discussions and useful hints. I owe my deepest gratitude to my closest friends Anar and Saida for their encouragement, care and for making my life during the last two years so much more exciting. And finally, I would like to thank my dearest mother for her unshakeable belief in me and for always finding the right words to support me.

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INTRODUCTION

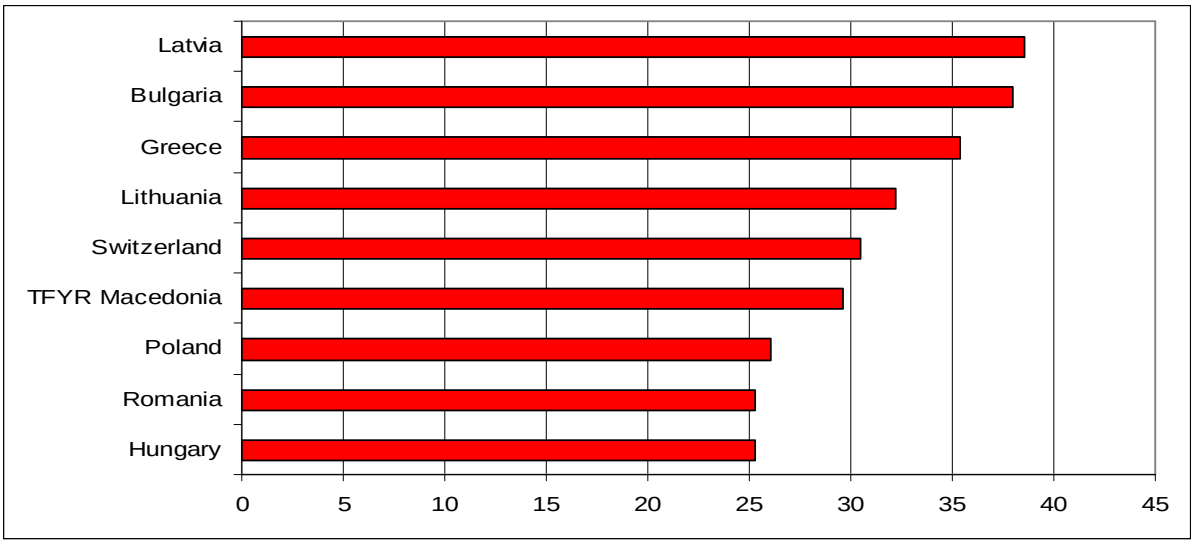
Corruption in the health care domain is a pervasive phenomenon, which results in unmotivated personnel, lack of medical equipment and drugs, low quality of health care services, reduced access to health care facilities, and deteriorated health status in both developing and developed countries. Corruption, defined by Transparency International as ***"the abuse of entrusted power for private gain",*** occurs when public officials possessing the authority misuse public goods or their positions for their own benefit.

According to existent literature, corruption has a negative impact on the provision of medical services through the following channels. First of all, corruption results in increased prices, reduced provision and financing of health care services. Secondly, corruption causes the reduction of investment in human capital (Ehrlich and Lui, 1999), resulting in less competent and demotivated personnel. And finally, it reduces government revenue and as a consequence deteriorates the quality of public services provided (Bearse, Glomm, and Janeba, 2000). Furthermore, according to Gupta and Khaleghian (2004) inadequate quality of publicly provided medical services induces patients to seek health care in private sector, usually characterized by higher prices. Thus, patients lacking financial resources will be more likely deprived of some or the majority of medical services due to their inability to pay. At the same time, in a country with underdeveloped private health care sector there is a risk of increased waiting time, more instances of rent-seeking behaviour, more frequent misuse of authority.

Xu *et al* (2007) state that health care out-of-pocket expenditures by patients include both official and unofficial payments made to public and/or private providers and payments made in case insurance does not cover the cost of services provided.

Both formal and informal out-of-pocket expenditures represent a source of financing not only in transition countries but also in highly developed European Union countries. In contrast to grand corruption cases involving large sums of money, affecting the whole country and causing public scandals petty corruption usually affects individuals and represents an extortion rather than collusion between a doctor and a patient. Despite the existence of quite significant body of research on informal payments in health care domain in EU, the heterogeneous character of the available results and suggestions does not allow to develop adequate policies and measures able to fight corruption in health care in the region.

Figure 1. Private households' out-of-pocket payment on health as % of total health expenditure



Source: World Health Organization, European Health Database

There has been no research performed so far on the determinants of corruption in health care on the cross country level. Thus, the main goal and contribution of this thesis is identification of determinants of corruption in health care. Another contribution of my thesis is that I use as one of the proxies for corruption a variable which was not employed so far in empirical analysis, and namely Euro Health Consumer Index available from Consumer Health Powerhouse. First, I

develop a set of hypothesis on determinants of corruption specific to health care domain. Then, I estimate my model on the basis of European Union countries sample using OLS method.

The rest of the thesis is organized as follows. In the first chapter I discuss the peculiarities of informal payments in health care domain. In the next section I state the hypotheses concerning the potential determinants of corruption in health care. In the third section the empirical results are discussed. Finally conclusions are drawn and policy implications are provided.

CHAPTER 1: PECULIARITIES OF CORRUPTION IN HEALTH CARE

Although corruption as a phenomenon in various spheres of human activity has a lot of common causes and consequences, the characteristics of health care system make the corruption in this domain quite specific. According to Savedoff (former Senior Health Economist at World Health Organization) and Hussmann (consultant at Transparency International) (2006) health care system is prone to corruption due to:

- uncertainty of the demand for healthcare (it is not known in advance who and when will fall ill, what kind of illness person will incur, and what treatment will be efficient in curing the respective illness);
- asymmetric information among participants which results in problems associated with principal-agent relationship;
- great number of participants who interact in a quite complex way.

Uncertainty of demand is a factor which induces corrupt practices among doctors and patients. From this sphere corruption like a viral infection spreads out in other domains affecting numerous participant of health care and creating expectations of bribes. Vian (2008) suggests that as a consequence corruption in health care domain takes various forms: bribery of public officials, regulators, hospital administrators and medical professionals; corruption in purchase, distribution and use of equipment, drugs and other supplies; corruption in construction of health care facilities; corruption in medical research and health care education; corruption in provision of health care services by medical personnel.

Health care system characteristics explaining existence of informal payments are also discussed by Allin, Davaki and Mossialos (2006). They suggest that excess supply of human resources and funds, low pay in the state sector, ineffective

regulation, and lack of transparency make health care domain more corrupt. On the other hand, lack of supply of human resource may also result in bribes as a reduced number of medical personnel might be inclined to provide services only to those patients who are able to pay. Another reason causing corruption is lack of information available to patients, who are sometimes unaware of all the health care services they have the right to receive free of charge.

Similarly, the reasons for corrupt behaviour are discussed by Lewis (2007), who suggests that the main incentives for medical staff to demand under-the-table payment are low or/and irregular payment of salaries and lack of government action in health care system. She states that low pay also represents an incentive for patients to provide under-the-table payments; other reason being cultural tradition of gratitude.

Quite comprehensive synthesis of reasons of corrupt behaviour in health care is provided in the report “Corruption in health sector” by Anti-corruption Resource Center operated by Chr. Michelsen Institute - an independent centre for research on international development and policy. It is stated that medical personnel engages in corruption mainly due to the following reasons:

1. opportunity to engage in corrupt activity due to lack of adequate governance and control, lack of transparency, weak civil rights;

2. environment characterized by tipping traditions, individual and social values;

3. pressure to engage in corrupt behaviour due to low pay, personal debt.

Informal, or the so-called “under-the-table” payments, which are generally defined as payments for services or supplies intended to be free, allow patients to reduce waiting time, obtain certain drugs or specific services, receive a better quality

of health care, secure health care service in the future. A better quality of health care services provided might speak in favour of corruption, as gifts and envelope payments make doctors more attentive to the needs of patients and more willing to provide health care.

The corrupt acts between a doctor and a patient may also be classified as petty corruption. In spite of the fact that sums of money paid might not be very high in an individual case, the total funds diverted as the result of petty corruption may be quite significant. The most affected ones are usually the most vulnerable and poor patients who sacrifice the highest proportion of their income to obtain the basic health care services (United Nations Development Programme, 2008). Unwillingness or inability to provide informal payments might result in denial of access to health care, thus, representing a threat to human socio-economic rights. One of the main problems associated with petty corruption is that bribes are demanded not only from those who are able to pay but also from those who are considered to have no other choice (Anti-Corruption Resource Centre, 2008).

Sometimes there is no clear-cut distinction between a bribe paid to a doctor and a gift or a gratitude payment. Tanzi (1998) argues that a bribe is reciprocal in nature and a gift is not because the recipients of gifts are not obliged to reciprocate. In spite of such a straightforward distinction it is sometimes quite difficult to distinguish between these two phenomena. Even if not asked in advance patients are sometimes willing to provide small gifts to doctors or nurses as a gratitude for their services. Though, this phenomenon seems innocuous it might corrupt honest medical personnel and make patients think that these gifts or gratitude payments are obligatory (Center for Antiwar Action, 2005).

Taxonomy of gratitude payments is provided by Kornai (2000), the renownd Hungarian economist, in his paper *"Hidden in an envelope: gratitude payments to medical doctors in Hungary"*. He suggests that these payments can be classified from the point of view of a patient or "buyer" of heath care services and from the point of view of a doctor or "seller" of the services. Patients may perceive gratitude payments as a voluntary *wage supplement* to doctors, thus, raising their overall income. He draws a parallel between wage supplements and tips to taxi drivers or waiters, indicating that in this case employers set doctors' salaries accordingly. "Buyers" may also view informal payments as *bribes*, which allow them to get a better care, or get care from a particular doctor.

From the point of view of "seller" of health care services gratitude payment may be perceived as a sign of *rent-seeking* behaviour. Kornai identifies rent-seeking behaviour in health care as a provision of services subject to possessing state permit. He suggests that the owner of such a permit adds rent to the official price, later on sharing this additional income with a bureaucrat who issues the permit or using it on his own. Another interpretation of corruption from the point of view of "seller" is the receipt of the so-called *"black" rent*. In this case the service is provided by a doctor with the help of the goods in state possession. All these four forms of gratitude payments described by Kornai have one feature in common: secrecy. Due to the fact that gratitude money is not taxed it is considered illegal. However, it can also be viewed as semi-legal because no laws are applicable in the domain of gratitude payments.

Informal payments can have quite damaging consequences, i.e. loss of citizens' faith in government in general and in health care system in particular, impoverishment of citizens forced to borrow money or sell their belongings to pay for

services, reduced quality of medical services, reduced access to health care services due to inability to provide envelope payments (Vian, 2005). In the absence of adequate regulation patients are often overcharged and are sometimes provided with irrelevant services which may be of no value to them (Savedoff, 2003).

Addressing the same issue, i.e. consequences of informal payments, Gupta *et al* (2000) provide empirical evidence that petty corruption in health care sector has a significant negative impact on such health indicators as infant and child mortality even when controlling for income, female education, health spending, and level of urbanization. Moreover, Azfar and Gurgur (2005) findings suggest that corruption causes reduction in immunization rates, delays newborns vaccination, makes citizens more reluctant to resort to health care in public clinics, and augments waiting time.

Diana Rodriguez, one of the Global Corruption Report 2006 editors, said: "These payments should not necessarily be condemned out of hand. […] In many systems, health workers are so poorly paid that this is the only way they can make a living." Investigation on the private expenditures of physicians in Poland showed that informal payments increased almost twice their average monthly salary (Chawla, 1998). Moreover, in the Czech Republic, Slovakia and Bulgaria medical personnel with the highest salaries and highest family revenue received informal payments more frequently, perhaps as the result of their status and position held (Ensor 2004, Delcheva *et al* 1997). Thus, increasing medical personnel salaries does not necessarily lead to reduction in the level of corruption in health care. For instance, the doctors' salary augmentation in Greece in the early 1980s did not solve the problem of informal payments in health care (Mossialos, Allin and Davaki 2005).

Higher wages may reduce the number of corrupt actions. Yet they may also induce those who are being corrupt to demand higher bribes. Tanzi (1998) argues

that the main reason for this is that while high salaries augment the opportunity cost of losing job, they do not make corrupt officials less voracious. Thus, higher wages are accompanied by decreasing number of corrupt instances, with little negative effect on the level of corruption.

The summary of the major findings on corruption in health care domain is provided in the table below.

Table 1.1. Summary of the main findings on corruption in health care

Main findings	Authors
Reasons for corruption in health care: - uncertainty of the demand for healthcare; - asymmetric information among participants; - great number of participants.	**Savedoff and Hussmann (2006)**
- excess supply of human resources and funds; - low pay in state sector; - ineffective regulation; - lack of transparency.	**Allin, Davaki and Mossialos (2006)**
- low or/and irregular payment of salaries; - lack of government action in health care system; - cultural traditions of gratitude.	**Lewis (2007)**
- opportunity to engage in corrupt activity due to lack of adequate governance and control, lack of transparency, weak civil rights; - environment characterized by tipping traditions, individual and social values; - pressure to engage in corrupt behaviour due to low pay, personal debt.	**"Corruption in health sector" report by Anti-corruption Resource Center operated by Chr. Michelsen Institute (2008)**
Classification of gratitude payments: • from the point of view of a patient or "buyer" of heath care services: - *wage supplement* to doctors, - *bribes* • from the point of view of "seller" or a doctor: - *rent-seeking* behaviour, - *"black" rent*.	**Kornai (2000)**

Results and consequences of informal payments: - loss of citizens faith in government in general and in health care system in particular; - impoverishment of citizens forced to borrow money or sell their belongings to pay for services; - reduced quality of medical services; - reduced access to health care services due to inability to provide envelope payments.	**Vian (2005)**
- increased charges for services; - irrelevant services provided to patients.	**Savedoff (2003)**
- significant negative impact on health indicators: infant and child mortality even when controlling for income, female education, health spending, and level of urbanization.	**Gupta *et al* (2000)**
- reduction in immunization rates; - delay in newborns vaccination; - reluctance of citizens to resort to health care in public clinic; - longer waiting time.	**Azfar and Gurgur (2005)**

Source: developed by author

The secret nature of informal payments and their interpretation which differs from country to country and from culture to culture make it sometimes quite challenging to draw relevant conclusions and to determine the extent of petty corruption in health care. In spite of these difficulties multiple surveys show that informal payments represent rather significant part of out-of-pocket expenditures in many countries. For instance, according to World Bank/USAID survey conducted in 1999 patients in Slovakia provided envelope payments in 71 cases out of 100 when resorting to the services of general practitioners and in 59 cases out of 100 while receiving health care services from specialists (Vagac and Haulikova, 2003). In

Romania informal payments constituted 41 per cent of out-of-pocket expenditures while in Bulgaria – 51 per cent (Belli, 2003).

Thus, the problem of corruption in health care is quite complex and the importance of studying it is indicated by the negative impact it has on health care services provided, on perceptions of doctors and patients and on health indicators. Moreover, spotting factors which contribute to proliferation of corruption in medical sector will make it easier to develop adequate measures and policies able to fight corruption in health care.

CHAPTER 2: IDENTIFYING CAUSES UNDERLYING CORRUPTION IN HEALTH CARE

2.1. Measuring corruption

How can corruption be quantified? In spite of the fact that there are numerous written accounts of corruption it is quite challenging to measure it. A lot of researchers estimated corruption on the basis of micro level data based on firm or household surveys. However, these estimates are of little value for cross-country analysis.

According to Seldadyo and de Haan (2006) corruption can be measured at the macro level on the basis of two main approaches:

1. society or a target group perception of corruption;
2. incidence of corruptive actions or the so-called proxy method.

The first type of corruption estimation reflects the perception of the whole society or of a particular group on the extent of corruption in a country in general or in a certain domain in particular. The second type of corruption estimation is usually based on surveys among potential bribe-payers and bribe-takers. Golden and Picci (2005) suggest the survey method is characterized by several disadvantages. First of all, authors state that respondents involved in corruptive activities are inclined to underreport the level of corruption. Moreover, survey results of those not involved in corruptive activities might be of little value. Secondly, they believe that the measure of corruption perception might become distorted over time, due to the fact that respondents are being influenced by the results of other publicly available surveys on corruption. At the same time, Kaufmann and Kraay (2002b) suggest that in spite of all the disadvantages associated with survey estimations of corruption this method is perfectly suited for cross-country comparisons.

There are several indicators which reflect the level of corruption in health care system available from *Transparency International Global Corruption Barometer 2007 Report:.*

1. perception of corruption in health care domain by the general public (1 – not corrupt at all, 5 – extremely corrupt);
2. percentage of respondents who paid bribes to obtain services in health care, which is measured as a percentage of people who had contact with medical institution in the last 12 months.

Though perception of corruption is a subjective measure of corruption, there is a strong positive correlation between perception of corruption in health care and bribe actually paid. The more often people are faced with corrupt behaviour of doctors and have to provide under-the-table payments for medical services the more corrupt the health care sector is perceived by them (Global Corruption Barometer, 2007).

Another index which can be used as a proxy for corruption is Euro Health Consumer Index available from the official web-site of Consumer Health Powerhouse. According to the *Euro Health Consumer Index Report 2007* the EHCI represents an attempt to measure and rank the health care services from the point of view of consumers. Although, respondents' views are subjective, which might bias results of the analysis, EHCI displays the quality of medical services and can be used to spot the gaps in European health care system, including corruptive practices.

Table 2.1. Correlations among measures of corruption in health care sector

	Bribe paid	Perception of corruption	EHCI	Out-of-pocket expenditures on health care
Bribe paid	1	0.82704	-0.86371	0.53422
Perception of corruption	0.82704	1	-0.85077	0.50308
EHCI	-0.86371	-0.85077	1	-0.57203
Out-of-pocket expenditures on health care	0.53422	0.50308	-0.57203	1

Source: Calculations are made in Excel on the basis of the data from Global Corruption Barometer (Transparency International), Euro Health Consumer Index Report (Health Consumer Powerhouse), European Health Database (World Health Organization).

We can see from the table that there is a strong correlation among various measures of corruption in health care: there is a strong positive correlation between bribe paid for health care services and human perception of corruption in health care domain. The correlation between EHCI and bribe paid, and EHCI and perception of corruption is even stronger.

Summary statistics of the variables used is provided in the Table 2.2.

Table 2.2. Summary statistics of the measures of corruption

	Maximum	Minimum	Mean	Median	Standard deviation	Number of observations
Bribe paid	46	1	14.55	7	15.85	31
Perception of corruption	4.5	2.10	3.08	2.80	0.7002	31
EHCI	806	435	613.65	592	114.99	31
Out-of-pocket expenditures on health care	48.6	6.6	21.25	20.3	10.07535	31

Source: Calculations are made in Excel on the basis of the data from Global Corruption Barometer (Transparency International), Euro Health Consumer Index Report (Health Consumer Powerhouse), European Health Database (World Health Organization).

Latvia's medical sector stands out as the most affected by corruption, as 46 per cent of the respondents claimed paying a bribe for health care. Among the least corrupt countries are Austria, France, Switzerland, Germany and Sweden where patients paid bribes only in 1 per cent of the cases. As to perception of corruption, FYR Macedonia is a definite "leader" as it scored 4.50 out of 5. Finnish people perceive their medical sector to be least corrupt in comparison to patients in other countries (corruption perception index is 2.10). The highest consumer satisfaction coupled with excellent outcomes characterizes the Austrian health care system which is ranked top by Health Consumer Powerhouse. Observing significant discrepancies among the countries as to the level of corruption in health care it would be of value to identify factors which contribute to these differences so as to be able to suggest adequate measures aimed at solving the problem.

2.2. Determinants of corruption

In this section I discuss factors which I hypothesize to affect the level of corruption in health care. I group determinants of corruption in two categories: factors which I expect to affect corruption in a country in general, and specific factors which I expect to have impact on the level of corruption in health care system of a country.

2.2.1. General factors

Level of economic development. Empirical evidence provided by existing literature on determinants of corruption suggests that corruptive practices are usually associated with low economic development (Tanzi, 1998). The shortage of financial resources forces people to look for alternative sources of income which are not always legal. For instance, public servants are put under pressure and often misuse their position and power engaging in rent seeking behaviour, i.e. demanding bribes.

In other words, I presume that there is a higher level of petty corruption in countries with low economic performance.

H1. The lower its GDP per capita, the higher the level of corruption in a country.

Unemployment. Another potential determinant of corruption is unemployment. On the one hand it might seem that higher is the level unemployment in a country, the lower should be the level of corruption, as people losing their jobs do not have financial resources to provide bribes. On the other hand, it is essential to consider the fact that unemployed people might be receiving money from sources other than official employment: they might be supported by their partner or family. Moreover, in many countries in order to receive health care services people have to have insurance, which is paid for by themselves or by their employers. If a patient is unable to get insurance for some reasons he/she will have to provide under-the-table payment to a doctor in order to obtain health care. I arrive at the next hypothesis:

H2. Higher unemployment causes higher level of corruption.

Inflation. Inflation might be another factor explaining level of corruption in a country. High rampant inflation erodes real salaries of employees causing a decline in their real purchasing power. Thus, personnel in health care are seeking for additional sources of income in order to cover the gap resulting from a decline in their real salaries. Moreover, according to Braun and di Tella (2004) high and variable inflation increases uncertainty about future prices and as a consequence increases the cost of monitoring agents' behaviour leading to higher level of corruption.

H3. Higher inflation in a country causes higher level of corruption.

Institutional quality. Corruption might also have its roots in a country's institutions. In this case corruption takes place as people are trying to avoid the

obstacles set by bad institutions (Djankov, 2003). According to Svensson (2005) institutions affect the level of corruption in a country through structural and economic policies chosen by a society.

The choice of proxies for institutional quality is based on the research of La Porta *et al* (1998), who stress the importance of legal origin, latitude and ethnolinguistic fractionalization as determinants of the quality of institutions in a country. These variables may be employed as proxies for institutional quality in a country in general and in health care domain in particular.

La Porta *et al* (1998) suggest that ethnolinguistically fragmented countries are characterized by inferior government performance. Thus, we can expect that higher degree of disparity of interests and values among various ethnic groups in a country will result in less efficient provision of public services.

Another proxy of institutional quality is latitude. According to Landes (1998) countries located in temperate zone, i.e. farther from equator, have more efficient agriculture and a climate more favourable for human health. As the result the economies and institutions of these countries should be more developed.

Legal origin of countries fall into the following categories: socialist law, French civil law, English common law, Scandinavian and German law. La Porta *et al* (1998) argue that the impact of socialist law on government performance and thus on quality of institutions in a country is characterized by the high degree of intervention, reduced efficiency and low degree of democracy. French origin countries are also characterized by quite high interventionism and less efficient than common law countries provision of public goods. In contrast, English common law countries are associated with an intention to limit state intervention, greater protection of private property rights and higher degree of economic and political freedom. They suggest

that German law countries are quite similar to common law countries, while Scandinavian law countries are in contrast more interventional. At the same time the difference between Scandinavian law and common law countries is not as significant as that between civil and common law countries. Higher degree of intervention, ethnolinguistic fragmentation and proximity to equator suggest the existence of less developed institutions, i.e. I expect to find higher level of corruption in socialist origin and civil law countries in comparison to common law countries.

H4. More developed institutions in a country, proxied by ethnolinguistic fragmentation, latitude and legal origin, are associated with lower level of corruption.

Culture and traditions. It is a common fact that cultural values determine norms of behaviour and identify what is good and evil, essential and useless, right and wrong in a society. Prevalence and level of corruption in a country is related to customs and traditions existent in a country, which in turn determine those characteristics, things and conditions that are deemed important by the members of a society. Cultural values affect the establishment and quality of institutions both formal and informal.

As suggested by La Porta *et al* (1998) cultural values can be proxied by religious affiliation: Protestantism, Catholicism and Muslimism. According to Landes (1998) in medieval times Muslim and Catholic countries developed cultures of intolerance and xenophobia. These countries spent quite a lot of resources on banning new ideas, prohibiting learning, censoring books, prosecuting heretics which in turn caused a slow down in their development. It would not be much of exaggeration to say that Muslim and Catholic countries are characterized by high degree of interventionism. La Porta *et al* (1998) state that these is due to the fact that

Catholic and Muslim religious doctrines are quite interventionist themselves. Moreover, they argue that these religions developed to support Church and State power. They suggest that perhaps in the countries where Catholicism and Muslimism are prevalent government performance is less efficient than in largely Protestant countries. Moreover, Catholic and Muslim countries are characterized by less secure property and civil rights and less efficient provision of public good. In contrast, they state that more efficient government, reduced state intervention, better developed and more secure property rights are the main features of Protestant countries. Thus, I expect to find lower level of corruption in health care in countries with larger proportion of Protestants.

H5. A larger proportion of Catholics and Muslims in a country is associated with higher level of corruption.

2.2.2. Specific factors

Health care public expenditures. One of the primary importance determinants of corruption in health care is public expenditure on health. It seems logical that in case of low public health sector expenditures dissatisfied medical personnel will be forced into corruption as an alternative source of income. As public expenditure rise contributing to the development of health care domain it is only natural to presume that medical personnel will have no reasons to engage in corrupt practices.

Thus, I hypothesize that:

H6. Higher public expenditure in health care leads to lower level of corruption.

Number of medical personnel. Another factor which I hypothesize to affect the level of corruption in a country is the number of medical personnel. According to the

model developed by Shleifer and Vishny (1993) in their renowned paper *"Corruption"* the lower is the number of bureaucrats in power the higher bribes they will demand. Drawing a parallel with health care domain we may state that doctors possess a monopolistic power and can limit the provision of health care services to patients who are unable to pay. On the other hand, if the number of doctors is large and patients can choose among doctors, those in need of health care will go to a doctor demanding the lowest bribe or no bribe at all. As the result, competition among doctors will drive the bribe level to zero. My next hypothesis is thus the following:

H7. The larger the number of medical personnel, the lower the level of corruption in health care domain.

Number of surgical procedures. Another potential explanatory factor of corruption in health care is the number of surgical procedures. Every year people undergo millions of unnecessary operations. The stunning fact is that in many countries surgical procedures do not even need to be proven effective in order to be performed. Those who in reality benefit from these redundant operations are doctors generating revenues coming from patients or insurance companies. Moreover, even if there is a need for a surgical procedure doctors can demand any amount of money from a patient who seem to have no choice rather than pay (Natural News, 2004).

Thus, my next hypothesis is the following:

H8. The higher the number of surgical procedures, the higher the level of corruption in health care.

Number of hospitals and number of beds per person. Following the line of reasoning of Shleifer and Vishny (1993) in their article *"Corruption"* we can state that when there is a significant number of hospitals per person in a country, patients can choose among hospitals. If a patient is demanded to provide informal payments for

health care services in one hospital, another hospital can be chosen. In other words, the level of corruption is expected to be lower in a country with a higher number of hospitals per person. The same is valid for the number of beds in a hospital. In case the number of beds is limited doctors can extort bribes from patients seeking to be hospitalized.

H9. The greater the number of hospitals per person in a country, the lower the level of corruption.

H10. The greater is the number of beds per person in a hospital, the lower the level of corruption in health care.

CHAPTER 3: EMPIRICAL ANALYSIS

3.1. Data and methodology

The data which I use for my analysis were obtained from the official sites of Transparency International, World Health Organization, International Monetary Fund, Organisation for Economic Cooperation and Development online database, Health Consumer Powerhouse, and the database used by La Porta *et al* (1998).

Euro Health Consumer Index used in this research deserves more attention and explanation as it is a quite new index which has not been used so far in the empirical estimations. EHCI represents a combination of particular indicators within different health care areas of customer orientation and attitude, as well as variables indicating quality of health care in terms of outcomes. Thus, the index provides insights into how patients in EU member and candidate countries are being served by the health care system. Factors dependent on lifestyles or environment rather than performance of health care system were not taken into consideration, i.e. EHCI does not include such indicators as general life expectancy, diabetes cases, heart disease mortality, etc. These indicators are of little value to patients who worry about the quality of care provided, or who are waiting for a planned operation or are just choosing among health care providers (Health Consumer Powerhouse, 2007).

The ordinary least squares method is chosen in favour of panel data approach due to little variation of variables used. I use average values of most of the variables to eliminate potential fluctuations due to seasonality and/or business cycle. The averages used in the analysis are the average values of variables for the years 2005 – 2007 unless otherwise stated. The sources and detailed description of the variables used are provided in Appendix A.

I suspect that error terms might exhibit heteroskedasticity thus I report heteroscedasticity-consistent standard errors. Another potential problem associated with OLS is multicollinearity, i.e. linear relationship among the right-hand side variables, which will make it difficult to distinguish the individual effect of closely correlated variables. For instance, the determinants of institutional quality are expected to be highly correlated. According to La Porta *et al* (1998) there is a significant correlation among the proportion of various religious groups in a country; religious affiliations are correlated with legal origin of a country; legal origin and religious affiliation are expected to be correlated with the level of per capita income; latitude and logarithm of per capita income are strongly correlated; latitude of a country is also correlated with both ethnolinguistic fractionalization and legal origin. I also believe that the per capita income and health care expenditures might be correlated. Additionally, one cannot expect to obtain meaningful results by including a large number of explanatory variables as there is quite small number of observations. To deal with the above mentioned problems I estimate the effect on the level of corruption in health care of general and specific factors separately. Moreover, I also separately provide the results of the regressions in which only institutional quality proxies are used as determinants of corruption (see Appendix B).

3.2. Empirical results

In this section I present estimation results of the determinants of corruption in health care. Having estimated the effect of institutional quality on the level of corruption (see Appendix B) the following results were obtained. First of all, there is a negative relation between log(GDP) and corruption, as predicted. The log(GDP) variable is statistically significant in all the regressions. Legal origin impacts

corruption the way it was expected, i.e. English common law countries have lower level of corruption in health care. Moreover, as expected socialist legal origin countries are perceived to have more corrupt medical personnel. Estimating the effect of corruption determinants on EHCI showed that, as expected, both English common law and German legal origin countries have fewer incidents of bribes among patients and doctors. Moreover, this is the only regression in which legal origin variables are jointly significant. As to the shares of religious affiliations, only a larger share of Protestants in a country has the expected impact on corruption, i.e. there are fewer incidents of corruptive behaviour in these countries. Additionally, larger proportion of Muslims is associated with higher EHCI. Though, the effect is quite small (1 per cent increase in the proportion of Muslims is associated with a 2.6 point increase in EHCI) the variable is statistically significant at 10 per cent significance level. Positive relationship between proportion of Muslims and EHCI is more likely explained by the sample of countries chosen. It is a common fact that the proportion of Muslims in European Union countries is quite low. Thus, even if there is a large difference in the number of people affiliated to this religion in two different EU countries the predicted negative impact of a larger proportion of Muslims on institutional development and thus on the level of corruption seem to be outweighed by a lower number of Muslims. In none of the regressions religious affiliations are jointly significant. Therefore, they are excluded from further regressions.

Having checked the impact of groups of general and specific factors on the level of corruption and having performed redundant variables test, the set of variables which are to be included in the final regressions was determined: GDP per capita, inflation, unemployment, ethnolinguistic fractionalization, public health expenditures, number of hospitals per 100,000, number of general practitioners per

100,000, number of surgical procedures per 100,000. To detect general functional form misspecification I used the RESET test, which showed the need to include quadratic terms of some of the variables. Thus, the quadratics of log(GDP), unemployment, log(expend), log(surgical) variables were used in regressions as the approximation of non-linear relation with dependent variables.

The estimation outcomes are shown in Table 3.1. The main regressions are those with bribe paid and EHCI as dependent variables. A glance at the table suggests that the factor which has the highest impact on bribe paid is the number of surgical procedures (see column 1). The coefficient on surgical procedures is statistically significant at 1 per cent confidence level and shows that 1 per cent increase in the number of operations increases level of corruption by 3.52 per cent. Another significant determinant of corruption is public expenditure on health care which results in fewer bribes being paid: 1 per cent increase in expenditures leads to a 1.78 per cent reduction in bribes paid to doctors. As shown by the results obtained the effect of public spending on the bribe paid is non-linear, meaning that higher expenditure on health care contributes to fewer incidents of corruption in health care up to the turning point, which is, however, out of the feasibility range.

As predicted a higher level of economic development in a country proxied by GDP per capita leads to a lower proportion of population paying bribes to obtain health care services: 1 per cent increase in GDP per capita leads to a 1.92 per cent drop in bribes paid. Moreover, inflation, as predicted, leads to higher level of corruption, and the variable is significant at 10 per cent significance level.

Table 3.1. Estimation results

	Bribe paid	Corruption perception index	EHCI	Out-of-pocket expenditures
	1	2	3	4
C	-761.6376 (702.3573)	17.84830 (32.40947)	-460.953 (516.0444)	-554.4238 (713.7747)
Log(GDP)	**-192.2929** (81.64913)**	-3.524717 (4.385187)	**96.6547 * (56.2953)**	116.5883 (84.84752)
Log(GDP)^2	**9.156672** (3.995184)**	0.141731 (0.215370)	-4.69261 (2.9511)	-6.051768 (4.139324)
Unemployment	2.539724 (1.563103)	0.045355 (0.060394)	**-15.83554 * (9.289076)**	-0.230883 (1.145726)
Unemployment^2	**-0.067264*** (0.035236)**	-0.001544 (0.001452)	**0.565801 *** (0.187628)**	0.019806 (0.029839)
Inflation	**1.863100 * (0.556950)**	0.027089 (0.038853)	**-9.754355 * (5.179705)**	**1.998251** (0.825014)**
Ethnolinguistic fractionalization	-1.932565 (14.76470)	-0.757278 (0.875697)	-35.83917 (98.81807)	**27.02245 * (1.734267)**
Log(expend)	**-178.3787** (81.78778)**	**-7.339995** (3.368146)**	**196.576*** (53.3400)**	-75.56839 (15.58149)
Log(expend)^2	**43.01585** (19.83407)**	**1.780681** (0.801531)**	**-48.8140*** (12.7424)**	18.41798 (20.73444)
Log(hospitals)	-0.731104 (2.957494)	-0.113059 (0.165339)	**90.46235*** (34.14250)**	**-12.86626 ** (5.763660)**
Log(gen_pract)	-3.407585 (4.341402)	-0.000365 (0.166392)	81.79810 (75.00965)	12.87458 (7.891718)
Log(surgical)	**352.4860*** (177.5250)**	0.490992 (7.013861)	-179.0531 (960.6104)	9.293518 (156.2565)
Log(surgical)^2	**-19.50512*** (9.901531)**	-0.037658 (0.388757)	8.354862 (52.91779)	-0.094170 (8.667238)
R-squared	0.850390	0.841935	0.880518	0.653265
Number of observation	31	31	31	31

Note: 1. ***, **, *- the coefficient is statistically significant at 1, 5, 10 % significance level respectively.
2. Heteroscedasticity-consistent standard errors are reported.

Identifying the impact of potential determinants of corruption on our goal function EHCI shows quite similar results (see column 3). However, in this case public health spending has the largest impact on the dependent variable. The coefficient on surgical procedures becomes insignificant. At the same time, another two explanatory variables have a significant impact on our goal function: unemployment and number of hospitals per 100,000 persons. The estimation results

obtained show that a 10 per cent increase in the number of hospitals per 100,000 reduces the level of EHCI by 9 per cent. As predicted higher level of unemployment in a country is associated with higher level of corruption.

To check for robustness I also show the estimation results using perception of corruption index and health out-of-pocket expenditures as dependent variables. I believe that the results obtained are not very meaningful mainly due to multicollinearity.

The research performed has its weaknesses. First of all, the size of the sample is quite small for robust conclusions. Moreover, I suspect that there is a possibility of omitted variables and measurement error bias. Additionally, in the absence of adequate instrumental variables there exists a possibility of endogeneity. However, in spite of these limitations I identified factors which have an impact on the level of corruption in health care, namely GDP per capita, institutional quality, unemployment, inflation, public expenditures on health care, number of hospitals per 100,000 and number of surgical procedures per 100,000. In the next chapter I provide a set of anti-corruption policies on the basis of my findings.

CHAPTER 4: POLICY IMPLICATIONS

Informal payments in European health care sector are more widespread than it is generally believed. The anti-corruption measures taken so far produced different results in different countries and not all the approaches have been tested to estimate their effectiveness. The disparities in the outcomes and in the degree of effectiveness are determined by economic conditions, historical development, cultural values and religious affiliations, etc. In other words, any measures and policies aimed at combating corruption in health care sector are to be developed and implemented with an eye to peculiarities of a country.

The empirical results that I obtained stress the importance of public health care expenditures as an anti-corruption measure in health care. However, higher public spending on health care would not reduce the level of corruption in the sector in case resources are being diverted. Several previous studies on the effect of expenditures on corruption in health care obtained mixed results. I believe that one of the explanations of the insignificant relationship between health care spending and level of corruption might be the fund leakage. More likely the results which I obtained, showing the significance of health spending for fighting corruption are explained by the choice of the sample of countries: it seems reasonable to expect European Union countries to be more efficient in funds utilization.

I suggest that in order to guarantee the efficient public spending and absence of funds leakages authorities apply one or a set of the following policy measures ensuring at the same time that these actions are being adapted to the local conditions of a particular country. First of all, it is essential to develop adequate control and apply transparent accounting procedures, which will allow more efficient enforcement of rules and penalties in case of improper use of funds. Moreover, I

believe that developing effective auditing procedures will ensure adequate fiscal oversight.

Another measure aimed at improving allocation of funds is privatization of health care sector. Gray-Molina *et al* (2001) found a lower level of informal payments in one municipal hospital in Bolivia in presence of alternative providers. A reduced level of corruption is more likely explained by the existence of competition between public and private providers dependent on income from user fees. At the same time effective privatization of health care sector would require governmental authorities to develop adequate supervision system to ensure high standards and reliability of health care services provided, non-exclusion of patients in case of inability to pay, and impose sanctions in case of malpractice (Anti-corruption Resource Center, 2008).

Furthermore, to measure the amount of funds being diverted and thus to solve or at least mitigate the problem of funds leakage governmental authorities can use Quantitative Service Delivery Surveys and/or Public Expenditure Tracking Surveys (PETS). QSDS allows measuring the efficiency of funds utilization. PETS are used to track the differences between the actual spending in health care and the allocated funds. At the same time, the PETS methodology helps measuring corruption by identifying the organizational levels of corruption occurrence (Amin *et al*, 2008). Tracking the flow of funds governmental authorities will be able to focus on those areas or authority levels at which funds are more likely to be diverted. Thus, it would be easier to ensure the proper allocation of budget resources.

Ensuring public access to the information on funds allocation and/or misallocation is another measure, which I suggest to be used to fight corruption in health care. Information campaigns make it possible to increase public awareness of

corrupt practices and show households how to report them. For instance, authorities in Uganda were able to reduce the budget allocations leakages by 78 per cent just by publishing the report on intergovernmental funds transfer on a monthly basis (Reinikka and Svensson, 2005).

As shown by the estimation results which I obtained in this paper the number of hospitals per person also has a significant impact on the percentage of patients paying bribes to doctors. Therefore, I suggest more resources be devoted to building new hospitals, which are accessible and affordable to those in need of health care, though, just increasing the number of hospitals in a country or a region would probably not be enough to fight corruption in health care. It is also essential to control flow of resources within a hospital and to develop procedures ensuring equitable and qualitative treatment of patients. For instance, as a mean of controlling the flow of user fees a network of electronic cash registers was installed in one of the Kenyan municipal hospitals. The costs of the reform were estimated at $42,000 while income from user fees increased by 50 per cent just in 3 months and by 400 per cent in 3 years without any change in the level of utilization rates. Another practice aimed at reducing the number of bribes paid to doctors in hospitals was adopted in Croatia, where health ministry made it compulsory for hospital executives to publish waiting lists. This measure resulted in more transparent, less corrupt and accessible health care services.

Another health care specific indicator which I identified as a determinant of the level of corruption in health care is the number of surgical procedures. Therefore, I suggest that in order to reduce the number of bribes paid by patients to doctors it is essential to reduce the number of unnecessary surgical procedures. Ensuring that a patient is being examined by an independent doctor before the surgery is actually

performed might diminish the number of redundant surgical interventions. Making screening and regular checks mandatory for groups prone to risk of a particular disease is another measure of malady prevention and number of unnecessary surgeries reduction.

The anti-corruption measures which I mentioned above are just a few possibilities of reducing the level of corruption in health care domain. However, applying these measures in isolation will more likely not suffice for significant improvement of the situation. The results which I obtained show the importance of institutional quality for reduction of corruption in health care. In other words, to ensure that specific policies aimed at curbing corruption in health care are efficient governmental actions should be directed at the development of adequate institutional framework in a society which will represent a foundation for promoting transparency, rule of law, simple and effective accountability and sanction procedures not only in health care domain but also in general, on the level of a country.

According to the “Handbook on fighting corruption” published by the Center for Democracy and Governance in 1999 reforms aimed at improving institutional quality in a country should focus on limiting the level of government intervention in economic activity, improve accountability, modify incentives of public officials.

To limit governmental intervention the following measures might be applied: privatization of state property, liberalization of trade, promotion of competition among public agencies. Privatization of state property in different sectors of a country results in reduction of corruptive instances and improves economic efficiency by providing private sector with more decision-making power. However, governmental authorities should ensure adequate supervision and regulation to make privatization process efficient. Liberalization not only deprives authorities of the possibilities of corrupt

behaviour by eliminating tariff barriers, quotas and licenses, but also improves competition among businesses in a country promoting economic development. Fostering competition among public agencies will reduce the level of corruption due to businesses ability to choose among agencies/jurisdictions and move their activity to less corrupt regions.

I believe that institutional reforms aimed at improving accountability of public officials should focus on increasing transparency and developing adequate enforcement mechanisms. To improve accountability it is essential to ensure public access to information on the functioning of governmental agencies: publish laws, regulations and procedures; disclose the uses of public funds; establish adequate supervisory agencies possessing authority to impose sanctions; promote judicial reforms and develop relevant legislation.

To reduce corruption on institutional level it is also necessary to curb perverse incentives of public officials. Incentives can be improved by developing code of ethics and ensuring adequate hierarchal structure within public agencies through elimination of redundant positions and clearly defined responsibilities. Moreover, public officials can be motivated with the help of adequate salaries, bonuses and other perks linked to performance.

As proved by the results obtained in this paper cultural values in a society represent another determining factor of corruption. In other words, promoting non-tipping culture will result in lower levels of corruption in a country in general and in health sector in particular. Reforms aimed at changing societal attitude towards corrupt actions should increase public awareness of corruption implications and its costs, clearly showing that short-term benefits obtained due to a bribe paid are outweighed by long-term social losses. Promotion of public awareness can be

performed with the help of mass media, which can be used to show the long-term negative impact of corruption on a country economic development: reduced investments, lower expenditures on health care, reduced tax revenue (Tanzi, 1998). These anti-corruption campaigns should also stress citizens' right for public services and their ability to report corrupt actions. At the same time, an efficient anti-corruption campaign performed through media requires both a free mass media and well-trained and professional journalists.

Another two macroeconomic indicators which I determined to have impact on the number of bribes paid to obtain health care are unemployment and inflation. Demand side policies aimed at controlling inflation are monetary and fiscal policies. Setting higher interest rates makes borrowing more costly, thus, reducing growth of aggregate demand in a country, which results in lower inflation. Higher taxes and lower government spending have the same impact on the level of inflation. Supply side policies are mainly used to reduce level of inflation in the long run and are designed to improve the overall effectiveness of an economy.

In case of unemployment there is a tradeoff between society's welfare and individual well-being. I must point out that even in spite of the fact that overall society is better off in the presence of natural level of unemployment which makes households and businesses more efficient, unemployed individuals are worse off being deprived of access to basic public services. The empirical results which I obtained show that to reduce the level of corruptive actions among doctors and patients government should also apply measures designed to reduce level of unemployment in a country. The range of policies and measures able to increase level of employment is quite broad: ensuring stable economic development and adequate monetary policy; providing incentives to unemployed to find job by limiting

duration and reducing level of unemployment compensation packages and by promoting active labor market policies; promoting life-long learning so as to guarantee match between the qualifications demanded and supplied on the labor market; adopting laws which will make it difficult and costly to lay off employees (FED, 1994).

It is obvious that applying *all* the mentioned measures is redundant and probably inefficient. However, designing adequate set adapted to local realities, and using each measure at the clearly determined and justified moment of time will bring significant improvements and result in lower levels of corruption in health care domain.

CONCLUSION

The main goal of this thesis was to identify factors which have impact on the level of corruption in health care. The empirical analysis that I performed showed that corruption in medical sector is dependent on the general level of institutional and economic development of a country, and such general macroeconomic factors as inflation and unemployment. Moreover, such specific factors as public health expenditures, number of hospitals and number of surgical procedures per person also have impact on the level of corruption in health care domain.

Even taking into consideration all the limitations of the empirical research performed and econometric method chosen it is still possible to draw conclusions and suggest relevant policy measures aimed at fighting corruptive actions among doctors and patients. To be effective measures aimed at curbing corruption in health care should be systematic, based on theory, existent empirical evidence and local realities, and designed to curb corruption not only in medical sector in particular but also in country in general.

APPENDICES

Appendix A

Detailed description and sources of variables

Variable	Description	Source	Years
Bribe paid	The percentage of respondents who paid bribe to obtain health care service	Transparency International	Average 2005 -2007
Perception of corruption	The percentage of respondents reporting health care sector to be corrupt (1:not at all corrupt, 5: extremely corrupt)	Transparency International	Average 2005-2007
Euro Health Consumer Index	Ranking of health care systems according to - patient rights and information; - waiting time for treatment; - outcomes; - "generosity"; - pharmaceuticals.	Health Consumer Powerhouse	2007
Private households' out-of-pocket payment on health as % of total health expenditure	Private households' out-of-pocket payment on health are the direct outlays of households, including gratuities and payments in-kind made to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services, whose primary intent is to contribute to the restoration or to the enhancement of the health status of individuals or population groups	World Health Organization	Average 2003-2005
Gross Domestic Product per capita	Gross Domestic Product expressed in U.S. dollars per person, constant prices	International Monetary Fund	Average 2005-2007
Latitude	The absolute value of the latitude of the	La Porta *et al*	-

	country, scaled to take values between 0 and 1.		
Ethnolinguistic fractionalization	Average value of five different indices of ethnolinguistic fractionalization. The value ranges from 0 to 1.	La Porta *et al*	-
Legal origin (French, English, German,Socialist, Scandinavian – base group)	Categorizes legal origin of the Company Law or Commercial Code of a country.	La Porta *et al*	-
Religious affiliation (Catholics, Muslims, Protestants)	The percentage of the population of each country that belonged to the three most widely spread religions in the world in 1980 (scale from 0 to 100).	La Porta *et al*	-
Unemployment	The percentage of total labour force comprising all persons above a specified age who during the reference period were: without job, currently available for work or seeking job.	World Health Organization	Average 2005-2007
Inflation	Annual average rate of inflation (%)	World Health Organization	Average 2005-2007
Health expenditures	Total health expenditure as % of gross domestic product (GDP)	World Health Organization	Average 2005-2007
Number of hospitals	Number of hospitals per 100,000	World Health Organization	Average 2005-2007
Number of hospital beds	Number of hospital beds per 100,000	World Health Organization	Average 2005-2007
Number of surgical procedures	Number of surgical procedures per 100,000	Organization for Economic Co-operation and Development	Average 2005-2007
Number of general practitioners	Number of general practitioners per 100,000	World Health Organization	Average 2005-2007

Appendix B

Estimations results: impact of institutional quality on the level of corruption in health care (a)

	Dependent variable					
	Bribe paid			Perception of corruption		
	1	2	3	1	2	3
C	**167.5423*** (17.50615)**	**126.7157*** (35.88000)**	**134.1319*** (34.01227)**	**10.36320*** (0.708648)**	**7.072491*** (1.451227)**	**9.067592*** (1.384330)**
Log(GDP)	**-15.44401*** (2.196993)**	**-10.95240*** (4.171516)**	**-12.34318*** (3.188300)**	**-0.666259*** (0.082459)**	**-0.290107 * (0.170516)**	**-0.583716*** (0.126546)**
Latitude	4.415613 (25.23208)	-8.046218 (39.26125)	28.56835 (29.33383)	-0.868791 (0.921105)	-2.101363 (1.464741)	0.434120 (0.971424)
Ethnolinguistic fractionalization	-9.683336 (15.10787)	-12.99239 (15.56213)	-18.30603 (14.69699)	**-1.318600** (0.536989)**	**-1.579669 *** (0.580069)**	**-1.587882*** (0.564048)**
French		1.422766 (6.787846)			0.035817 (0.282644)	
German		-2.918351 (5.602204)			-0.146009 (0.245264)	
Socialist		8.008129 (7.895548)			**0.645821 ** (0.313102)**	
English		-1.013496 (5.459791)			-0.117905 (0.240815)	
Catholics			-0.108859 (0.075848)			-0.001329 (0.002980)
Muslims			-0.155190 (0.235598)			-0.001241 (0.009637)
Protestants			**-0.209388 * (0.112438)**			-0.006897 (0.004810)
R-squared	0.689509	0.706199	0.735273	0.778605	0.826069	0.807995

Estimations results: impact of institutional quality on the level of corruption in health care (b)

	Dependent variable					
	EHCI			Out-of-pocket expenditures		
	1	2	3	1	2	3
C	**-507.9398 *** (16.65978)**	-9.479121 (198.3176)	-288.3352 (223.7366)	**89.00566*** (14.49075)**	**153.0886*** (31.73570)**	**84.61192*** (20.77121)**
Log(GDP)	**105.2572*** (16.65978)**	**50.43162** (21.09331)**	**89.12404*** (19.53369)**	**-5.978452*** (1.831893)**	**-11.56159*** (3.511308)**	**-4.244665 * (2.449398)**
Latitude	106.7084 (123.9791)	257.7636 (231.9117)	-130.8448 (149.5879)	-18.73290 (23.20518)	-19.50585 (35.89228)	-32.19702 (29.33530)
Ethnolinguistic fractionalization	-103.9118 (99.73169)	**-182.7049** (91.02141)**	-156.7800 (111.8589)	18.15227 (18.66416)	22.80553 (15.53011)	15.08216 (18.17451)
French		-13.89418 (58.07526)			-8.666001 (6.677305)	
German		**90.59771** (41.98707)**			-2.220581 (6.626029)	
Socialist		**-99.87419** (41.64681)**			**14.61001** (5.907109)**	
English		**86.66766** (41.08909)**			-0.638181 (6.970282)	
Catholics			0.515169 (0.345546)			-0.103475 (0.069673)
Muslims			**2.616304 * (1.577512)**			0.025352 (0.372230)
Protestants			**1.687224*** (0.621686)**			-0.025617 (0.092739)
R-squared	0.666700	0.808962	0.738838	0.339116	0.463258	0.449841

Appendix C

Expected and actual effect of determinants of corruption on bribe paid, perception of corruption, out-of-pocket expenditures

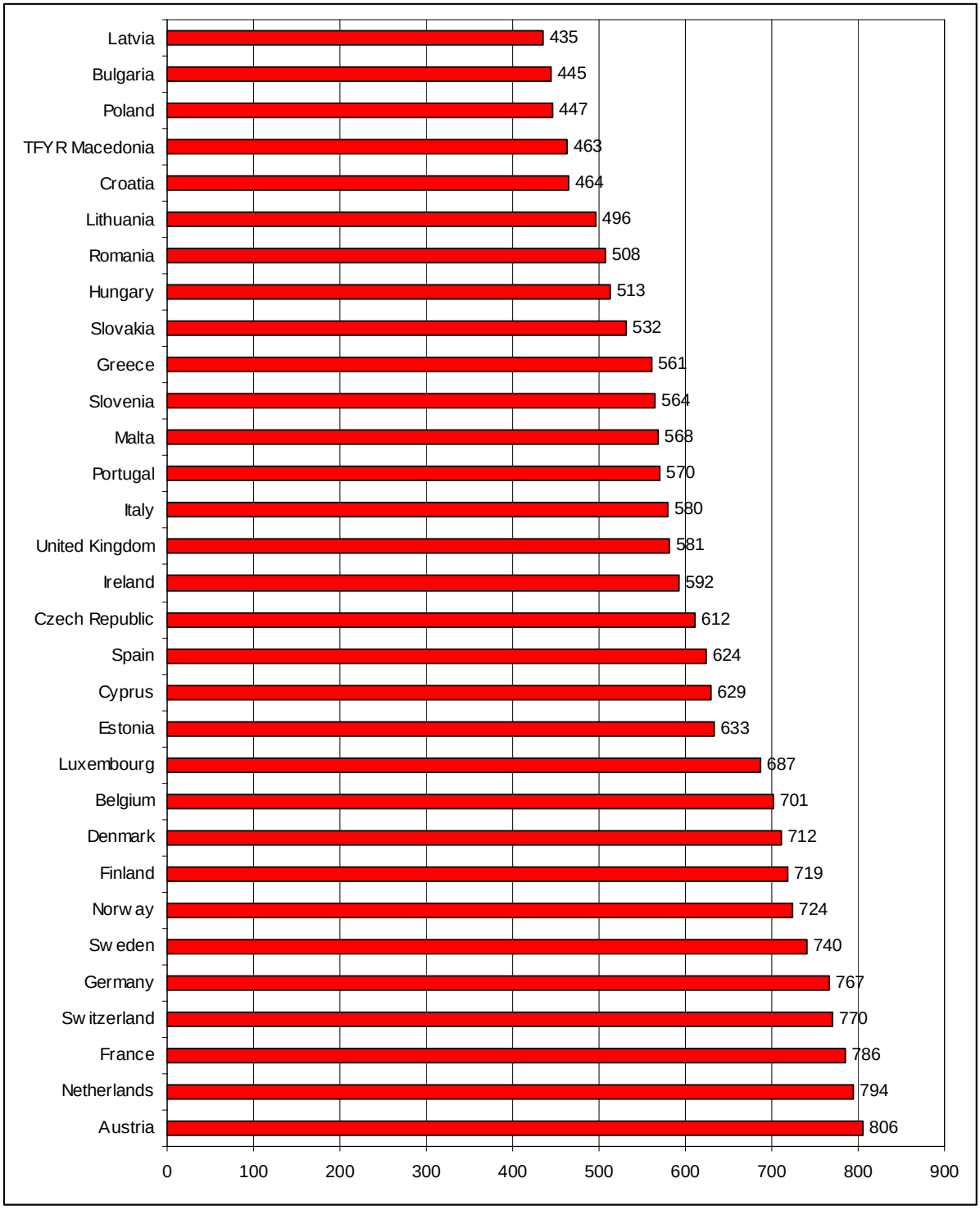
Variable	Expected effect	Actual affect
Gross Domestic Product per capita	-	-
Latitude	-	(+/-)
Ethnolinguistic fractionalization	+	(+/-)
Legal origin:		
- **French**	+	(+/-)
- **English**	-	(-)
- **German**	-	(-)
- **Socialist**	+	+
Religious affiliation:		
- **Catholics**	+	(-)
- **Muslims**	+	(+/-)
- **Protestants**	-	-
Unemployment	+	(+/-)
Inflation	+	+
Health expenditures	-	-
Number of hospitals	-	-
Number of hospital beds	-	(-)
Number of surgical procedures	+	+
Number of general practitioners	-	(+/-)

Expected and actual effect of determinants of corruption on Euro Health Consumer Index

Variable	Expected effect	Actual affect
Gross Domestic Product per capita	+	+
Latitude	+	(+/-)
Ethnolinguistic fractionalization	-	(-)
Legal origin:		
- **French**	-	(-)
- **English**	+	+
- **German**	+	+
- **Socialist**	-	-
Religious affiliation:		
- **Catholics**	-	(+)
- **Muslims**	-	+
- **Protestants**	+	+
Unemployment	-	-
Inflation	-	-
Health expenditures	+	+
Number of hospitals	+	+
Number of hospital beds	+	(+)
Number of surgical procedures	-	(-)
Number of general practitioners	+	(+)

Appendix D

Euro Health Consumer Index 2007



Source: Euro Health Consumer Index 2007 Report

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