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INSTITUTIONAL DEFICIT AND HEALTH OUTCOMES IN POST-COMMUNIST STATES

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In this paper we explore political-economic determinants of health. We draw upon the unique natural experiment of post-communist transitions to show the effect on health (measured as life expectancy and cause-specific mortality) of the interaction between institutions for political (democratic rules) and economic (free market entry) competitiveness. To analyze this relationship empirically, we employ panel regression analysis with country and time fixed effects. We find that, ceteris paribus, political and economic institutions exert cumulative positive impact upon health (even if their separate effects are negative or insignificant). One potential causal pathway is that political-economic liberalization increases certainty and people start investing in their health. Our findings are highly relevant to other countries that experience similar reforms.

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Introduction

In the 1990s, post-Soviet republics (Russia, Ukraine, and Belarus) witnessed an unprecedented fall in male life expectancy and still falls short of the 1980s' level, while most Eastern European countries have enjoyed constant improvement in male life expectancy growth. Much of this divergence is attributed to the pace of economic reform, healthcare systems, and alcohol consumption patterns (Bobak and Marmot, 1996; Leon et al., 2010; Marmot and Bobak, 2000; McKee, 1991; 2001; 2006; Shkolnikov, Cornia, Leon and Mesle, 1998; Stuckler, King and McKee, 2009). However, despite much interdisciplinary, scholarly effort, the large variation in these countries' health trends remains unexplained with the existing empirical results being mixed at best.

Political science literature, however, seems more divided on the implications of the rapid economic reforms. Faster economic liberalization is often associated with higher economic growth and lower inflation (for example, De Melo, Denizer and Gelb, 1996). In addition, on a related, but conceptually different question about the relationship between economic liberalization and democratization, some scholars claim that abrupt economic reforms may buttress democratization, whereas others posit that they may impede democratization. (For an excellent literature overview, see Fish and Choudhry, 2007).

Changes in the political realm were no less tectonic than in the economic realm and were shown to influence health outcomes. Yet, the positive impact of democracy on health outcomes is far from being orthodoxical. The recent study by Mackenbach, Hu, and Looman (2013) firmly established the importance of political determinants, in particular, democratization, along with other socio-economic factors, on population health in a "transitional" period. Their findings were largely consistent with the broader consensus in political science literature that democracy as such or democratic stock, (democracy age), exerts a positive impact upon health outcomes measured as life expectancy, infant mortality rate (IMR), and health-adjusted life years (HALE) (Baum and Lake, 2001; Besley and Kudamatsu, 2006; Franco, Alvarez-Dardet and Ruiz, 2004;

Ghobarah, Huth, and Russett, 2004; Lake and Baum, 2003; Lin, Chen, Chien, and Chan, 2012; Mackenbach, Hu, and Looman, 2013; Muntaner, Borrell, Chung, Espelt, and Rodriguez-Sanz, 2011; Vollmer and Ziegler, 2009; Zweifel and Navia, 2003; Gerring et al., 2012; McGuire, 2013; Wigley and Akkoyunlu-Wigley, 2011). In stark contrast, other scholars posit that such influence is either minuscule or absent (Shandra, Nobles, London, and Williamson, 2004; Ross, 2006; Muntaner et al., 2011; Pande, 2003).

At this point it is useful to emphasize that one of the prominent features of the post-communist transitions that distinguish them, perhaps, from all other transformations of a similar scope, is the simultaneity of economic *and* political wide-ranging reforms (Dabrowski and Gortat, 2002; European Bank of Reconstruction and Development [EBRD] Report, 2013; Firdmuc, 2003; Giavazzi and Tabellini, 2005; Melzig, Pleva, and Sprout, 2005; Staehr, 2006). Although Balzerowizc (1994) explicitly stated that political pluralism preceded market reforms, he admitted the simultaneity of reforms in its broadest sense:

In all other cases of radical transition, there was either a focus on the political system while the economic system remained basically unchanged (as in classical and neoclassical transitions) or a focus on the economy while the political regime (usually nondemocratic) was unaffected (p. 76). As a result, it is uncertainty in most important elements of the political regime – actors' positions and institutions – that defines transition period (Bunce, 1993).

Surprisingly few studies, however, address the question as to whether political and economic liberalization reinforce each other's effect on various policy outcomes. As Giavazzi and Tabellini (2005) shrewdly observed, '…economic and political liberalizations have been studied separately, thus missing the possibility that the two might interact' (p. 3). Most of these studies find a positive association between interaction term and economic performance (EBRD Transition Report, 2013; Firdmuc, 2003; Giavazzi and Tabellini, 2005; Melzig et al., 2005). In addition, inclusion of an interaction term between political and economic liberalization into research design proves useful in uncovering a puzzle of a negative association between

4

democratization and economic performance that is often found in the literature (e.g., Firdmuc, 2003). One of Firdmuc's conlclusions specifically states that "... democracy alone, when not accompanied by correspondingly far-reaching liberalization, may have had a negative effect on growth during the early part of transition" (Firdmuc, 2003: 599). In a related, but conceptually different, strand of literature, observers argue that balanced economic and political opportunities mitigate corruption (e.g., Sun and Johnston, 2009). However, none of these studies tested the interaction effect of political and economic liberalization upon health outcomes. More importantly, most of these studies, save for the EBRD Transition Report 2013, tended to focus on economic indicators such as the extent of economic openness (Giavazzi and Tabellini, 2005), the scope of mass privatization (Stuckler, King, and McKee, 2009), or the liberalization index composed as an unweighted mean of eight transition indicators elaborated by EBRD, all of which are policy outcomes rather than institutional foundations, and therefore fail to test an impact of institutionalization per se.

We see a compelling need to fill this gap and to propose an overarching, institutional theory of health for states in transition. We depart from the previous studies in several ways. In this paper, we do not intend to answer whether democratization causes economic growth. Neither do we claim to explore how the sequence of reforms–whether democratization precedes economic liberalization or vice versa–affects health outcomes, which is itself an important question and researchable subject. The goal of this study is two-fold: first, to appreciate the role of institutionalization of both processes, (this is democratization and economic liberalization, which is often either overlooked or assumed to be the same process, but is not (Giavazzi and Tabellini, 2005)) and second, to explore whether the interaction of institutionalization of political and economic liberalization affects population health. To anticipate our findings, simultaneous institutionalization of political and economic competitiveness exerts a large positive independent effect upon health outcomes.

To the point, we argue that the development of institutions for political (for example democratic rules) and economic competitiveness (for example free market entry) exert cumulative positive impact upon health (even if their separate effects are negative or insignificant) because only their combination may efficiently decrease overall uncertainty engendered by transition and thereby encourage citizens to invest in their health.[3] They do so by preventing uncertainty, and thus "health-ruining" processes such as reckless political competition, rent-seeking, power usurpation, bandit capitalism, and oligarchization.

We test our hypotheses empirically using a multivariate time-series cross-sectional (TSCS) regression analysis with country and time fixed effects covering the 1989-2011 period. However, the time range might vary across different model specifications depending on data availability, especially for confounders. Data on life expectancy at birth, IMR, age-standardized cause-specific mortality rates, politico-economic conditions, and potential confounding variables were compiled from the existing data sources (HFA; Eurostat; Demoscope Database; EBRD transition indicators; Quality of Governance Dataset). The results largely corroborated our hypothesis.

Organizationally, Section 2 of this paper presents our main theoretical argument that simultaneous institutionalization of democratization and economic liberalization processes lead to most optimal health outcomes. Section 3 offers a potential causal pathway that these processes decrease overall uncertainty during transition, which inter alia encourages citizens to invest in health and leads to improved health outcomes. Section 3 devises an alternative research design for testing our main propositions as well as describes variables and data sources in detail. Section 4 provides our main regression analysis results that largely corroborate our hypothesis. Section 5 places our argument into broader political context and evaluates whether our theory is relevant to analyzing the so called "hybrid regimes". Section 6 presents certain limitations of the research,

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[3] Following North (1990), institutions are defined broadly as rules of the game. "We must create incentives for people to invest in more efficient technology, increase their skills, and organize efficient markets. Such incentives are embodied in institutions" (North, 2000, qtd. in *World Development Report*, 2002, p. 3).

summarizes our main conclusions and policy implications.

Theory

The essential feature of all post-communist transitions was the introduction of some degree of competitiveness in both political and economic spheres. In general, according to the EBRD Report of 1995, by that year the most successful countries had passed and amended competition laws and broke up major cartels (like Hungary), whereas slow reformers were only starting to consider competition law (like Georgia). Timing and progress in democratization also reveals much variation. Whereas the Czech Republic, Hungary, and Slovenia had become full-blown democracies by 1993, Russia and Georgia remained somewhere in between. Belarus and most Central Asian republics either successfully retained or slid back to authoritarianism. In addition, although in most cases political institutions were built hand in hand with economic institutions, there is much variation in the degree of simultaneity in conducting those reforms (see Figure 1).

In general, Melzig et al. (2005) demonstrated graphically that converging and diverging trends in implementing democratic and economic reforms corresponded to the well-known "fault line" between CEE (Central and Eastern Europe) and Eurasia, respectively. The first group includes Slovenia, Slovakia, Poland, Lithuania, Latvia, Hungary, Estonia, and the Czech Republic, while the second includes Russia, Kazakhstan, Belarus, Azerbaijan, Armenia, Kyrgyzstan, and, to a lesser extent, Uzbekistan and Turkmenistan. Curiously enough, countries where political and economic institution building proceeded in different directions demonstrated health outcomes which are either below average among the post-communist states or stagnating. If the CEE states listed above enjoyed the mean of 71.9 years of life expectancy for males (a 5.0-year increase since 1989) and 80.3 for females (a 4.9-year increase since 1989), the Eurasian group revealed a 65.1- year life expectancy for males (a 0.2-year decrease since 1989) and a life expectancy of 74 for females (a 0.7-year increase since 1989).

Although the positive role of economic and political competition, both for a country's

overall development and its health performance in particular, is highly appreciated in the literature (Stigler, 1987; Nickell, 1996; Schumpeter, 1942; Easterly and Levine, 2000; North, 1990; Acemoglu, Naidu, Restrepo, and Robinson, 2014; World Development Report, 2002), it is widely recognized that competition per se, if not buttressed by certain institutions (e.g., rule of law, enforcement agencies, etc.), not only fails to produce the right incentives for political and economic agents, but may actually lead to perverse outcomes (e.g., Popov 2007). In fact, this is exactly the institutional trap that many post-communist countries fell into at their early transition stages, namely, cut-throat political and economic competition was already in place, while both promoting and constraining institutions were still absent.

Popov (2007) theorizes the following:

'It is precisely this strong institutional framework that should be held responsible … for the relative success of radical reforms in EE [Eastern European] countries, especially in Central European countries, where strong democratic regimes and new market institutions emerged quickly' (p. 3).

In this paper, we argue that the best health results should be achieved when the process of building market institutions is coupled with the process of building institutions for political competitiveness, that is, democratization. Introducing competition, either political or economic, means that more players participate in the "game" now. However, if the rules of the game are ill defined and/or serve to the advantage of "the strongest", or are simply absent, the outcomes are distorted as well. Put simply, rampant competition without institutions easily transforms into an "unfair" contestation, creates certain loopholes for rent-seeking behavior, corruption, unjust workers' layouts, misallocation of resources, including human capital, and thus aggravates overall uncertainty. By this token, it is reasonable to argue that if institutions are built along one dimension (i.e., economic competition), but not the other (i.e., democratization), the existing loopholes in the sphere that lacks properly functioning institutions will be utilized to their maximum capacity, and overall outcomes will be inferior. For instance, even if both political and

economic competition are introduced, but institutions work properly only in the economic sphere (say, prices are liberalized, monopolies are broken, and competitiveness laws are adopted, but elections are marred with fraud to the extent that they become meaningless) politicians will most probably resort to their administrative capacity to distort the flow of both political and economic rents (the two are easily convertible) to their own advantage and to the detriment of the society as a whole. Precisely because competitiveness allows more people to take part in the process, the aggregate scope (say, the monetary expression of corruption) increases as well.

In this paper, we test a hypothesis that, all else equal, only the interaction of institutions for political and economic competitiveness positively affects health outcomes. Thus, we anticipate that the best health results should be achieved if a country simultaneously advances its institutions for political and economic competitiveness when the degree if uncertainty reaches its minimum, while the worst may be expected if neither is developed when uncertainty soars.

To illustrate our theory more vividly, we plot dynamic trends of development of institutions for both political and economic competitiveness (Figure 1). We identify several categories, including (a) advanced economic and democratic development, (b) low economic and democratic development, (c) low economic and high democratic development, and (d) average economic and moderate democratic development. Although the graphs seem to confirm our story, compelling conclusions can be drawn only after performing more rigorous tests that take into account other important factors, which we present in the next section.

[Figure 1 here]

Causal pathway: uncertainty reduces investment in health

Given the broad nature of liberalizing political-economic processes, it is difficult to discern one clear channel through which such changes might influence health outcomes. The most common causal pathways include rapid pace of transition, large-scale privatization and related high unemployment rates (Cornia and Paniccia, 2000; Stuckler, King and McKee 2009)[4]; stress caused by economic and political reforms (Brainerd, 2001; Leon and Shkolnikov, 1998);

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[4] However, the privatization-employment link is frequently challenged by scholars (see Earle and Gehlbach, 2011).

the collapse of the Soviet health system and poor quality of medical care (Balabanova et al., 2004; Ellman 1994); alcohol consumption (Leon et al 2010; Bhattacharya, Gathmann and Miller, 2011); ill-designed alcohol pricing policy (Treisman, 2010); impoverishment and rising social inequalities (Ivaschenko, 2005; Bobak et al., 1998).

On the one hand, it can be claimed that the absence of institutions for economic and political competitiveness might appear at the root of most processes that were earlier proved to influence health outcomes. In fact, as our empirical results demonstrate, if development of political and economic institutions takes divergent trajectories, their potential positive effects—if taken separately—are significantly reduced. Uninstitutionalized and, as a result, rampant and unfair competition penetrates systemic as well as individual levels and may affect health outcomes through various channels. However, we go further and attempt to identify the most plausible channels of influence. We hypothesize that uninstitutionalized political-economic liberalization will act first and foremost through the mechanism of uncertainty and the resulting under-investment in health capital. For example, Abbot, Wallace and Beck (2006) while analyzing the impact of the Chernobyl disaster on citizens in nearby areas come to the conclusion that "unlike in other disasters, the perception of uncertainty among informants is linked, not only to the incident itself, but also economic problems and the institutional disintegration of the USSR" (Abbot, Wallace and Beck, 2006: 119).

The external uncertainty in general has been demonstrated to adversely affect citizens' decision to invest in their own health (for example Asano and Shibata, 2011). The authors show through formal modeling that uncertainty about the efficiency of healthcare in the country tends to reduce citizens' stimuli to invest in their health. This is especially relevant to the post-communist states where healthcare systems performed poorly (Balabanova et al., 2004). We argue that divergent political and economic transformation paths increase the overall uncertainty among citizens, which discourages them from making long-term investments in health capital.[5]

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[5] There is a substantive literature on the link between political and macroeconomic instability and domestic and foreign investments. For a classic work on the negative association between political instability and investments see Alesina et al., 1996.

To make matters worse, this feeling of uncertainty about the future is coupled with the specific beliefs of a "Soviet man" whereby the state is solely responsible for a person's health, which induces fatalism and reduces incentives for investment in health (on ideology and healthy lifestyle in post-Soviet republics, see Cockerham et. al., 2006).[6]

Research Design and Data

      Data

Our main dependent variables are represented by both broad indicators such as life expectancy at birth as well as less aggregate health measures such as age standardized mortality by causes of death. It is important to calculate models for both sexes separately due to the extraordinary gender gaps in life expectancy as well as cause-specific mortality rates typical for Eastern Europe (Murray and Bobadilla, 1997; Weidner and Cain, 2003; Leon, 2011; Clark and Peck, 2012; Mackenbach, Karanikolos, and McKee, 2013). Life expectancy at birth is widely used as a reliable and easily interpretable indicator of mortality (see Preston, Heuveline and Guillot, 2001). Disaggregating health measures, although less reliable, allow better identification of intervening mechanisms through which socio-political processes influence health outcomes (Mackenbach, Hu and Looman, 2013).

We include death rates that are believed to be caused by social stress, uncertainty, and insecure living conditions. These are circulatory diseases and suicides. To avoid the effect of long-term chronic illness we take the mortality level at the age 0-64.

Data on life expectancy at birth by gender are collected for the time period, 1989-2011, from the World Health Organization (WHO) Health for All Database (http://data.euro.who.int/hfadb/) and, in case of the former USSR republics, supplemented by the Demoscope Database (http://demoscope.ru/weekly/pril.php).

Age standardized mortality data by causes of death are also extracted from the WHO Health for All Database. Age-standardization is performed using the direct method and the

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[6] Other studies confirm that people in post-Soviet Russia fail to promote their own welfare after the states stopped supplying it in the previous volumes (Abbott et al., 2006; Ashwin, 1998; Crotty and Crane, 2004; Yanitsky, 1999, 2000;).

European standard population. The database for causes of death fails to cover the whole period of observations for all countries in the sample, especially after 2011, therefore we chose to restrict the timeframe of analysis to 1989-2010.

The main independent variables of interest—institutions for political and economic competitiveness—are measured as Polity IV democracy score and competition policy indicator, respectively. Despite the existence of many alternative political regime measures, Polity IV, although with its own drawbacks, is most popular among scholars because of its extensive cross-country, time span coverage as well as its sensitive 21-point scale. The data are compiled by the Polity IV project (http://www.systemicpeace.org/polity/polity4.htm) and extracted from the Quality of Government dataset (Teorell, Samanni, Holmberg, and Rothstein, 2011) (http://www.qog.pol.gu.se/data/). The Polity2 index is normally distributed on a continuous scale from "strongly democratic" (+10) to "strongly autocratic" (-10). We followed Mackenbach, Hu, and Looman (2013) and rescaled the index to make it entirely positive ranging from 0 to 20.

The Competition policy indicator is one of the EBRD Transition Indicators (http://www.ebrd.com/russian/pages/research/economics/data/macro/ti_methodology.shtml) that was introduced in 1989 to assess country-specific progress in transition. For the purpose of this study, we employed an economic competition policy indicator that evaluates change from a rigid centrally planned economy to an industrialized market economy and that ranges from 1 to 4+. More specifically, 1 corresponds to no competition legislation and institutions; 2 corresponds to competition policy legislation and institutions set up, with some reduction of entry restrictions or enforcement action on dominant firms; 3 corresponds to some enforcement actions to reduce abuse of market power and to promote a competitive environment, including break-ups of dominant conglomerates and substantial reductions of entry restrictions; and 4 corresponds to significant enforcement actions to reduce abuse of market power and to promote a competitive environment; 4+ corresponds to standards and performance typical of advanced industrial economies, with effective enforcement of competition policy and unrestricted entry to most

markets (http://www.ebrd.com/pages/research/economics/data/macro/ti_methodology.shtml).

Consistent with our theory, competition policy is one of the two indices, along with governance and enterprise restructuring, that has an institutional flavor. All others (i.e., price liberalization, trade and Forex system, small- and large-scale privatization) reflect policy outcomes rather than certain political and economic institutions (EBRD Transition Report, 2013: 39). In our view, high scores on aggregated indices might be driven solely by high indices on policy implementation outcomes (e.g., privatization), which not only ignores the influence of institutions per se, but also might prompt a misleading interpretation. For example, privatizing a large state-owned enterprise does not automatically mean an increase in its efficiency to the benefit of the society at large unless fair competition and private property protection are institutionalized and enforced. On the other hand, the post-Soviet space abounds with the examples of formal institutions which, even if present, have failed to produce outcomes that are comparable to the West. To overcome this problem, our policy competition measure reflects both the presence of competition-promoting economic institutions and their effectiveness. For instance, introduction of certain institutions for political competitiveness in Azerbaijan in 1999 was recognized as a window-dressing for price controls, and the country received the lowest possible score of 1 (EBRD Transition Report, 1999).

To test our theory that institutions for both political and economic competitiveness should exert an important combined effect upon health outcomes, we created their interaction term by multiplying the democratization score and an economic policy competition indicator. To further test our specific causal pathway, we explore the association between investments in health (proxy by private health expenditures as a percentage by GDP) and certain stress-related health outcomes. We also controlled for a number of country characteristics that are found in the literature to associate with democracy, competition policy, and life expectancy, and, therefore, may act as confounders. We controlled for time-invariant confounders by using country-fixed effects models, and for time-variant confounders by explicitly including them in our regression

equations. The latter included logged income per capita (measured as natural logarithm of GDP per capita, PPP), education (average years of education), inequality (Gini household disposable income), armed conflict (number of conflicts in which the government of the country is involved), alcohol consumption (in equivalent liters of pure ethyl alcohol consumed per capita per year). All these variables are obtained from the harmonized international data sources. Alcohol consumption variable was compiled from World Health Organization (WHO) Health for All Database, whereas all other controls from the Quality of Governance Dataset (http://www.qog.pol.gu.se/data/).

In case of missing data for some variables, e.g., democracy scores, for the newly independent republics before 1991-1992 (former members of the Soviet Union, Yugoslavia, and Czechoslovakia), we ascribe them scores for the respective states before dissolution for three or four years preceding independence. For Albania, life expectancy data for the period from 2004 and later are unavailable; for Bosnia and Herzegovina there are no data on democratic performance after 1994. There are missing data within the time span for the causes of death, alcohol consumption, and education (especially in the Central Asian, Western Balkan, and Caucasian countries).

For Bosnia and Herzegovina, the data on democratization are available only for 1994; for Albania, data are available only for 2004. Although both countries are excluded from the table A3 in the Appendix, they are included into the final analysis. Bosnia and Herzegovina demonstrated growth in life expectancy for men from 69.2 to 74.2 years, and Albania - from 69.2 to 73.7 in 2004).

Albania and some Central Asian republics demonstrated an unexpected low level of mortality that can be explained by behavior specifics (Gjonca, Wilson, and Falkingham, 1997; Gjonca and Bobak, 1997) or underestimation (Wuhib et al, 2003; Boyle and Ferlay, 2005; Guillot et al, 2011; 2012; 2013). Thus, the real figures of life expectancy could be a bit lower. A similar situation with Albania and Middle Asia can be observed in Azerbaijan where there are

less risky behavior patterns—alcohol consumption (Wasserman and Varnik, 1998; Rehn, Room, and Edwards, 2001) and failures in statistics, especially in case of child mortality. More or less high life expectancy fluctuations in Georgia and Armenia are also explained by the underestimation of migration and overestimation of total country population (Badurashvili et al., 2001; Duthé et al., 2010). The similar problems are present in Bosnia and Herzegovina, Moldova, and probably in Albania.

Descriptive statistics on dependent and independent variables can be found in Appendix.

Methods

In recognition of the dynamic nature of the examined processes, we perform cross-section time-series regression analysis on the unbalanced panel data covering 29 countries over 23 years (1989-2011). For the whole time period, we use states in their modern borders with the exception of Serbia and Montenegro, for which the data are common until 1999 and separate thereafter (for "Serbia" and "Montenegro"). Although some models are run on a reduced sample—mostly due to the lack of data on certain dependent and control variables, especially for the former Yugoslavian and Central Asian Republics—our results stay intact.

To mitigate against omitted variable bias, we use most important confounders identified in the literature as well as country fixed effects clustered by states. To capture possible external shocks, we control for time trend (both as a continuous and dummy variable). Robust standard errors are calculated in order to tackle a heterogeneity and first-order autocorrelation problem (Wooldridge, 2006). Our main model takes the following form:

$$life\ expectancy\ (male\ and\ female)_{ij}$$
$$= \beta_0 + \beta_1 democracy_{ij} - \beta_2 competition_{ij} - \beta_3 interaction_{ij} - \beta_4 gni_{ij}$$
$$- \beta_5 confounders_{ij} + \beta_6 time_i + \beta_7 country\ dummies_i + \varepsilon_{ij}$$

where health outcome is measured by life expectancy at birth or age-adjusted specific-cause mortality rates, democracy is represented by a rescaled Polity score, economic competition is represented by EBRD transition economic policy indicator, *gni* refers to GDP per capita, PPP, logged. Other confounders include average years of schooling, numbers of armed conflicts,

alcohol consumption, and income inequality for most model specifications. Time is represented by time trend or time dummies, country dummies control for unobserved confounding, and subscripts i and j represent time and country.

To check for our causal pathway, we attempt to assess the influence of degree of uncertainty (proxied as interaction term between economic liberalization and democratization) on a) stress-related health outcomes (proxied as mortality from cerebrovascular diseases and suicides because they are believed to be caused by stress) and b) investments in health capital (private health expenditures as % of GDP). Indeed, the specialists in occupational sciences showed the high role of uncertainty as a trigger of stress (Bodensteiner, Gerloff and Quick 1989;Pollard, 2011). Also, stress was shown to account for much mortality crisis in the post-Soviet space (e.g., see Leon and Shkolnikov, 1998, on Russia). To accommodate for such possibility, we use cardiovascular diseases (CVD) and suicides as our dependent variables. Men often react to stress with hostility, anger and violence abuse, women react with anxiety and adverse moods (Aneshensel et al., 1991) that are important causes of CVD and suicides (e.g., Cougle et al 2009; Gullette et al, 1997; Pickering, 2001). Our results confirm that uncertainty played a significant role in impacting health outcomes in post-communist countries.

$$
\begin{aligned}
cause &- specific\ mortality_{ij} \\
&= \beta_0 + \beta_1 democracy_{ij} + \beta_2 competition_{ij} - \beta_3 interaction_{ij} - \beta_4 gni_{ij} \\
&+ \beta_5 confounders_{ij} + \beta_6 time_i + \beta_7 country\ dummies_j + \varepsilon_{ij}
\end{aligned}
$$

Results

Table 1 presents results for the benchmark models with the dependent variable—life expectancy at birth for males and females. Generally, competition policy and democracy are negatively related to life expectancy, while their interaction, as hypothesized, exerts a strong statistically significant effect and is positively signed.

[Table 1 here]

Figure 2 illustrates marginal effects of institutions for political competitiveness (i.e., democracy) at different stages of institutionalized economic competitiveness. Substantively, if

16

institutions for economic competiveness are not developed, democracy does not influence life expectancy. However, if economic competition policy receives the highest possible score of 4, a one unit increase in democracy leads to 0.4 increase in life expectancy, all else equal. In other words, if Belarus with economic policy competition assessed at 2 and democracy at 3 as of 2011 becomes fully democratic (receives a score of 20), its people can gain 2 extra years of life.

[Figure 2 here]

The discovered negative association between democracy and life expectancy might be attributed to increased uncertainty (i.e., higher probability of reforms reversal due to political backlash) as well as to short-term political goals that at times of transitions often overrode the economic interests of the society (e.g., Firdmuc, 2003). The negative effect of institutions for liberalizing economic reforms may be explained by the partial nature of reforms with these very institutions protecting rents and property rights of the "early winners" (e.g., oligarchs, rather than society as a whole) (Hellman, 1998). Such reforms may have had detrimental effect upon economic development and, as a result, upon health outcomes. The only control variable that gained statistical significance is a proxy for inequality implying that, all else equal, a larger income gap in the society reduces male life expectancy.

Table 2 presents TSCS regression analysis with stress-related indicators. As predicted by our theoretical propositions, the interaction term exerts statistically significant and negative impact upon both circulatory system diseases and suicides even after controlling for numerous confounders. Substantively, the higher the level of uncertainty created by the mismatch of institutionalization in political and economic spheres, the higher the death rates caused by CVD and suicides.

[Table 2 here]

The effect of interaction between democratization and economic liberalization on the healthcare expenditures (see Table 3) is positive and significant for total health expenditures by PPP and private health expenditures as a % of GDP[7].

We take courage and interpret these results as tentative evidence for our proposition that uncertainty created by divergent paths of democratization and economic liberalization reduces citizens' stimuli to invest in health.

[Table 3 here]

Robustness checks

We tested the robustness of our models by including additional confounders such as spirits consumption (40% of pure alcohol equivalent) as opposed to the total alcohol consumption (Leon et al., 2010; Zaridze et al., 2009) and tertiary education enrollment instead of average years of schooling[8]. We also experimented with certain lags and different regression models (specifically, we estimate alternative models by feasible generalized least squares (FGLS).

In the model specifications below we control for spirits consumption (40% of pure alcohol equivalent) as opposed to total alcohol consumption. The rationale behind is that it is spirits consumption that is often considered most detrimental for certain health indicators (e.g., Leon et al., 2010; Zaridze et al., 2009; 2014). We report our results in Table 4. The independent variables of interest retain their sign and statistical significance.

[Table 4 here]

Models in Table 5 essentially replicate those in Table 4, but utilize cause-specific mortality rates as dependent variables. The results for the interaction term largely stay robust after including spirits consumption into the model.

[Table 5 here]

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[7] We choose to take institutional variables with 5-year lag because healthcare reform is a long-term process. Also, the reliable data on healthcare expenditures are available only since 1995.
[8] In the Soviet Union, life expectancy of people with tertiary education was increasing, while the total life expectancy was decreasing (Vishnevsky and Shkolnokov, 1997).

Models in Table 6 demonstrate the positive and statistically significant effect of the interaction term between democratization and economic competition on life expectancy after we control for tertiary education enrollment instead of average years of schooling.

[Table 6 here]

As an additional robustness check, we re-estimate our main models using FGLS (Feasible General Least Squares) that also tackles heteroskedasticity and autocorrelation problems present in the data. Table 8 shows that for the large part the impact of our variables of interest as well as their interaction term stay robust to different model specifications.

[Table 7 here]

The interaction term within FGLS models that utilize cause-specific mortality rates as dependent variables retains the predicted sign and statistical significance in most model specifications with only few exceptions when it becomes only marginally significant (see Table 8).

[Table 8 here]

Since the effect of institutions for political and economic competitiveness on health outcomes might not be immediate, it is necessary to re-estimate our models with lagged independent variables. We specify two models lagging our main independent variables by 1 year and 3 years (see Table 9 given 1) the rapid institutional building in post-communist states, and 2) short observation time span in our models. For the most part, the results remain unchanged.

[Table 9 here]

Reaching Out to Broader Political Context

Our study also complements the broader political science literature on the so-called "hybrid" regimes (see Levitsky and Way (2002) for a comprehensive review). We abstain here from the debate on what exactly constitutes such regimes, and for the purpose of this paper it suffices to note that two important features—institutional deficit and/or presence of certain features that undermine otherwise "meaningful" formal institutions—are recognized as a central

feature of such political regimes (Gerring et al., 2012; Levitsky and Way, 2002; Keefer 2007). Such features often imply massive electoral fraud (e.g., intimidation, ballot stuffing, other types of manipulations by authorities), human rights violation, media censorship, protection of the political status quo by illegal means, state capture by vested interests, and others (Levitsky and Way, 2010).

This conceptualization seems highly relevant for studying post-communist transitions, which are of primary interest for this paper, because the Post-Soviet space can be rightly called the champion among other world regions in hosting hybrid regimes. Seven in Central Europe (Albania, Bulgaria, Croatia, Macedonia, Romania, Serbia, Slovakia) and six in the former Soviet Union (Armenia, Belarus, Georgia, Moldova, Russia, Ukraine) were categorized as competitive authoritarian regimes at certain times in their history (most of them either became or already were competitive authoritarian between 1990 and 1995) (Levitsky and Way, 2010).

Our contribution to this literature is two-fold. First, our results confirm the theoretical predictions that hybrid regimes often fail to reach efficiency in public policies, in particular, in reaching optimal health outcomes. More importantly, given that "hybrid regimes" appear at stable equilibrium (Levitsky and Way, 2010), which characterizes by the high degree of uncertainty, the prospects for health outcomes under such regimes remain doomed. Second, we identify an additional institutional shortfall of such regimes. Not only is it of importance that institutions for economic and political competitiveness are absent or act as a mere disguise for protecting "the privileged", but also that a mismatch in the pace of building these institutions matters.

Our empirical results predict that the failure of many post-communist countries to build simultaneously competitive political and economic institutional infrastructure is responsible for undesirable health outcomes. Consistent with our conclusions, the "hybrid" regimes are repeatedly shown to fare worse on many other public policy outcomes in comparison to their democratic and, in some cases, even authoritarian counterparts. They are more prone to

heightened corruption (see Rock, 2008), to clientelism and policy noncredibility (Keefer, 2007), violence, and state failure (Gates et al, 2006; Robertson, 2007; Snyder and Mansfield, 1995).

Limitations

The most important empirical result of the paper is establishing the statistical significance of the effect on health in the post-communist countries of uncertainty measured as the interaction between institutionalized political and economic competitiveness. To test the hypothesis, the panel-structured data and appropriate methods were employed. However, there are several important limitations to our analysis. First, reservations should be made about the choice of dependent variables and their reliability. Life expectancy data are subject to temporal effects and specific-cause mortality rates are of questionable quality (Mackenbach, Hu, and Looman, 2013). However, we hope the fact that our results are robust to using several alternative dependent variables mitigates against this drawback. Second, the data on both dependent and independent variables contain missing values. To economize on space, we discuss these problems and how we deal with them in greater detail in Appendix. Third, there is a possibility that the effect of the reforms is not immediate. Empirically, we partially handle the problem by lagging our independent variables by 1 and 3 years (see also Appendix). Fourth, in this paper we focus on post-communist states as opposed to the whole world, which limits generalizability of our results. We prefer to view this as a strength of our study: post-communist transitions present a unique historical experiment to test efficiency of simultaneous political and economic reforms. Future researchers, however, are precluded from further extrapolating these results without additional empirical testing. Lastly, we admit that our proxy for investments in health capital - private health expenditures as a % of GDP – is not an ideal measure because it depends on other factors such as healthcare system design, healthcare policy etc. We hope to at least partly mitigate this problem by including fixed effects in every model. Yet, this conclusion warrants corroboration in further quantitative and qualitative research.

Conclusions and Policy Implications

Our results suggest that promoting simultaneously institutionalized political and economic competitiveness is crucial for improving health in the post-communist countries. We have shown empirically that, all else being equal, building institutions for political and economic competitiveness simultaneously results in the best health outcomes. Maintaining the assumption that uninstitutionalized competitiveness, either political or economic, leads to inferior social outcomes (e.g., corruption, clientelism, stagnation), we argue that building institutions for political and economic competition should go hand in hand in order to achieve Pareto-optimality in social outcomes, specifically, population health. Absence of one of the proposed institutions invariably impedes or even prevents completely the functioning of the other and thereby raises overall uncertainty. 'When governments are unconstrained by institutionalized competition, they (and the public officials within them) will structure economic institutions so as to maximize short-run government revenues and/or permit rent-seeking by public officials' (Haber, 2008, p. 48).

These processes reveal a strong positive and highly significant reinforcement effect upon different dimensions of health. The policy implications are clear. First, policy makers should not underestimate the role of institutions. Second, when designing policies, they should foresee the interaction effects of certain institutional choices so that a failure in one realm will not spillover to and nullify achievements in the other. Although some might think that the era of transitions has come to an end, the surprisingly stable "hybrid" regimes that lack institutionalization as well as recent events in Ukraine prove institutional building to be a bare necessity of the future rather than that of the past. If these countries are "stuck in transition" (EBRD Transition Report, 2013) and therefore surrounded by uncertainty, does it also mean that they are stuck with bad health?

Apart from this question, future studies should appreciate the fact that institutions do not exist in a vacuum and probably interact with other institutions, which defines or at least modifies their effect upon policy outcomes including population health. Moreover, other political and

economic institutions that might influence the degree of economic and political competitiveness vary across post-communist countries, e.g., presidential versus parliamentary government systems, different electoral formulas, or different degrees of enforcement power vested into economic competition agencies. Also, our hypothesis can be tested on a broader cross-section time-series dataset.

References

Abbott, Pamela, Wallace, Claire, and Matthias Beck (2006). Chernobyl: Living with risk and uncertainty. *Health, Risk & Society,* 8: 105-121.

Acemoglu, D., Naidu, S., Restrepo, P., & Robinson, J. A. (2014). Democracy does cause growth. NBER working paper № 20004.

Alesina, A., Ozler, S., Roubini, N. And Swagel, P. (1996). Political instability and economic growth. *Journal of Economic Growth*, 1, 189–211.

Aneshensel, C. S., Rutter, C. M., & Lachenbruch, P. A. (1991). Social structure, stress, and mental health: Competing conceptual and analytic models. *American Sociological Review*, 56, 166–178.

Asano, Takao, and Akihisa Shibata (2011). Risk and uncertainty in health investment. *European Journal of Health Economics*, 12: 79-85.

Badurashvili, I., McKee, M., Tsuladze, G., Meslé, F., Vallin, J., & Shkolnikov, V. (2001). Where there are no data: what has happened to life expectancy in Georgia since 1990? *Public Health,* 115(6), 394-400.

Balabanova, D., McKee, M., Pomerleau, J., Rose, R. & Haerpfer, C. (2004). Cross-country comparisons. Health service utilization in the former Soviet Union: evidence from eight countries. *Health Services Resources*, 39, 1927–50.

Balzerowicz, L. 1994. Understanding Postcommunist Transitions. *Journal of Democracy* 5 (4): 75-89.

Baum, M. A., & Lake, D. A. (2001). The invisible hand of democracy: political control and the provision of public services. *Comparative Political Studies,* 34 (6), 587–621.

Bhattacharya, J., Gathmann Ch., Miller G. 2013. The Gorbachev Anti-Alcohol Campaign and Russia's Mortality Crisis. *American Economic Journal: Applied Economics*, 5(2): 232-60.

Besley, T. J., & Kudamatsu, M., (2006). Health and democracy. *American Economic Review,* 96(2), 313–318.

Bobak, M., Hertzman, C., Skodova, Z., Marmot, M. (1999). Socioeconomic status and cardiovascular risk factors in the Czech Republic. *International Journal of Epidemiology,* 28, 46–52.

Bobak, M., Marmot, M. (1996). East-West mortality divide and its potential explanations: proposed research agenda. *British Medical Journal*, 312, 421-425.

Brainerd E. (2001). Life and death in Eastern Europe: Economic reform and mortality in the former Soviet Union: a study of the suicide epidemic in the 1990s. *European Economic Review,* 45, 1007–19.

Boyle, P., & Ferlay, J. (2005). Cancer incidence and mortality in Europe, 2004. *Annals of Oncology*, 16, 481–488.

Bunce V. (1993). Elementy neopredelennosti v perekhodnyi period [Elements of Uncertainty During Transition]. Polis, 1, 44-51.

Clark, R., & Peck, B. M. (2012), Examining the gender gap in life expectancy: a cross-national analysis, 1980–2005. *Social Science Quarterly*, 93, 820–837.

Cockerhamam W. C., Hinotea B. P., Abbott P. Psychological distress, gender, and health lifestyles in Belarus, Kazakhstan, Russia, and Ukraine *Social Science & Medicine,* 63 (9), 2381–2394.

Cornia, G. A, Paniccia R. (2000). *The mortality crisis in transitional economies*. Oxford. Oxford University Press.

Dabrowski, M., Gortat R. (2002), Political determinants of economic reforms in former communist countries. *Studies and Analyses* CASE № 242.

De Melo, M., Denizer, C., & Gelb, A. (1996). Patterns of transition from plan to market. World Bank Economic Review, 10(3), 397-424.

Duthé, G., Badurashvili, G., Kuyumjyan, K., Meslé, F., & Vallin, J. (2010). Mortality in the Caucasus: an attempt to re-estimate recent mortality trends in Armenia and Georgia. *Demographic Research,* 22(23), 691–732.

Earle, John S., and Scott Gehlbach. (2011). Did Post-communist Privatization Increase Mortality? *Comparative Economic Studies* 53 (2): 239-260.

Easterly, W., & Levine, R. (2000). It's not factor accumulation: stylized facts and growth models. World Bank, Washington, D.C. Processed.

EBRD Transition Report (1995). Investment and enterprise development. London: EBRD, 1995.

EBRD Transition Report (1999). Ten years of transition? London: EBRD, 1999.

EBRD Transition Report (2013). Stuck in transition? London: EBRD, 2013.

Fidrmuc, J. (2003). Economic reform, democracy and growth during post-communist transition. *European Journal of Political Economy (Special issue on Economic Freedom),* 19, 583–604.

Fish, M. S., & Choudhry, O. (2007). Democratization and economic liberalization in the postcommunist world. *Comparative Political Studies*, 40(3), 254-282.

Franco, A., Alvarez-Dardet, C., & Ruiz, M. T. (2004). Effect of democracy on health: ecological study. *British Medical Journal,* 329(7480), 1421–1423.

Gates, S., Hegre, H., Jones, M. P., & Strand, H. (2006). Institutional inconsistency and political instability: polity duration, 1800-2000. *American Journal of Political Science, 50*(4), 893-908.

Gerring, J., Thacker, S. C., & Alfaro, R. (2012). Democracy and human development. *Journal of Politics,* 74(1), 1–17.

Ghobarah, H. A., Huth, P., & Russett, B. (2004). Comparative public health: the political economy of human misery and well-being. *International Studies Quarterly,* 48(1), 73-94.

Giavazzi, F., & Tabellini, G. (2005). Economic and political liberalizations. *Journal of Monetary Economics,* 52(7), 1297- 1330.

Gjonça, A., Bobak, M. (1997). Albanian paradox, another example of protective effect of Mediterranean lifestyle? *The Lancet*, 9094(350), 1815 – 1817.

Gjonca, A., Wilson, C., & Falkingham, J. (1997). Paradoxes of health transition in Europe's poorest country: Albania 1950-90. *Population and Development Review,* 23 (3) , 585-609.

Gullette E. C. D., J. A. Blumenthal, M. Babyak, W. Jiang, R. A. Waugh, D. J. Frid, C. M. O'Connor, J. J. Morris, D. S. Krantz (1997) Effects of Mental Stress on Myocardial Ischemia During Daily Life. *Journal of the American Medical Association.,* 277(19):1521-1526.

Guillot, M., Gavrilova, N., & Pudrovska, T. (2011) . Understanding the 'Russian mortality paradox' in Central Asia: evidence from Kyrgyzstan. *Demography,* 48(3), 1081–1104.

Guillot, M., Gerland, P., Pelletier, F., & Saabneh, A. (2012). Child mortality estimation: A global overview of infant and child mortality age patterns in light of new empirical data. *PLoS Medicine,* 9(8), e1001299.

Guillot, M., Lim, S., Torgasheva, L., & Denisenko, M. (2013). Infant mortality in Kyrgyzstan before and after the break-up of the Soviet Union, population studies. *A Journal of Demography,* 67(3), 335-352.

Haber, S. H. (2008). Political Institutions and Financial Development: Evidence from the Political Economy of Bank Regulation in the United States and Mexico. In S. Haber, D. C. North, & B. R. Weingast (Eds.), *Political Institutions and Financial Development* (pp. 10-59). Stanford University Press.

Hellman, Joel S. (1998). Winners Take All: The Politics of Partial Reform in Postcommunist Transitions. *World Politics* 50: 203-34.

Heuveline, P., & Guillot, M. (2001). *Demography. Measuring and modeling population process.* Oxford. Blackwell Publishing.

Ivaschenko, O. (2005).The patterns and determinants of longevity in Russia's regions: evidence from panel data*. Journal of Comparative Economics,* 33, 788–813.

Keefer, P. (2007). Clientelism, credibility, and the policy choices of young democracies. *American Journal of Political Science*, *51*(4), 804-821.

Lake, D. A., & Baum, M. A. (2003). The political economy of growth: democracy and human capital. *American Journal of Political Science,* 47(2), 333–47.

Leon, D. A. (2011). Trends in European life expectancy: a salutary view. *International Journal of Epidemiology,* 40, 271–277.

Leon, D. A., & Shkolnikov, V. M. (1998). Social stress and the mortality crisis. *JAMA*, 279, 790–91.

Leon, D. A., Shkolnikov, V. M., McKee, M., Kiryanov, N., & Andreev, E. (2010). Alcohol increases circulatory disease mortality in Russia: acute and chronic effects or misattribution of cause? *International Journal of Epidemiology*, 39 (5), 1279-1290.

Levitsky, S., & Way, L. A. (2002). The rise of competitive authoritarianism. *Journal of Democracy*, *13*(2), 51-65.

Levitsky, S., & Way, L. A. (2010). *Competitive Authoritarianism: International Linkage, Organizational Power, and the Fate of Hybrid Regimes.* New York: Cambridge University Press.

Lin, R. T., Chen, Y. M., Chien, L. C., & Chan, C. C. (2012). Political and social determinants of life expectancy in less developed countries: a longitudinal study. *BMC Public Health*, 12, 85.

Mackenbach, J. P., Hu, Y., & Looman, C. W. N. (2013). Democratization and life expectancy in Europe, 1960-2008. *Social Science & Medicine*, 93, 166-175.

Mackenbach, J. P., Karanikolos, M., & McKee, M. (2013). Health policy in Europe: factors critical for success. *British Medical Journal*, 346-351.

Marmot, M., Bobak, M. (2000). Psychosocial and biological mechanisms behind the recent mortality crisis in Central and Eastern Europe. In G. A. Cornia, & R. Paniccia (Eds.), *The*

mortality crisis in transitional economies (pp. 127-148). Oxford: Oxford University Press.

McGuire, J. W. (2013). Political regime and social performance. *Contemporary Politics,* 19(1), 55–75.

Melzyg, R., Pleva, P., & Sprout, R. (2005). Economic reforms, democracy and growth in Eastern Europe and Eurasia. *Working Paper Series on the Transition Countries*. Washington, DC: Program Office, Bureau for Europe & Eurasia, U.S. Agency for International Development.

Muntaner, C., Borrell, C., Ng, E., Chung, H., Espelt, A., Rodriguez-Sanz, M., et al. (2011). Politics, welfare regimes, and population health: controversies and evidence. *Sociology of Health & Illness,* 33, 946-964.

Murray, C. J., & Bobadilla, J. L. (1997). Epidemiological transitions in the formerly socialist economies: divergent patterns of mortality and 11 causes of death. In J. L. Bobadilla, C. Costello, & F. Mitchell (Eds.), *Premature death in the New Independent States* (pp. 184–219). Washington, DC: National Academy Press.

Nickell, S. J. (1996). Competition and corporate performance. Journal of Political Economy, 104(4), 724–46.

North, D.C. (1990). Institutions, institutional change and economic performance. Cambridge University Press.

Pande, A. (2003). Taking time and space into consideration: correcting Zweifel and Navia's (2000) model on the effect of regime on infant mortality rates. Unpublished manuscript.

Pickering, T. G. (2001) Mental Stress As a Causal Factor in the Development of Hypertension and Cardiovascular Disease Current Hypertension Reports, 3:249–254.

Popov, V. (2007). Shock therapy versus gradualism reconsidered: lessons from transition economies after 15 years of reforms. Comparative Economic Studies, 49, 1–31.

Preston, S., Heuveline, P. and Guillot, M. (2001) Demography: Measuring and Modeling Population Processes.

Rehn, N., Room, R., & Edwards, G. (2001). Alcohol in the European Region − consumption, harm and policies by. World Health Organization Regional Office for Europe.

Robertson, G. B. (2007). Strikes and labor organization in hybrid regimes. *American Political Science Review*, *101*(4), 781-798.

Rock, M. (2008). Corruption and Democracy. *Journal of Development Studies*, 45(1), 55-75.

Ross, M. L. (2006). Is democracy good for the poor? *American Journal of Political Science, 50*(4), 860–874.

Schumpeter, J. A. (1942). *Capitalism, socialism and democracy.* New York, NY. Harper Torchbooks.

Shandra, J. M., Nobles, J., London, B., & Williamson, J. B. (2004). Dependency, democracy, and infant mortality: a quantitative, cross-national analysis of less developed countries. *Social Science and Medicine, 59*(2), 321–333.

Shkolnikov, V. M., Cornia, G. A., Leon, D. A., & Mesle´, F. (1998). Causes of the Russian mortality crisis: evidence and interpretations. *World Development*, 26(11), 1995–2011.

Snyder, J., & Mansfield, E. (1995). Democratization and the danger of war. *International Security, 20*, 5-38.

Staehr, K. (2006). Linkages between political and economic reforms in post-communist countries. *Nordic Journal of Political Economy*, 32(2), 113-138.

Stigler, G. J. (1987). Competition. In J. Easwell, M. Milgate, & P. Newman (Eds.), *The New Palgrave*. London: MacMillan.

Stuckler, D., King, L., & McKee, M. (2009). Mass privatisation and the postcommunist mortality crisis: a cross-national analysis. *Lancet*, 373(9661), 399-407.

Sun, Y., & Johnston, M. 2010. Does Democracy Check Corruption? Insights from China and India. *Comparative Politics*, 42(2), 1–19.

Teorell, J., Charron, N., Dahlberg, S., Holmberg, S., Rothstein, B., Sundin, P. & Svensson, R. (2013). *The quality of government basic dataset made from the QoG standard dataset.* Version 15, May 2013. University of Gothenburg: the quality of government institute.

Treisman, Daniel. (2010). Death and prices. The political economy of Russia's alcohol crisis. *Economics of Transition* 218 (2): 281–331.

Vishnevsky, A., Shkolnikov, V. (1997). Smertnost v Rossii. Glavnie gruppy riska I prioritety deystvia. Moscow Carnegie Centre Reports. Moscow. 19.

Vollmer, S., & Ziegler, M. (2009). Political institutions and human development: does democracy fulfill it's "constructive" and "instrumental" role? Policy Research Working Paper № 4818, World Bank, Washington, DC.

Wasserman, D., Varnik, A. (1998). Suicide-preventive effects of *perestroika* in the former USSR: the role of alcohol restriction. *Acta Psychiatr Scand,* 98(394), 1-4.

Weidner, G., & Cain, V. S. (2003). The gender gap in heart disease: lessons from Eastern Europe. *American Journal of Public Health*, 93 (5), 768-770.

Wigley, S., & Akkoyunlu-Wigley, A. (2011). The impact of regime type on health: does redistribution explain everything? *World Politics*, 63(4), 647-677.

Wooldridge, J. M. (2006). *Introductory econometrics. A modern approach*. Mason, OH: Thomson/South-Western.

World Bank, 2013. *World development indicators online.* Washington, DC: The World Bank Group.

World Bank. 2002. *World Development Report 2002: Building Institutions for Markets.* Washington, DC: Oxford University Press.

Wuhib, T., McCarthy, B. J., Chorba, T. L., Sinitsina, T. A., Ivasiv, I. V., & McNabb, S. J. N. (2003). Underestimation of infant mortality rates in one republic of the former Soviet Union . *Pediatrics*, 111.

Zaridze, D., Brennan, P., Boreham, J., Boroda, A., Karpov, R., Lazarev, A., Konobeevskaya, I., Igitov, V., Terechova, T., Boffetta, P., Peto, R. (2009). Alcohol and cause-specific mortality in Russia: a retrospective case–control study of 48 557 adult deaths. *Lancet* , 373, 2201–14.

Zaridze, D., Lewington, S., Boroda, A., Scélo, G., Karpov, R., Lazarev, A., Konobeevskaya, I., Igitov, V., Terechova, T., Boffetta, P., Sherliker, P., Kong, X., Whitlock, G., Boreham, J., Brennan, P., Peto, R. (2014). Alcohol and mortality in Russia: prospective observational study of 151000 adults. *Lancet,* 383, 9927, 1465–1473.

Zweifel, Th., & Navia, P. (2003). Democracy, dictatorship, and infant mortality revisited. *Journal of Democracy,* 14(3), 90–103.

List of Tables

Table 1.

Transition and Life Expectancy: Results of Fixed Effects Regression Models

	(1) Male	(2) female	(3) male	(4) female	(5) Male	(6) female
Economic Comp	-1.272	-1.437**	-1.253	-1.450**	-1.904**	-1.602***
	(1.155)	(0.590)	(1.308)	(0.661)	(0.828)	(0.409)
National income (gdp)			0.835	0.687	0.840	0.189
			(0.912)	(0.523)	(1.045)	(0.490)
Interaction term (econ+polit)	**0.130****	**0.122*****	**0.114***	**0.115*****	**0.135*****	**0.120*****
	(0.0538)	**(0.0262)**	**(0.0606)**	**(0.0280)**	**(0.0432)**	**(0.0241)**
Polit Comp (democracy)	-0.172**	-0.159***	-0.117	-0.128***	-0.153**	-0.172***
	(0.0746)	(0.0457)	(0.0773)	(0.0438)	(0.0649)	(0.0458)
Inequality					-0.0516	-0.00173
					(0.0388)	(0.0162)
Education					-0.772	-0.642
					(1.016)	(0.646)
Alcohol consumption					-0.0393	-0.0154
					(0.0569)	(0.0326)
Armed conflicts					-0.357	-0.0980
					(0.219)	(0.127)
Constant	68.15***	75.60***	61.04***	69.75***	70.22***	80.64***
	(1.400)	(0.793)	(8.309)	(4.633)	(13.11)	(6.897)
R^2	568	568	504	504	376	376
Observations	0.520	0.687	0.538	0.699	0.624	0.765
Number of countries	29	29	29	29	26	26

For all tables robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 2.

Transition and Cause-Specific Mortality: Regression Models (with Different Confounders as a Control Variable).

VARIABLES	circulatory male	circulatory female	suicides male	suicides female
Economic Comp	29.27	11.09*	6.386*	1.188*
	(17.43)	(6.371)	(3.442)	(0.599)
National income (gdp)	-63.67***	-21.72***	-9.400	-0.903
	(22.17)	(6.590)	(6.071)	(1.145)
Interaction term (econ+polit)	**-3.081***	**-1.021***	**-0.596**	**-0.132***
	(0.963)	**(0.338)**	**(0.230)**	**(0.0425)**
Polit Comp (democracy)	3.707**	1.295**	1.000**	0.239***
	(1.772)	(0.599)	(0.436)	(0.0780)
Inequality	68.16***	19.99***	-0.900	0.0638
	(23.50)	(6.661)	(6.401)	(1.345)
Education	1.495	0.539	-0.618**	-0.0373
	(1.306)	(0.479)	(0.276)	(0.0556)
Alcohol consumption	0.227	0.183	-0.0846	-0.0137
	(1.032)	(0.259)	(0.248)	(0.0475)
Armed conflicts	8.441*	3.933**	2.252**	0.055
	(4.231)	(1.416)	(0.989)	(0.158)
Constant	53.34	69.50	120.5	14.23
	(301.2)	(92.83)	(80.77)	(13.40)
Observations	356	356	356	356
R-squared	0.514	0.681	0.556	0.613
Number of countries	25	25	25	25

Table 3.

Transition (with 5 years lag) and health care expenditures

VARIABLES	(1) Private	(2) Public	(3) Total (by PPP)
Economic Comp	-0.839**	-0.712**	-100.4
	(0.340)	(0.309)	(59.75)
National income (gdp)	-0.998	0.0803	-194.2
	(0.804)	(0.488)	(122.4)
Interaction term (econ+polit)	0.0375**	0.0286	8.934**
	(0.0147)	(0.0181)	(3.344)
Polit Comp (democracy)	-0.0790***	-0.0348	-11.67
	(0.0213)	(0.0274)	(7.260)
Inequality	-0.0325	-0.0118	-4.341
	(0.0198)	(0.0150)	(4.095)
Education	-0.0103	-0.00650	6.596**
	(0.00830)	(0.00834)	(3.009)
Alcohol consumption	-0.0308	0.0613	13.45*
	(0.0377)	(0.0396)	(7.321)
Armed conflicts	0.0676	0.0897*	-18.84
	(0.0881)	(0.0500)	(12.10)
Constant	13.45*	4.281	1,984*
	(6.921)	(4.567)	(1,006)
Observations	279	279	281
R-squared	0.294	0.234	0.893
Numberofcountries	23	23	23

Table 4.

Transition and life expectancy: regression models with spirits consumption as a control

VARIABLES	(1) male	(2) female
Economic Comp	-1.929**	-1.675***
	(0.835)	(0.426)
National income (gdp)	0.776	0.190
	(0.986)	(0.448)
Interaction term (econ+polit)	**0.136***	**0.125***
	(0.0443)	**(0.0251)**
Polit Comp (democracy)	-0.151**	-0.178***
	(0.0703)	(0.0470)
Inequality	-0.0520	-0.00171
	(0.0386)	(0.0153)
Education	-0.823	-0.615
	(1.048)	(0.625)
Spirits consumption	-0.0502	-0.0565
	(0.0712)	(0.0362)
	-0.364	-0.104
Armed conflicts		
	(0.215)	(0.123)
Constant	71.15***	80.57***
	(12.69)	(6.384)
Observations	376	376
R-squared	0.624	0.768
Numberofcountries	26	26

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5.

Transition and cause-specific mortality: regression models with spirits consumption as a control

VARIABLES	circulatory male	circulatory female	suicides male	suicides female
comp	29.81*	11.68*	6.746*	1.312**
	(16.81)	(6.091)	(3.514)	(0.619)
GNI	-59.45***	-20.30***	-11.28*	-1.042
	(20.10)	(5.866)	(6.360)	(1.168)
Interaction term (econ+polit)	**-3.099***	**-1.056***	**-0.630**	**-0.141***
	(0.912)	**(0.317)**	**(0.239)**	**(0.0436)**
polity	3.601*	1.298**	1.104**	0.256***
	(1.781)	(0.593)	(0.430)	(0.0756)
gini	70.56***	20.56***	-2.317	-0.0966
	(23.62)	(6.643)	(5.976)	(1.316)
education	1.446	0.740	-0.279	0.0390
	(1.863)	(0.737)	(0.323)	(0.0505)
Spirits consumption	0.250	0.194	-0.0898	-0.0133
	(1.050)	(0.260)	(0.257)	(0.0477)
Armed conflicts	8.565**	3.998***	2.230**	0.0592
	(4.080)	(1.349)	(1.027)	(0.154)
Constant	0.173	52.43	145.5*	16.28
	(277.0)	(82.74)	(78.54)	(13.54)
Observations	356	356	356	356
R-squared	0.511	0.681	0.537	0.613
Number of countries	25	25	25	25

Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6.

Transition and life expectancy: regression models (tertiary education)

VARIABLES	(1) Male	(2) Male	(3) Female	(4) Female
Economic Comp	-1.764*	-1.799*	-1.466**	-1.516***
	(1.008)	(0.985)	(0.527)	(0.525)
National income (gdp)	1.126	0.896	0.514	0.380
	(1.178)	(1.114)	(0.480)	(0.451)
Interaction term **(econ+polit)**	0.122**	0.123**	0.111***	0.114***
	(0.0509)	(0.0491)	(0.0294)	(0.0289)
Polit Comp (democracy)	-0.130	-0.125	-0.154***	-0.154***
	(0.0808)	(0.0834)	(0.0520)	(0.0534)
Inequality	-0.0314	-0.0347	-0.000284	-0.00295
	(0.0377)	(0.0383)	(0.0159)	(0.0156)
Education (tertiary)	0.00802	0.00501	0.0118	0.00975
	(0.0159)	(0.0171)	(0.00812)	(0.00892)
Alcohol consumption	-0.0885		-0.0631*	
	(0.0668)		(0.0340)	
Armed conflicts	-0.535**	-0.518**	-0.218	-0.208
	(0.228)	(0.226)	(0.138)	(0.134)
Spirits consumption		-0.0588		-0.0738
		(0.0851)		(0.0437)
Constant	59.96***	61.55***	71.99***	73.04***
	(11.28)	(10.84)	(4.356)	(4.133)
Observations	344	344	344	344
R-squared	0.690	0.685	0.829	0.827
Number of countries	24	24	24	24

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 7.

Transition and life expectancy: regression models for FGLS (only competition variables are shown)

| | Alcohol consumption | | Spirits consumption | |
	male	female	male	female
Economic Comp	-0.607	-0.881***	-0.905**	-1.040***
	(0.370)	(0.264)	(0.389)	(0.273)
Interaction term	**0.0227**	**0.0594***	**0.0462****	**0.0651***
(econ+polit)	**(0.0211)**	**(0.0152)**	**(0.0221)**	**(0.0154)**
Polit Comp	0.00772	-0.0580*	-0.0189	-0.0769**
	(0.0375)	(0.0300)	(0.0393)	(0.0301)

Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 8.

Significance of interaction term in models. DV- cause-specific mortality rates.

	Causes of death were the interaction is significant	
	TSCS	FGLS
All controls and alcohol consumption	*Circulatory (male)**** *Circulatory (female)**** *Suicide (male)*** Suicide (female)***	*Circulatory (male)**** *Circulatory (female)**** *Suicide (male)***
All control and spirits consumption	*Circulatory (male)**** *Circulatory (female)**** *Suicide (male)*** Suicide (female)***	*Circulatory (male)**** *Circulatory (female)**** *Suicide (male)***

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9.

*Significance of interaction term in models with different lags*

	Causes of death were the interaction is significant	
	1 year lag	3 years lag
All control and alcohol consumption	*Circulatory (male)**** *Circulatory (female)**** *Suicide (male)**** Suicide (female)**	*Circulatory (male)**** *Suicide (male)**** Suicide (female)***
All control and spirits consumption	*Circulatory (male)**** *Circulatory (female)**** *Suicide (male)**** Suicide (female)**	*Circulatory (male)**** *Suicide (male)**** Suicide (female)***

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

List of Figures
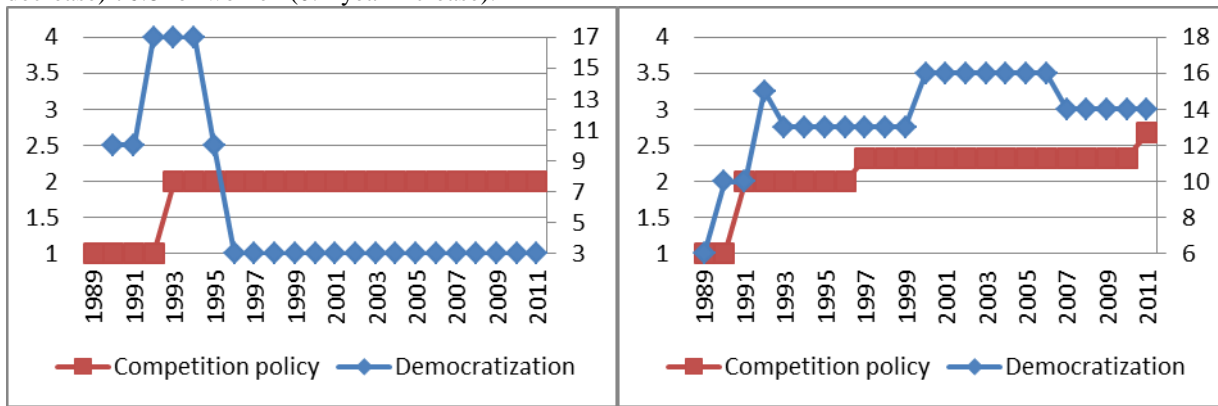
A. Economic and democratic development (high-high). Estonia (right) - life expectancy at 2011: 74.9 for men (5.4-year increase) and 81 for women (6.1-year increase). Hungary (left) - life expectancy (2011): 71.2 for men (6.0-year increase) 78.7 for women (5.0-year increase).
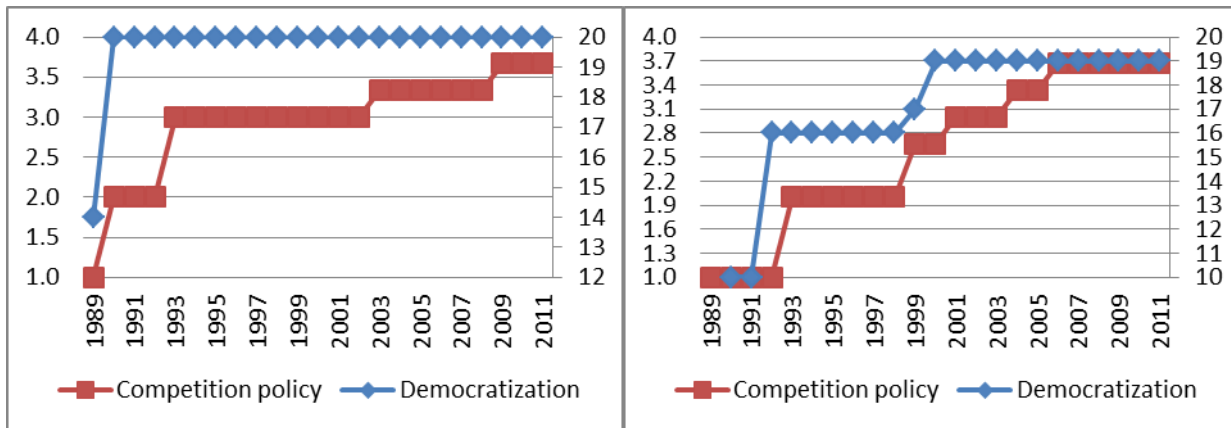
B. Economic and democratic development (low-low). Russia (right) Life expectancy at 2011: 64 for men (0.2-year decrease) 75.6 for women (1.1-year increase). Belarus (left) - life expectancy at 2011: 64.7 for men (2.0-year decrease) 76.8 for women (0.4-year increase).

C. Economic and democratic development (low-high). Ukraine (left) - life expectancy at 2011: 66.0 for men (0.1-year decrease) 76.0 for women (0.8-year decrease). Kyrgyzstan (right) - life expectancy at 2011: 63.4 for men (1.0-years decrease) 71.8 for women (0.7-year decrease).
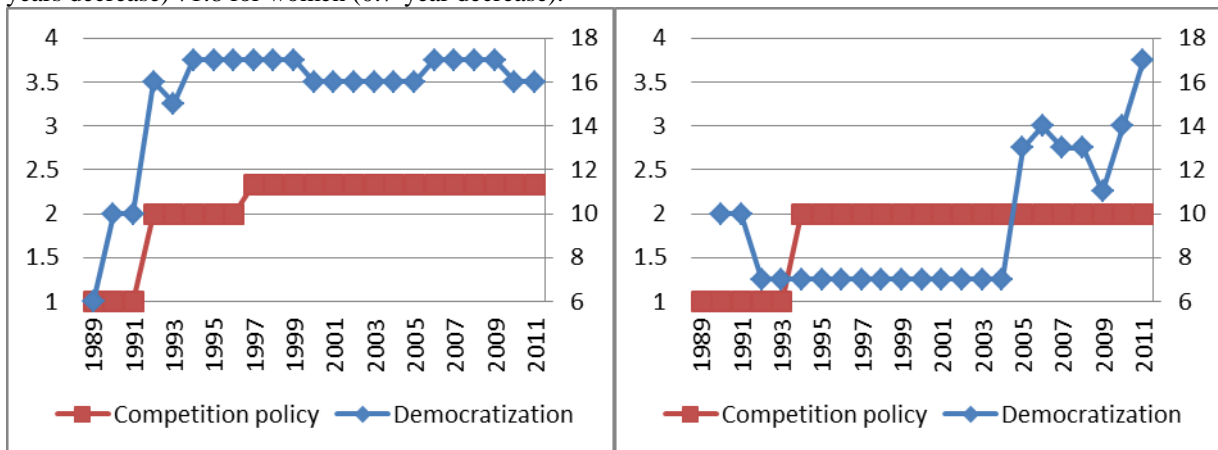
*Compatition policy ranged from 1 (no competition) to 4+ (highly competititve). Democratization ranges from 0 (autocracy) to 20 (democracy). Change in Life Expectancy at Birth is calculated since 1989 for all countries.

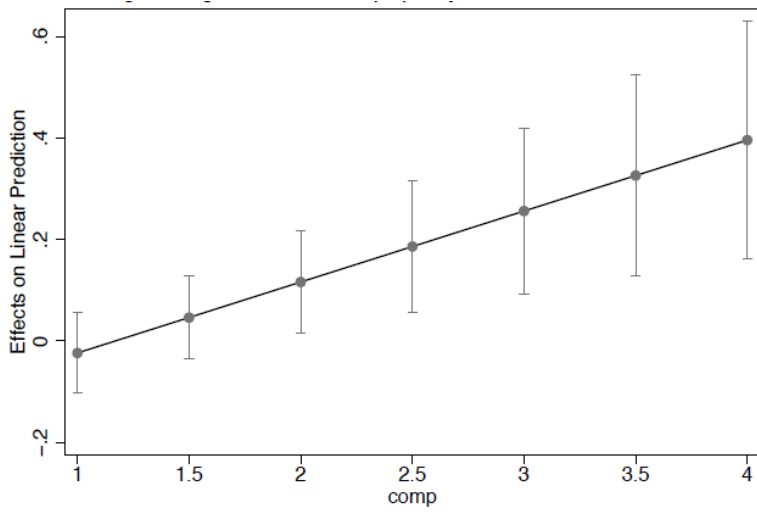*Figure 1.* Economic and democratic development by specific countries

Figure 2. Average marginal effects of institutions for political competitiveness with 95% confidence intervals.

Annex for the editor and referees

Data for the Model

Table A1.

Descriptive statistics of the variables used in the analysis

	Obs	Mean	Std. dev	Min	Max
Life expectancy male	624	67.10	3.89	56.40	76.80
Life expectancy female	624	75.20	2.98	66.58	83.30
Economic competition	676	1.93	0.75	1.00	3.70
National income (log)	577	8.70	0.77	6.78	10.21
Political competition	614	13.51	6.47	1.00	20.00
Gini (Household disposable income)	467	32.11	5.84	18.62	47.99
Average years of education	506	10.63	1.20	6.80	13.70
Alcohol consumption	585	7.73	4.18	0.32	16.87
Health expenditures per capita (USD PPP)	441	558.6206	486.91	22.26648	2551.559
Private health expenditures (% GDP)	437	2.588819	1.413596	0.4758539	7.923961
Public health expenditures (% GDP)	437	3.833697	1.609423	0.2672812	7.310545
Tertiary education enrollment	487	38.96317	18.74361	7.96547	89.58426
Spiritus consumption	584	3.39	2.28	0.00	14.44
Armed conflicts	574	0.17	0.52	0.00	3.00
Cause-specific mortality					
Circulatory female	545	232.50	84.95	54.42	462.73
Circulatory male	545	93.28	37.46	15.38	215.14
Suicides female	541	29.37	19.68	1.03	87.43
Suicides male	541	5.77	3.20	0.00	16.16

Table A2.

Life expectancy for several years

	1989		1999		2009	
	male	female	male	female	male	female
Albania	69.16	75.03	72.73	79.48		
Armenia	69.22	75.07	69.96	75.31	70.6	77.00
Azerbaijan	66.6	74.20	68.1	75.10	70.9	76.10
Belarus	66.73	76.34	62.18	73.92	64.67	76.36
Bosnia and Herzegovina	69.2	74.50	72.46	80.27	72.88	78.08
Bulgaria	68.29	74.90	68.19	75.09	70.12	77.26
Croatia	68.64	75.85	69.11	76.88	72.51	79.73
Czech Republic	68.12	75.43	71.33	78.08	74.16	80.29
Estonia	65.70	74.90	64.76	75.99	69.75	80.02
Georgia	68.22	75.80	67.50	75.10	69.20	77.70
Hungary	65.23	73.72	66.70	75.54	70.21	78.23
Kazakhstan	63.93	73.27	60.76	71.40	63.68	73.62
Kyrgyzstan	64.33	72.48	64.47	72.18	64.80	73.00
Latvia	65.33	75.09	64.18	74.95	67.48	77.55
Lithuania	66.84	76.22	66.33	76.95	67.11	78.53
Macedonia	70.17	74.14	70.46	75.31	72.13	76.68
Moldova	65.59	72.32	63.79	71.40	65.30	73.60
Montenegro					72.83	78.17
Poland	66.72	75.43	68.68	77.46	71.48	79.92
Romania	66.63	72.66	67.14	74.17	69.77	77.29
Russia	64.20	74.50	59.86	72.42	62.73	74.70
Serbia					71.35	76.64
Serbia and Montenegro	68.70	73.80	70.14	74.99		
Slovakia	66.80	75.29	68.87	77.13	71.36	78.95

Slovenia	69.24	77.24	71.74	79.28	75.77	82.30
Tajikistan	66.97	71.86	66.30	70.90	70.50	75.30
Turkmenistan	61.85	68.37	59.72	67.89	60.61	68.94
Ukraine	66.16	72.25	67.23	72.50	64.35	74.84
Uzbekistan	66.13	75.19	62.62	73.61	64.37	70.93

Table A3.

Competition and changes in life expectancy in the transformation period

Country	Economic competition, 2011	Political competition, 2011	Life expectancy (male), 2011	Difference in life expectancy (between 2011 and 1989)
Kazakhstan	2	4	60.9	-3.0
Belarus	2	3	64.7	-2.0
Kyrgyzstan	2	17	63.4	-1.0
Turkmenistan	1	1	61.3	-0.5
Russia	2.7	14	64.0	-0.2
Uzbekistan	1.7	1	66.0	-0.1
Lithuania	3.7	20	68.0	1.2
Moldova	2.3	18	66.9	1.3
Armenia	2.3	15	70.7	1.5
Ukraine	2.3	16	64.9	1.7
Georgia	2	16	70.2	2.0
Bulgaria	3	19	70.7	2.4
Macedonia	2.7	19	73.1	2.9
Latvia	3.7	18	68.5	3.2
Serbia*	2.3	18	72.0	3.3
Tajikistan	1.7	7	70.9	3.9
Romania	3.3	19	71.1	4.5
Albania	2.3	19	73.7	4.6
Azerbaijan	1.7	3	71.2	4.6
Montenegro*	2	19	73.4	4.7
Croatia	3	19	73.8	5.2
Estonia	3.7	19	71.1	5.4
Slovakia	3.7	20	72.3	5.5
Poland	3.7	20	72.6	5.9
Hungary	3.7	20	71.2	6.0
Czech Republic	3.7	18	74.7	6.6
Slovenia	3	20	76.8	7.6

* For 1989 data on life expectancy at birth are for Serbia and Montenegro.

Table A4.

Competition policy score

	1992	1999	2008
Albania	1	1.7	2
Armenia	1	1	2.3
Azerbaijan	1	2	2
Belarus	1	2	2
Bosnia and Herzegovina	1	1	2
Bulgaria	2	2.3	3
Croatia	1	2.3	2.7
Czech Republic	2	2.7	3
Estonia	1	2.7	3.7
Georgia	1	2	2
Hungary	2	3	3.3
Kazakhstan	1	2	2
Kyrgyzstan	1	2	2
Latvia	2	2.3	3

Lithuania	1	2.3	3.3
Macedonia	1	1	2.3
Moldova	1.7	2	2.3
Montenegro	1	1	1.7
Poland	2	2.7	3.3
Romania	1	2.3	2.7
Russia	2	2.3	2.3
Serbia	1	1	2
Slovakia	2	3	3.5
Slovenia	1	2.3	2.7
Tajikistan	1	2	1.7
Turkmenistan	1	1	1
Ukraine	2	2.3	2.3
Uzbekistan	1	2	1.7

*EBRD Transition Indicators, 2013

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