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Abstract. This article looks at the impact of World Bank funding on health care sector performance in Central and Eastern European countries. The World Bank has been one of few organizations involved in health care sector assistance in these nations during the transition period, mainly through funds disbursement. This article tests hypotheses that those countries that perform better economically, that are more favorably evaluated by the World Bank, and that have more effective institutions are also more likely to benefit from World Bank assistance, through improvements in the performance of their health care sectors.

Keywords: • Health care • World Bank • International institutions

In the past 17 years of the dual transition undertaken by the Central and Eastern European Countries (CEECs), most of the attention in the economic transition has been paid to the processes of price liberalization, macroeconomic stabilization, and privatization. This agenda was led by international organizations such as the International Monetary Fund (IMF) and the World Bank,[1] supporters of rapid economic reforms in the post-communist countries (Deacon and Hulse, 1997). In the research community, most deliberations have been between the advocates of fast versus gradual reforms, and partial versus complete privatization. The social welfare consequences of the transition process have been largely ignored, until recently, when the deteriorating public health conditions in these countries began to draw the attention of the same international organizations and a few regional specialists to this issue (among them Brainerd and Cutler, 2006; Davis, 2000; Ensor, 2004; Kornai, 2001; Lewis, 2000). Some of the countries of Central and Eastern Europe (CEE) have improved their health care sector performance[2] more than others, as evidenced by less drastic declines in life expectancy and improvements in other measurements of health care sector performance.[3] The question that this article seeks to answer is why this should be so.

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This article approaches the question of why some CEECs were more successful at improving their health care sector performance than others by looking at the impact of World Bank funding on health care sector performance on cancer mortality rates, taking into account other factors thought to be important, such as reform progress. Given that the World Bank has been the only agency to make significant financial and technical assistance contributions to the health care sector and the failure of Central and Eastern European governments to improve the performance of the health care sector on their own, it is important to study the role of World Bank support in this domain. Furthermore, finding an answer to this question will give some indication of the influence that international organizations may (or may not) have on domestic policy-making in economic sectors that are politically charged and thus harder for domestic governments to address. The case of the World Bank is particularly relevant because of the extensive involvement the bank has had in the economic reforms undertaken by CEECs.

In addition to studying the impact of World Bank funding, this article also puts forth the idea that health care sector performance is influenced by economic performance and by the institutional effectiveness of the country in question. I hypothesize that the more financial support is given by the World Bank, the better equipped the country is to implement reforms in these domains. At the same time, the willingness of the World Bank to provide support depends on the agency's evaluation of the country's success at implementing first-wave reforms such as macroeconomic stabilization and privatization. Thus, I test whether a country that implemented its macro-stabilization reforms rapidly and successfully and therefore had good economic performance is more likely to receive World Bank support in a larger amount and whether the aid improves the performance of the health care sector. Finally, I test whether the impact of the World Bank's support for the health care sector could be either promoted or inhibited by the institutional effectiveness of the country. While effective institutions, which make the process transparent, increase the effect of World Bank support by allocating funds appropriately, ineffective institutions could inhibit the process by permitting the misallocation of funds, to the point that some of them never serve their initial purpose.

Health Care Sector Performance

During the economic downturn of the transition period, evidence of a decaying health care sector is seen in the CEE in dramatic drops in life expectancy, especially for middle-aged males. In Russia, life expectancy at birth for men dropped to 57.5 years by 1994 (World Bank, 2005). According to a panel of Russian demographers, men in Russia live 15–17 years less long than men in Western Europe, while women live 7–10 years less long (Belli, 2001). Infant mortality also increased to 20 per 1000 by 1998, which is several times higher than infant mortality in developed countries (Belli, 2001). The high mortality rates, incidence of diseases, and suicide rates are a reflection of the fact that the health care sector in the Russian Federation has not improved significantly to deal with the health consequences of the transition. What factors account for such a drop in health conditions?

There is an extensive literature describing the factors affecting health care system performance that fall under the umbrella of domestic policy-making. Health care system performance, which is the ability of the health care service to offset the negative effects of illness (Davis, 2001), can be affected by factors

attributable directly to the health care sector, but also to other factors outside the health care sector. The most important factors in the first group are health care spending (public and private as a percentage of GDP), equity of provision and access for vulnerable sections of the population (the unemployed and disabled), and efficiency in terms of the use of resources and delivery of care (Coyne et al., 2002; W.C. Hsiao, 2003; Kornai and Eggleston, 2001; Whitehead, 1999; World Health Organization, 2000). These factors are determined primarily by the policy-making process creating such structures. In the CEECs, Marxist–Leninist philosophy determined the structure and role of the health care sector in the economy. Low levels of health care spending reflected the low priority awarded to that sector as compared to others, such as heavy metallurgy (Davis, 2000). Though regime types have changed (at least formally) in almost all CEECs, policy-making in the health care sector has been slow to adapt to the new values, as will be discussed in the following section.

Non-medical factors negatively affecting health care sector performance come from environmental sources such as pollution, unhealthy lifestyle choices (tobacco, drug, and alcohol abuse), genetics, suicide rates, and other factors (Brainerd and Cutler, 2006; Feshbach and Friendly, 1992). During the transition and post-transition period, there has been a sharp increase in the incidence of both communicable diseases that had previously been successfully controlled and non-communicable diseases, as well as increases in HIV/AIDS and other sexually transmitted diseases. Higher rates of syphilis incidence have been noted in the Russian Federation and Bulgaria and the spread of diphtheria in the Russian Federation has been so large that UNICEF (1999) defines it as being of epidemic proportions. The increase in non-communicable diseases such as cardiovascular illness and cancer has been attributed to changes in lifestyle such as increasing alcohol and tobacco consumption and poorer nutrition, factors associated with the stress of daily life in a decaying economy in which double-digit unemployment has been the norm. Between 1990 and 1995, 48.9 percent of total deaths were due to circulatory disease, while 26 percent were due to accidents and injuries (Brainerd, 2001).

Theoretically, the impact of the World Bank could occur directly through targeted health care sector loans or indirectly through the imposition of austerity measures as conditions attached to those same loans, as is described in the following section.

The World Bank and Health Care

This section develops a theoretical framework to assess the impact of World Bank funding on the performance of health care sectors in Central and Eastern European countries. Although some authors have sought to examine the process and impact of international organization lending on the transitional economies, as well as the impact of the transition on the health care sector of these economies (Brainerd and Cutler, 2006; Davis, 2001; Ensor, 2004; Howell, 1998; Kornai, 2000; Kornai and Eggleston, 2001; Zecchini, 1995), and others have looked at the formation of new cross-country task forces (such as the Baltic Sea task force) that were formed to deal with the decline of health standards in the CEECs and the re-emergence of old and emergence of new infectious diseases since the early 1990s (Hønneland and Rowe, 2004, 2005; Rowe and Rechel, 2006), overall the literature describing the impact of international organizations on health care

reforms is scarce in general, and almost non-existent with regards to transitional economies.

This neglect is partly because the only international organization that has contributed significantly to health care reforms in the Central and Eastern European region, the Word Bank, did not begin its lending program for the health care sector until the 1990s. The limited attention paid by the international organizations to the health sector in the early transition years is itself attributable in part to the lack of knowledge about the social costs of economic transitions. Furthermore, because health care systems vary so widely even among wealthy nations, there is no blueprint for a successful reform plan worth undertaking (Nelson, 2001). However, as life expectancy in the CEECs began declining rapidly, especially in Russia, the public outcry for health care sector changes compelled governments and international agencies to move health care reform higher on the priority list.

Furthermore, the World Bank itself has been more aggressive in its participation in other social reforms, such as the pension system in Poland, and has been comparatively shy in its assistance to the health care sector (Nelson, 2001). In the period between 1990 and 1993, the share of World Bank lending dedicated to the health care sector was only 3 percent (twelfth in order of size of World Bank sector loans), and this measure included financing for nutrition and population sectors as well (Wallich, 1995). Nelson (2001) identifies a few reasons for such behavior. While reform of the pension system had clear examples, such as affluent western countries, to model their systems after, the health care sectors of affluent countries vary significantly, and there is no consensus on a strategy for reform of the health care sector. Thus, the first reason for the lack of participation of the World Bank was a lack of knowledge, plus lack of consensus within this organization, regarding what model health care reform should follow. Second, political disagreements and conflicts of interest tend to be more frequent when it comes to health care issues.[4] Coupled with the greater complexity of reforming a health care system (as opposed to a pension system), the International Bank for Reconstruction and Development (IBRD) chose not to get involved in reforms where success was not foreseeable.

Brada et al. (1995), Wallich (1995), and Zecchini (1995), among others, analyze the factors the World Bank takes into consideration when the organization decides to give support to countries to improve their health care sector performance. The process starts with the country requesting the needed assistance from the World Bank. Typically, countries have refrained from requesting assistance from the World Bank for health care sector reform in the form of sector adjustment loans (SECALS). They have preferred to borrow for more traditional investments such as infrastructure development. The key factor in the decision on whether to borrow for social sector reforms has been the "economic efficiency of the investment" or economic returns (Wallich, 1995: 74). Health care reform projects do not yield direct financial returns.[5] In addition, it is harder to repay loans that do not yield direct financial return in terms of growth in income. Accordingly, a number of loans the World Bank secured for the purpose of the health care sector were mixed loans where a portion of the fund was given for the purpose of some macroeconomic stabilization or infrastructure growth, rather than sector reform loans where 100 percent of the funding was dedicated to the health sector reform. When evaluating the request of a country for a loan, the World Bank

uses data collected from the International Development Agency (IDA) Country Performance ratings, whereby the agency evaluates the country by a number of different factors. These ratings are based upon the Country Policy and Institutional Assessment (CPIA) questionnaire, which includes evaluations of the following areas: economic management, structural policies, policies for social inclusion or equity, and public sector management and institutions. Knowing the ability of a country to implement the economic and social policies that promote growth and poverty reduction gives the World Bank an assessment of the integration of aid into macroeconomic stabilization efforts already under way (Howell, 1998; Wallich, 1995). Since it is known that the impact of assistance on reforms and sector problems is most effective in countries that advance most rapidly in the economic transformations, the requests for assistance are screened selectively (Zecchini, 1995). This necessarily implies that countries that have achieved GDP growth and lowered inflation and unemployment are more likely to receive World Bank support. Such an evaluation process does not come as a surprise: the IBRD is a bank and behaves so as to maximize its investment returns. Thus, where growth and reforms are not advancing rapidly, World Bank funding may be very limited.

This finding goes hand in hand with the literature on shock-therapy reforms. The main promoters of the radical reforms of macroeconomic stabilization were and still are organizations such as the World Bank and the IMF (Jones and Kumssa, 2000). When a country undertakes rapid and comprehensive reforms early, it achieves economic stability and growth early. This is because, first, it is able to implement all the necessary reforms, which leads initially to an unstable situation (high inflation, negative growth, and so on), and then it implements stabilization procedures (fiscal rigidity, zero balance of payments, and so on), which leads to a growing GDP. Given that the World Bank is one of the main supporters of such an approach to reforms, it evaluates the ability of a country to take on more assistance by measuring its success in the reforms implemented to date. The macroeconomic stability and reform implementation of the country indicates how well the country will be able to absorb the new assistance dedicated to sector reforms such as those in the health care sector. In fact, according to Sachs (1991), the countries that undertake radical reforms are able to reverse the process of decline in production and growth much faster because, by implementing all reforms sooner, they are able to avoid a lengthy period of hyperinflation and negative growth. Moreover, they are also able to implement policies before existing political interests become mobilized to react against the costs of reform (Przeworski, 1991). In his 1996 study, Sachs found a positive and significant relationship between economic growth and speedy reform progress. Thus, the sooner after the transition the countries achieve stability and growth through the implementation of reforms, the more funds they are likely to receive from the World Bank and the sooner they will receive them (Wallich, 1995). International financial institutions have usually rewarded those countries that started their economic transformation earlier than others.

Even though it has a different function than commercial banks, the World Bank still behaves according to the banking principles of returns on their investment and avoidance of high-risk loans. This means that the bank will steer clear of or provide very limited lending to countries that do not rank very high on their evaluation of past economic performance with respect to reform success

(Wallich, 1995). Thus, when the bank lends resources for the purpose of health care sector reform, it will be likely to give less assistance to those countries that score lower on the evaluation list in order to minimize the bank's potential loss in case the country fails to implement the reforms successfully or defaults on the loan repayment, or both. If that country experiences high growth and has achieved fiscal stability, it is more likely to repay its debt to the World Bank than a country whose fiscal deficit is not under control and whose growth has been stalled by poor reforms (Howell, 1998). Furthermore, these types of loans, as opposed to loans meant for infrastructure development, do not bring financial returns to the borrower, and are thus harder to repay.

To summarize the argument thus far, the World Bank's willingness to provide support depends on the agency's evaluation of a country's past economic performance (growth of GDP) and upon its successful implementation of other reforms such as privatization and macroeconomic stabilization. Thus, a country that had implemented its initial reforms rapidly and successfully was more likely to receive World Bank support and to do so earlier rather than later. A country with good economic performance was also more likely to receive a larger amount of funding, given that such a performance reflects the likelihood that the country will be able to take advantage of the loan effectively and be able to repay it as agreed. In combination, these conditions lead us to formulate the following hypothesis:

Hypothesis 1: The higher a country's macroeconomic performance, the better the health care sector performance.

Financing

Financing is one of the most important factors influencing the performance of the health care sector (Davis, 2001). In developed capitalist economies, the amount of money spent per capita on health care affects the quality of care. It has also been found that an increase in medical care spending has a direct, positive effect on health outcomes, as is measured by the infant mortality rate (Phelps, 2002). According to János Kornai (2000), health care spending in former command economies was not unusually high, as some have suggested (due to its inefficiency). Rather, it was not funded properly in comparison to other sectors. Thus, the more financial assistance is available for the purpose of reforming the sector, the more successful the health care reform is likely to be, all other things being constant. Such assistance is needed not only for the renovation and technological updating of hospitals, but also for the restructuring of the wage system of health care employees and the reform of the underfunded health insurance system:

Hypothesis 2: The larger the amount of assistance a country receives, the better its health care sector performs.

Institutions

The success of the financial support provided by the World Bank is also affected by the level of institutional effectiveness in the country. Ablo and Reinikka (1998) show how budgetary allocations for public spending, such as health care spending, can be inaccurate in the context of an ineffective institutional setting. Effective institutions provide for checks and balances in implementing the rule

of law and create incentives not to cheat (Diamond, 1996). Where institutions are ineffective, the policy implementation process breaks down, and in the case of resources delegated for public spending, the actual inputs do not reach the intended targets. This occurs in societies where the democratic process of transparency is lacking, so that there is no accountability for government officials (Shahriari et al., 2001). Others, such as Svensson (2000), find that the control of public policy is less effective in highly polarized societies and where there is some degree of social conflict. Given that the process of democratization is a long-term process, for CEECs the presence or absence of institutional effectiveness may play a significant role in the success of health reform implementation.

The World Bank's support for reforms could be either promoted or inhibited by the institutions of a country.[6] Effective institutions could increase the benefit from World Bank support by holding the government accountable and making the process more transparent. By allocating the funds inappropriately, ineffective institutions could inhibit the reform process by misallocating the funds because of corruption or lack of skills to implement it. Some of the funds might never serve their initial purpose or reach their intended target. The success of health care sector performance is also dependent upon the ability of the government to translate policy into actual effect (Ablo and Reinikka, 1998). In order for the implementation to be successful, the process must be transparent and there must be a structure of accountability for government officials. In other words, the institutions in place must be strong enough to implement the reforms fairly and effectively:

Hypothesis 3: The more effective the institutions are, the better the performance of the health care sector.

The theory in this article proposes that the improvement in health care sector performance, supported by the World Bank, depends not only on the amount of aid provided by the World Bank, but also on the strength of the institutions in the particular country. Figure 1 describes the relationship between World Bank financial support and the success of health care reforms. Health care sector performance is the ability of the health care sector to offset the negative effects of illness (Davis, 2001).[7] First, the World Bank allocates funds based upon need as well as upon its country evaluation, which indicates how likely a country is to repay its loans. Countries that are better off economically are more likely to repay the loans and are, thus, more likely to receive funds sooner and in larger amounts. However, money without oversight can be misused and not be directed to the proper recipients. Thus, the funds from the Word Bank are a necessary, but not sufficient, condition for improving health care sector performance. In addition to the amount and timing of funds, the institutional effectiveness in establishing and enforcing the rule of law so that the funds allocated for the health care sector are spent as intended is crucial in order to achieve an effective reform of the health care sector. The rule of law is essential to health care sector performance because it curbs corruption and ensures accountability and transparency. The analysis of the impact of timing of loans on health care sector performance is not undertaken in this article, but can also have important implications on health care sector performance.

The following section explains the sample selection, variable operationalization, and methods of analysis used to test the listed hypotheses.

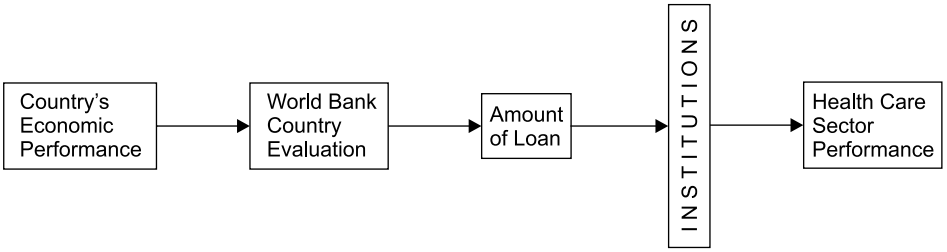

FIGURE 1. *Impact of the World Bank on Health Care Success*

Research Design

This section presents the tests of the hypotheses developed in the previous sections using data from a sample of all 26 countries of Central and Eastern Europe. The unit of analysis is *country-year*. The criterion for selecting the countries is that prior to 1989 they were Leninist regimes in Central and Eastern Europe. Annual data on each country was collected for the time period between 1980 and 2003. The starting point was chosen in order to account for the difference in the state of health care before and after the transition. Using 1980 allows us to estimate more accurately the pre-reform status quo on most of our variables. Thus, there should be 592 country-years in the sample. However, because of missing data, the sample size is smaller. The summary statistics are presented in Table 1.

Dependent Variable

The dependent variable is health care system performance, which is the ability of the health care service to offset the negative effects of illnesses (Davis, 2001).[8] Here, the concept is measured by using cancer mortality, commonly called the "standardized death rate from cancer."[9] This single measure is used because it is the health issue where health care matters the most.

Cancer mortality is the proportion of total deaths per 100,000 that are a direct consequence of malignant growths. This measure is important because the CEECs' health care sectors had a relatively well-developed system of basic preventive care through secondary school, but not beyond. Since cancer mortality is higher when the detection is late, this measure is an indicator of the preventive and diagnostic services of the health care sector. It is also less affected by factors exogenous to the health care sector, thus less likely to capture spurious relationships. This implies a measure of the system's efficiency as well, given that preventive and diagnostic care is less costly and more effective than palliative care. Incorporated in this measure is also the capacity of the health care system to extend the survival of those diagnosed with cancer.[10] In the CEECs, diagnostic care such as cancer screening was seen as expensive. Ultimately, cost cutting in this care led to higher costs because more invasive and costly interventions were needed to treat cancer that was not detected until it was in an advanced stage. The variable is normally distributed with the right tail being slightly thicker, indicating that the proportion of cases where cancer deaths were the highest is slightly larger than cases where cancer deaths were the lowest. Cancer mortality is measured as the Standard Death Rate (number of malignant neoplasm deaths per 100,000) and is taken from the World Health Organization's Health For All database.

TABLE 1. *Summary Statistics*

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Cancer SDR	611	171.28	41.58	64.76	277.98
Corruption	611	5.74	6.51	0.00	85.28
World Bank funds	611	0.24	1.08	0.00	10.36
Institutional effectiveness	611	–0.70	0.61	–1.45	1.06
Economic performance (CPI)	611	81.01	548.22	–60.89	6673.35
Civil war	611	0.039	0.194	0.00	1.00

Independent Variables

World Bank Health Care Sector Funding

Prior studies show that World Bank funding of health care sector reforms in some CEECs has had a positive impact on health care sector performance. More specifically, it has been shown to have a significant effect in countries that have also performed well in macroeconomic terms (Radin, 2003). Since the World Bank has been the only international agency to give significant and measurable support to transitioning countries of the CEE, it is appropriate to measure the dollar amount per capita disbursed to each country by the World Bank. The amount of assistance measures the amount of World Bank assistance given to a country. It is a US dollar per capita measure. Since the assistance data is usually given in a package with resources intended for other sectors, the exact amount for health care was calculated by multiplying the total dollar amount of the loan by the percentage of the loan allocated to the health care sector. Then, in order to account for the population size, the real dollar amount is divided by the population size. The variable ranges from zero to infinitum, though the maximum is US$10.36 per capita (see Table 1). The mean being so close to the minimum value (0.24) and the large standard deviation are a reflection of the World Bank's lending patterns: while most countries never received any funding from the World Bank, for those who received a great deal of funding the amounts varied greatly. Also, the graphs shown in Figure 2 indicate that the funding did not begin until the mid- to late 1990s and that the proportion of those countries who received the average or below average amount of money is higher than those who received above average. The data has been collected from the International Development Agency (part of the World Bank) web site.

Institutional Effectiveness

The ability of a government to fight corruption and instill public trust in government institutions is affected by the institutionalization of the rule of law. Thus, institutional effectiveness is measured as the existence and effective implementation of rules by the government. This measure comes from the World Bank Governance Indicators (World Bank, 2006). More specifically, the rule of law measure includes several indicators, which measure the extent to which people have confidence in and abide by the rules of society. These include perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts. This measure is used by the World Bank as one

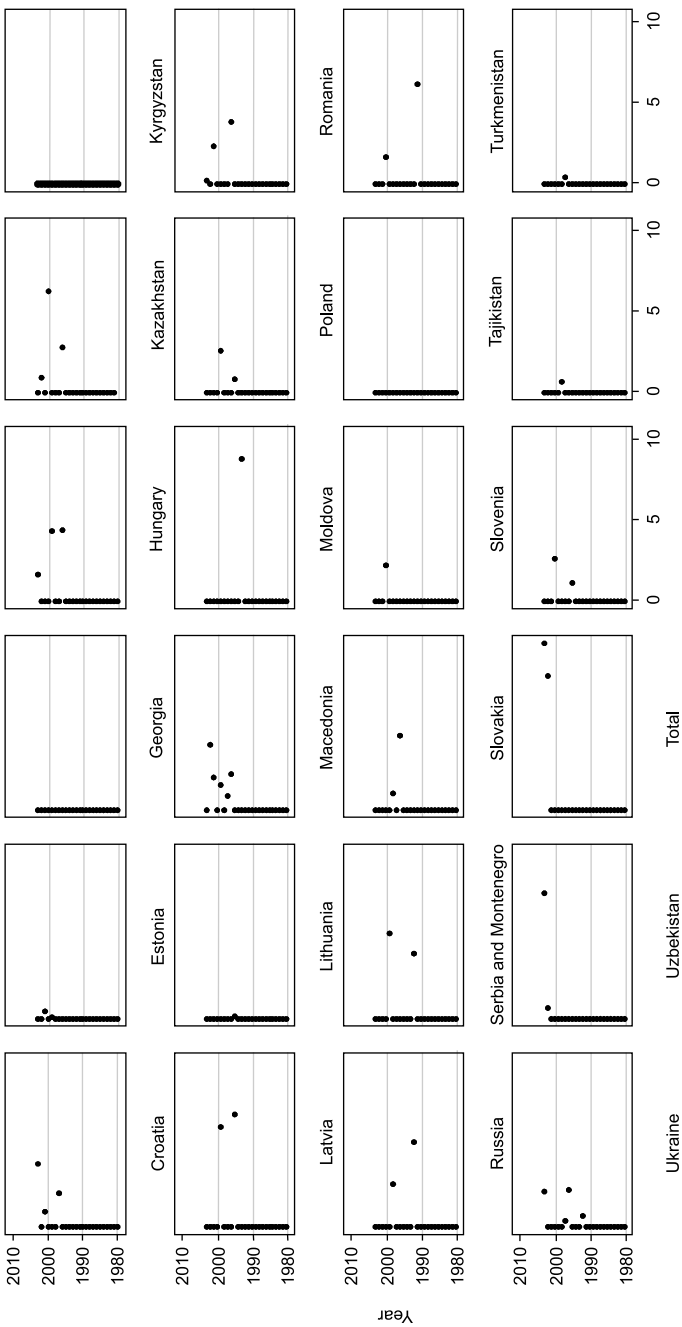

FIGURE 2. *World Bank Per Capita Health Care Funding over Time and by Country (1980–2003)*

of the measures in evaluating the ability of a country to absorb the funds given to it through assistance. The values range from –2.5 to 2.5, with higher scores corresponding to better outcomes. The distribution of the data is skewed to the right side (the mean is –0.7061, closer to the minimum value), indicating that the majority of the countries during this period have ineffective institutions. Since the data are biennial, the missing years are filled by means of linear imputation in order not to lose other valuable observations.

Economic Regime Performance

Country performance in the post-transition period is measured by looking at its economic performance. Economic performance is measured in terms of macroeconomic indicators. The reason for selecting macroeconomic indicators versus some indicators of individual experience is the notion that people evaluate the government in a sociotropic manner, that is, by blaming the government for the general economic situation in the country. The indicator of economic performance used is inflation (Consumer Price Index with 2000 as the baseline year).[11] The data are from the World Development Indicators (World Bank, 2005) and the United States Development Agency databank.

Control Variables

Level of Health Care Corruption

One of the factors that has been afflicting the health care sector in the CEECs is corruption in the form of informal payments to medical staff and budgetary misallocations (Ensor, 2004; Gotsadze et al., 2005; Kornai, 2001; Kornai and Eggleston, 2001; Lewis, 2000; Lotspeich, 2003; Rybakov, 2005).[12] Because of the drawbacks and inappropriateness of existing measures, in this article corruption is measured by using multiple variables, including some of the ones mentioned above. The first measure, and the one most widely available, is the extent of the shadow economy as a percentage of GDP.[13] This measure is adopted for several reasons. First, as a number of authors (Kornai, 2000; Lewis, 2000) have noted, hidden payments were not considered illegal since there were no provisions for punishment of such behavior under the old regime. In many of the CEECs, the line between gift giving and bribery is a fine one that varies across cultures. Even though this method measures the level of unofficial economic activity (shadow economy), rather than the direct amount of bribes given in the health care sector, it is still a useful proxy that allows us to study a larger number of countries for a more extensive time period. The second measure is the Corruption Perception Index (Transparency International, 2006), used to complement the primary measure. The score a country receives for each year ranges from 1 (worst) to 10 (best).

Other commonly used variables in assessing health care sector performance such as number of beds, physicians, nurses, and others are not included in this model because the assumption in this article is that all CEECs find themselves at a similar point in their health care sector performance, given their similar experiences during the command economy period and reform trajectories undertaken in the 1990s. This does not imply these other factors are not important; quite the contrary, they are important and usually are part of a country-specific and comprehensive health care sector reform, which is not the focus of this article.

Civil War

Some countries of Central and Eastern Europe experienced prolonged civil wars during the transition period that significantly affected their economies, including the health care sector (Elbadawi and Sambanis, 2001; Imai and Weinstein, 2000; Kang and Meernik, 2005; Murdoch and Sandler, 2002; Sandler and Murdoch, 2004). The measure of civil war used here comes from the Fearon and Laitin (2003) civil war data set. The choice of controlling for the civil war effect, rather than excluding the eight[14] countries that experienced civil war during the transition period, is in the interest of not losing other valuable observations, while considering the debilitating effects that civil wars can have on the political and economic stability of a country. Furthermore, the range and duration of some civil wars (Slovenia, Moldova, and Serbia and Montenegro) were very different from those in other countries (Croatia and also Bosnia and Herzegovina).

Method

Since the study uses time-series cross-sectional data, there is a concern both with serial correlation and heteroskedasticity. The choice was to use a linear autoregressive distributed lags (ADL) model, with the panel-corrected standard-error linear regression model, in order to deal with panel heteroskedasticity. An extensive debate exists in the literature about which model to use and what kind of restrictions to place on the parameters, given the nature of time-series cross-section (TSCS) and panel data (Beck and Katz, 2004; DeBoef and Keele, 2005; Garrett and Mitchell, 2001; Kittel and Winner, 2005; Plümper et al., 2005). Most recently, authors have agreed that this is an appropriate way to deal with the possibility that observations with higher values also may have a higher error variance. Using a panel-corrected standard-error model corrects this violation of the ordinary least squares (OLS) standard assumption for panel data (Beck and Katz, 2004; Plümper et al., 2005).

For this analysis, the data are pooled because of the advantages of increasing the number of observations and degrees of freedom (Plümper et al., 2005). Another advantage is that it makes it possible to generalize the results across countries. In order to eliminate serial correlation of errors, I add to the model a lagged dependent variable as suggested by Beck and Katz (2004).

The theoretical framework describing what variables influence health care sector performance implies that there are lasting effects of some of the independent variables that go beyond the time period t under study and that these effects may be spread over future time periods $t + 1$, $t + 2$, and so on. One example of such a variable is institutional effectiveness. In the theory, the effects of institutions are such that effective institutions that uphold the rule of law lower corruption and build popular trust and support for these institutions. The effect is likely to persist over future time periods since the longer the institutions are present, the more trust is built up among people over time. Thus, these theoretical implications require that dynamic effects be specified in the model so that they can be accounted for and interpreted. Following suggestions by DeBoef and Keele (2005), the dynamic effects of independent variables are easily specified in the ADL. A general ADL model is presented in Equation 1:

$$Y_{ti} = \alpha_0 + \alpha_1 Y_{t-1} + \beta_0 X_{ti} + \beta_1 X_{t-1} + \varepsilon_{ti} \qquad (1)$$

In this time-series model, there may be two effects that an independent variable can have on the dependent variable. First, it can have a short-term effect, which may occur at any lag, but its effects do not persist over future time periods. The effect of high popular support can influence government decisions today, but not tomorrow. In the general model, this effect is given by X_t on Y_t and it has no memory. The same variable may also have a long-term effect on the dependent variable. That is, changes in X_{t-1} affect Y_t and that effect is distributed over several future time periods (DeBoef and Keele, 2005). There are four exogenous variables that are hypothesized to have a long-term effect on health care sector performance, and they include World Bank funding, institutional effectiveness, and the economic performance of the regime.

Analysis and Discussion

In this analysis, I discuss the results from the models measuring the impact of World Bank funding on cancer mortality. Cancer mortality measures multiple aspects of the health care sector: since cancer mortality is higher when detection is late, this measure is an indicator of the preventive and diagnostic services of the health care sector. This measure is also less affected by factors exogenous to the health care sector (nutrition, working conditions, and so on) than measures such as life expectancy or infant mortality. Cancer mortality is also more suited for the former communist countries, where preventive care through secondary schools is well established (through the programs of the World Health Organization and UNICEF), while its absence in the services for the adult population results in high cancer mortality rates. This implies a measure of the system's efficiency as well, given that preventive and diagnostic care is less costly and more effective than palliative care. Incorporated in this measure is also the capacity of the health care system to extend the survival of those diagnosed with cancer.

Two models are presented. The distinction between the two is that Model 2 incorporates the interaction variable between World Bank funding and the level of corruption to assess whether the impact of World Bank funding is affected by the present level of corruption in a country in any given year. The first section of the analysis presents the short-run effects obtained from the autoregressive distributed lags to assess the effects of each covariate in the first two years. The second section presents the long-run multipliers. The long-run multipliers represent the total, cumulative effect that the selected independent variables have on the dependent variable over future periods. The average number of years over which an effect takes place is calculated from the estimates of the ADL models.

Short-Run Effects

The short-run effect of Word Bank funding is not significant in either model, with the exception of when it interacts with corruption in Model 1. The results are presented in Table 2.

The interaction effect has been included because it is reasonable to expect that in countries where corruption is rampant, funds received from the World Bank may be used for purposes other than to improve the health care sector, and therefore their potential effect may not be realized. Such was the case of the Russian Federation when in 1994–95 Putin diverted an undetermined amount of funds appropriated for the health care sector to fight the war in Chechnya

TABLE 2. *Regression Results*

Variable	Model 1	Model 2
Dependent variable		
Cancer Mortality$_{t-1}$	**0.9393***	**0.9334***
	(0.0333)	**(0.0334)**
Independent variables		
World Bank funding$_t$	0.6099	–0.4678
	(0.7606)	(0.6429)
World Bank funding$_{t-1}$	–0.5278	–0.3816
	(0.7301)	(0.7374)
Institutional effectiveness$_t$	**4.2499***	2.3398
	(3.1706)	(3.1849)
Institutional effectiveness$_{t-1}$	–2.7014	–0.4359
	(3.1812)	(3.2231)
World Bank/institutional effectiveness	–1.0119	–0.6792
	(1.0510)	(1.0836)
Economic performance$_t$	**–0.0022***	**–0.0019***
	(0.0014)	**(0.0014)**
Economic performance$_{t-1}$	**0.0012***	**0.0013***
	(0.0010)	**(0.0011)**
Control variables		
Corruption	–0.0425	**–0.2742**
	(0.1386)	**(0.1248)**
World Bank/corruption	**–0.1511***	
	(0.0541)	
Civil war	–2.6349	–0.5574
	(2.6644)	(2.885)
Constant	**12.5524***	**15.0429**
	(6.4873)	**(6.5254)**
R^2	0.9088	0.9066
Residual SE	0	0
N	592	592

Notes: *Significant at p > 0.10. Standard errors in parentheses.

(Twigg, 2000). With an average level of corruption (the mean is 5.74), a US$1 per capita increase in World Bank funding decreases cancer mortality by –0.7824[15] deaths per 100,000 people. When corruption is at its maximum (85.28), a US$1 per capita increase in funding makes a much more significant impact, decreasing cancer mortality by –12.8011[16] deaths per 100,000 in the first two years. This inter-action between World Bank funding and corruption is different from what could be reasonably expected. It may be an indication that in those instances where corruption in health care is rampant, so that the inequality between those who can pay a bribe and those who cannot is pronounced, World Bank funding may be actually helping diminish the deaths from cancer more. This is because by funding those health care sectors where corruption is the modus operandi,

though many cannot afford to pay bribes, the funds may give an alternative to those who would not otherwise be able to get the necessary care to enhance their survival chances. In other words, since the World Bank funding becomes part of the total spending dedicated to health care, all those who depend upon state-provided health care benefit from the increased funding. In the case of Bosnia and Herzegovina, where the change in corruption levels is the largest (64.52 between 1995 and 1996), the average decrease in cancer deaths from 1995 to 1996 for a US$1 increase in funding is –9.6649[17] per 100,000. Another possible explanation is that corruption present in the health care sector comes mostly in the form of micro-level corruption, or what Levin and Satarov (2000) call "grassroots" corruption, rather than macro-level, budgetary corruption. Grassroots corruption has in fact increased dramatically in the post-transition period, especially in terms of the share of physicians' income that comes from bribes. In Russia, as in many other CEECs, the most prevalent form of bribe is the one given to medical staff and hospitals. In 1998, 31 percent of all informal payments were made to general hospitals, 21 percent to physicians, and 7 percent to nurses (Lewis, 2000). Thus, while micro-level corruption may be rampant, it does not affect negatively the funds allocated to the health care sector by the World Bank. This effect on cancer deaths is not only significant, but can also be large when considering the total numbers of deaths from cancer in any given year. For example, in 1996, the total number of deaths from cancer in Bosnia and Herzegovina was 132 per 100,000, while in the same year World Bank funding had the average effect of decreasing deaths per 100,000 by 9.66 (a 7 percent decrease). This alludes to the possibility that World Bank funding has more significant effects, and may thus be more beneficial, in countries whose health care system is pervaded by corruption because of the compensating effects explained above. This interaction between corruption and World Bank funding is not included in Model 2, and World Bank funding has no significant independent impact on standardized deaths from cancer in this model, indicating the possibility that the expected effect from World Bank funding is dependent on the level of corruption present at the time. This is a thought-provoking finding, given that it is contrary to the commonly expected effect that corruption negatively impacts the appointed use of funds.

Another variable with a significant effect on cancer deaths in the short run is institutional effectiveness. A one-point increase in institutional effectiveness increases cancer deaths by 1.5485[18] per 100,000. Although this finding is opposite from the relationship hypothesized, there is a sensible explanation for it. While the creation of effective institutions provides more transparency and accountability in the implementation of rules and budgetary allocations, as well as bolstering the evaluation process by lending agencies such as the World Bank, the existence of such institutions does little to address the issues in a low-performing health care sector. In other words, while institutions are necessary to provide for more transparency, accountability, and implementation of the rule of law, they are not sufficient to improve the performance of the health care sector as they do not address the causes of its structural issues directly. Furthermore, effective institutions are likely to impose sanctions on the bribe-giving practices that characterize the CEECs, health care sectors. Even though this effect is desired, it also takes away the only mechanism, albeit corrupt, of getting around poor health care delivery. In the absence of reforms to address health care sector problems, strict rules take away the ability of the patients to get preferred treatment by the doctors by slowing down

the process, increasing the numbers of those waiting for treatment, and lowering the quality of care. This implies that the implementation of effective institutions exclusively to crack down on corrupt practices is not sufficient to improve the health care sector's ability to treat cancer patients successfully. Institutional effectiveness is measured using the rule of law measure provided by the World Bank Governance Indicators (World Bank, 2006), which captures the implementation of the rule of law not just in health care, but in all spheres, both public and private. Thus, the measure is valid in terms of capturing the general implementation of the rule of law in society, including health care. This goes hand in hand with the finding in Model 2 that corruption has the significant effect of decreasing cancer mortality. A 1 percent increase in corruption decreases cancer mortality by –0.2742 deaths per 100,000. Corruption serves as a temporary mechanism for some patients to get better and more timely care, even though it has negative repercussions on equity, access, and health care sector performance in general. These short-term findings, when taken together, indicate that the implementation of effective institutions has an effect of increasing cancer mortality, not because it is inherently a negative policy implementation, but because by itself it does exactly what it is expected to do – curb corruption. However, without the simultaneous implementation of reforms that would eliminate the causes of corruption in health care, effective institutions have the negative short-term effect of taking away the only "release valve" in these inefficient systems.

Finally, the economic performance of the regime has a significant, albeit small, effect on cancer deaths in the expected direction in both models. In the short run, a 1 percent increase in economic performance decreases cancer deaths by –0.001 in Model 1 and by –0.0006 in Model 2.[19] This effect is very small, indicating that while economic performance is important and necessary, similar to institutional effectiveness, it does not replace the need for countries to address the sources of their low health care sector performance.

Most of the variables that were found to be significant in the short run also have significant long-run effects on health care sector performance.

Long-Run Effects

In addition to the short-run, immediate effects of the covariates, there are also significant long-run effects on cancer mortality. This means that they have an effect that lasts beyond the first two years. The significant long-run effects (k_1 multipliers) for cancer mortality are reported in Table 3.[20] The mean lag length also presented here is the average number of time units (years) over which the long-run effect takes place (DeBoef and Keele, 2005).

The first variable to have a significant long-run effect on cancer mortality is economic performance. A 1 percent increase in economic performance decreases cancer mortality by –0.0165 deaths per 100,000 in Model 1 and –0.0124 per 100,000 in Model 2.[21] This effect lasts an average of about 16 years (for both models) and 13.33 percent of it is realized in the first year in Model 1 and 21.20 percent in the first year in Model 2. As is the case in the short run, economic performance has a significant effect on cancer mortality as hypothesized, but its effect is small, indicating that improvements in economic performance alone do not suffice in addressing cancer mortality issues in the CEECs. However, economic performance is a significant indicator used by the World Bank to evaluate the borrowing country's creditworthiness, or ability to repay the loan. Thus, while it may have only

TABLE 3. *Long-Run Effects of Independent Variables*

Variable	Model 1	Bewley	Model 2	Bewley
k_1 economic perf.	–0.0165	–0.0393	–0.0124	–0.0869
		(0.0166)		(0.2321)
k_1 institutional eff.	25.51	12.1292	5.4357	11.0885
		(1.2882)		(1.3605)
k_1 World Bank*corruption	–1.1367	–0.1065	–	–
		(0.0421)		
k_1 World Bank*institutions	–15.3196	1.1026	–	–
		(0.8497)		
N		588		583

a small direct effect on health care sector performance, it has as indirect effect through the World Bank's assessment (Howell, 1998; Wallich, 1995). At the same time, the very large standard deviation (see Table 1) of economic performance during this period may be affecting the overall average effect it has on cancer mortality, given that the period under study is one in which all these countries underwent complete economic transformations marked by severe economic fluctuations. The fact that the total effect of economic performance lasts for as long as 16 years for any given change in a year indicates that attention needs to be paid to economic performance because it has a very important impact on long-term health care sector performance. It is, therefore, not surprising that both country governments and international agencies stress the need to ensure long-term economic stability in the CEECs as a precondition for other reforms.

The effect of institutional effectiveness on cancer mortality is comparatively strong when evaluated next to the effect of economic performance. A one-point increase in institutional effectiveness increases cancer mortality by 25.5100 deaths per 100,000 in Model 1 and 5.4357 deaths per 100,000 in Model 2.[22] Similar to its short-run effect, this effect is contrary to the one hypothesized, but while the effect is much stronger, the explanation is similar. While the creation of effective institutions provides more transparency and accountability, improves the evaluation by the World Bank, and punishes health care workers who extort money from patients, it does not address directly the causes of cancer mortality. Because effective institutions are implemented correctly, by imposing sanctions on the corrupt practices that characterize the CEECs' health care sectors, they take away the only mechanism for getting around poor health care delivery. This implies that the implementation of effective institutions is not a sufficient solution to low health care performance in the CEECs. The long-run effect of institutions on cancer mortality lasts for an average of about 14 (Model 2) to 17 (Model 1) years, and about 26.5 percent takes place in the first three years in Model 1[23] and about 21 percent in Model 2. This effect is strong when considering that the average cancer mortality value is 171 deaths per 100,000 (that is, a 15 percent increase for Model 1 and a 3 percent increase for Model 2 over periods of 14 and 17 years, respectively). While in the long run, similar to the short run, effective institutions also increase cancer mortality, it implies that more comprehensive health care sector reforms are needed in order to address the inefficiencies plaguing the health care sector. As an example, while Croatia has seen an increased targeting

of individual corrupt practices in the health care sector through the prosecution of prominent physicians who have taken bribes, the government has not been as diligent in the sphere of health care sector reforms.[24]

Finally, the long-run effect of World Bank funding is significant only when interacting with the effect of corruption and institutional effectiveness. Similar to the short-run effect, given an average level of corruption, a US$1 per capita increase in World Bank funding decreases cancer mortality by –1.1367 deaths per 100,000 in Model 1 and –4.2144 per 100,000 in Model 2.[25] This is an average decrease in cancer mortality of 2.5 percent in Model 2, which is not a large decrease, but it shows that as little as a US$10 per capita capital funding increase by the World Bank per year could decrease cancer mortality by more than 20 percent. In fact, increases in health care funding by the World Bank lower cancer mortality, even though the overall impact may not be as large as this, considering that the largest per capita World Bank funding in this sample is for US$10.36 (Slovakia in 2003). For Slovakia, that would mean that for 2003 there was an average decrease of 43.66[26] cancer deaths per 100,000 due to World Bank funding. Data on cancer deaths for Slovakia show that there was a decrease of 48.6 deaths from cancer in 2003–04 (from 211 to 162), indicating that there was a significant decline or improvement in cancer death rates that could reasonably be attributed mostly to World Bank funding, and to a lesser extent to other factors such as economic performance. The long-run effect lasts for an average of seven to eight years (in both models). Most of the effect, some 56.88 percent, occurs in the first three years in Model 1, while in Model 2 the corresponding figure is 27.95 percent.[27] The fact that World Bank funding has a significant and expected effect in lowering cancer mortality, especially in health care sectors afflicted by corruption, implies that larger amounts of per capita funding could have larger impacts, lowering cancer mortality even further. World Bank funding also has a significant effect in the long run when it interacts with the effect of institutional effectiveness, but its significance is present only in Model 1. A US$1 per capita increase in World Bank funding, with an average level of institutional effectiveness, decreases cancer mortality by –15.3196[28] deaths per 100,000 (or about 9 percent of the average value) and the effect is expected to last for an average of 15 years. This finding is also important because it indicates that in CEECs, even where the level of institutional effectiveness is at a relatively low average level (the mean is –0.7 [see Table 1]), World Bank funding has a significant effect on diminishing cancer mortality. This finding fits within the analytical framework of the effects of institutional effectiveness and corruption in the CEECs discussed earlier. In the long run, the independent effect of institutional effectiveness increases cancer mortality. However, the interactive effect of World Bank funding and institutional effectiveness decreases cancer mortality, and this effect is much stronger than that of the interactive effect of corruption and World Bank funding, though not as strong as the effect of institutions alone (see Table 3). These results could have a number of implications. Institutional effectiveness by itself, both in the short and long run, takes away the only mechanism for people to get care in a corrupt health care sector. However, in the long run it also increases the success of World Bank funding in decreasing cancer rates by improving the countries' ability to absorb the funds or by improving the country assessment by the World Bank, or both.

The two models have large R^2 values. However, R^2 is a poor measure of fit in these two models since the R^2 will be inflated by well-meaning fixed effects across the observations. Furthermore, if the trends in the data are strong, the R^2 will be further elevated (C. Hsiao, 2003). When discussing the issue of the size of the R^2, it is important to mention that the cumulative, long-run impact on cancer mortality uncovered in this article is fairly large when it comes to the effects of institutional effectiveness and World Bank funding while that of economic performance is small. In fact, institutional effectiveness has the cumulative effect of increasing cancer mortality by 15 percent (the multiplier is 25.51 for Model 1), while World Bank funding (interacting with corruption and institutional effectiveness) has a cumulative effect of, on the average, decreasing cancer mortality by 9 percent in any given year (the multiplier is –15.31 in Model 1).

Conclusion

In this article, I have analyzed the impact of World Bank funding and institutional effectiveness on health care sector performance in the CEECs. I used cancer mortality to measure health care sector performance because it captures the performance of preventive services, treatment performance, and it is less susceptible to spurious effects.

The results from the analysis are interesting and in some cases unexpected. In both the short and long run, World Bank funding has no independently significant effect on cancer mortality and the only significant effect is present when it is in interaction with corruption or institutional effectiveness. This finding underlines the need for the consideration of domestic factors (corruption and institutional effectiveness) when analyzing the impact of international funding on health care sector performance because of their ability to affect the goals of international lending agencies such as the World Bank. Similarly, it shows that World Bank funding is more effective at lowering cancer mortality in instances when corruption is so high as to prevent most people who cannot offer bribes from getting the care they need by benefiting the funding of the entire medical sector through its loans.

Another interesting, albeit unexpected, finding is that institutional effectiveness has a detrimental effect on cancer mortality, in spite of a different relationship hypothesized in this study. The worsening of cancer mortality through the introduction of more effective institutions could be an indication that institutions, on their own, cannot address the causes of health care sector performance and that, in the case of Central and Eastern Europe, their implementation worsens the situation by taking away the only mechanism that allowed patients to get around an inefficient sector. This points to the need for further studies of health care sector reforms and institutions, and their impact on health care sector performance.

Notes

1. The World Bank will be used interchangeably with the International Bank for Reconstruction and Development (IBRD) throughout the article.
2. H = f(T,M), where the production of health (H) is a function of disease (T) and medical system success (M). Thus, the relationship between H and T is negative, while that between H and M is positive (Davis, 2000).

3. Among the most widely used measurements of health care system effectiveness are life expectancy, infant mortality, and birth weight.
4. In the case of Poland, the ministry of health tended to reflect the interests of particular groups of doctors and there was tension between the ministry and the state health fund about who would manage the funds (Nelson, 2001).
5. Economic returns, as opposed to financial returns, incorporate both the social benefits, such as a healthier, better educated population, and also social costs, such as pollution (Wallich, 1995).
6. The institutions variable is an intervening variable.
7. See n. 2 above.
8. See n. 2 above.
9. Other measures commonly used in other studies include birth weight, perinatal weight, invalidity rate, and others. For example, birth weight has been used to measure health care performance in developing countries where malnutrition is an issue.
10. There are other factors, such as lifestyle or genetic inheritance, that affect the likelihood a person will fall ill to cancer or die. Certainly, lifestyle choices help explain a large proportion of deaths in the former communist countries of the CEE (Brainerd and Cutler, 2006). Taking that into consideration, in this article the standardized deaths from cancer measure is used to measure the ability of the medical sector to detect early, prevent, and treat cancer. While cancer incidence may not be greatly influenced by medical sector performance, its prevention, early detection, and treatment do affect survival rates (American Cancer Society, 2007).
11. Other measures that could be used are GDP growth and the unemployment rate. GDP growth was not used because there is a high degree of correlation between it and the corruption measure (incorporates GDP growth), and the unemployment rate data have many missing observations for this period.
12. Informal payments are defined as payments (in cash or in kind) made to service providers (persons or institutions) by patients who are already entitled to the services. The services are already paid for from the national budget under the provisions of universal health care programs (Central and Eastern European Health Network, 2002).
13. The size of the unofficial economy is measured by using electricity utilization rates. Electricity consumption offers a rough measure of overall economic activity, while GDP measures official economic activity. Because the two measures are in different forms (kilowatt-hours versus US dollars), I compare them in terms of their percentage change. Economists such as in Johnson et al. (1997) have used this method of estimating the unofficial economy. They argue that the unit electricity-to-GDP elasticity assumption may lead to a small underestimation of total economic activity in some energy-efficient countries such as the CEECs. However, the difference is not significant. The data on GDP growth are from the World Development Indicators (World Bank, 2005) and the United Nations Statistics Office, while the electricity consumption data are from the National Electricity Information Agency.
14. The eight countries are Azerbaijan (1992–94), Bosnia and Herzegovina (1992–95), Croatia (1992–95), Georgia (1992–94), Moldova (1992), the Russian Federation (1994–96 and 1999–2002), Serbia and Montenegro (1991), and Slovenia (1991).
15. A joint χ^2 test was performed, determining whether β_t and β_{t-1} were jointly insignificant ($H_0 = 0$). In addition $(0.6098 - 0.5277) + (-0.15107) \times (5.74) = -0.7824$.
16. $(0.6098 - 0.5277) - 0.15107 \times (85.28) = -12.8011$.
17. $(0.6098 - 0.5277) - 0.15107 \times (64.52) = -9.6649$.
18. Again, a joint χ^2 test was performed to determine whether β_t and β_{t-1} were jointly insignificant ($H_0 = 0$). In addition, $4.2499 - 2.7014 = 1.5485$.
19. See nn. 15 and 18 above regarding the joint χ^2 testing for insignificance. In addition, $-0.0022 + 0.0012 = -0.001$ (Model 1) and $-0.0019 - 0.0013 = -0.0006$ (Model 2).
20. The k_1 is calculated from the ADL model: $(\beta_0 + \beta_1)/(1 - \alpha_1)$. The mean lag length calculation is $(\beta_1)/(\beta_0 + \beta_1) - (-\alpha_1)/(1 - \alpha_1)$.

21. Regarding Model 1 (–0.0022 + 0.0012)/(1 – 0.9393) = –0.0165, while (–0.0022 + 0.0011)/(1 – 0.9114) = –0.0124 in Model 2.
22. (4.2499 – 2.7014)/(1 – 0.9393) = 25.51 in Model 1. (3.9270 – 3.4454)/(1 – 0.9114) = 5.4357 in Model 2.
23. For Model 1, the percentages for the first three years are 16.66 percent in $t = 0$, 5.10 percent in $t = 1$, and 4.70 percent in $t = 2$.
24. See *Nacional* (2005, 2006) and *Jutarnji List* (2007).
25. For Model 1 (–0.151 – 0.609897 – 0.5278)/(1 – 0.9393) = –1.1367, while for Model 2 (–0.1525 + 0.5596 – 0.7805)/(1 – 0.9114) = –4.2144.
26. (–0.1525 + 0.5596 – 0.7805)/(1 – 0.9114) × 10.36 = 43.66.
27. For Model 1, this breaks down as 40.35 percent in $t = 0$, 8.53 percent in $t = 1$, and 8.00 percent in $t = 2$. For Model 2, the figures are 9.65 percent in $t = 0$, 9.70 percent in $t = 1$, and 8.60 percent in $t = 2$.
28. (–1.0119 + 0.6098 – 0.5278)/(1 – 0.9393) = –15.3196.

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