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INSTITUTION BUILDING AND GROWTH IN TRANSITION ECONOMIES

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INSTITUTIONS AND ECONOMIC PERFORMANCE (FORMERLY TRANSITION ECONOMICS)

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INSTITUTION BUILDING AND GROWTH IN TRANSITION ECONOMIES

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ABSTRACT

Institution Building and Growth in Transition Economies*

Drawing on the recent literature on economic institutions and the origins of economic development, we offer a political economy explanation of why institution building has varied so much across transition economies. We identify dependence on natural resources and the historical experience of these countries during socialism as major determinants of institution building during transition. Using natural resource reliance and the years under socialism to extract the exogenous component of institution building, we also show the importance of institutions in explaining the variation in economic development and growth across transition economies during the first decade of transition.

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I. Introduction

The transition process has opened a wide wedge in economic development among the transition economies of Central and Eastern Europe and Central Asia. While in 1992, GDP per capita in constant 2000 US dollars varied between 300 and 7,000 for the countries in this region, it varied between 200 and 11,000 in the year 2004. During the same period, GDP per capita increased by 64 percent in Poland and shrank by 26 percent in neighboring Ukraine. While all transition economies faced the difficult task of building new market-compatible institutions, the process and success of reform has varied greatly across countries. Generally, the Central and Eastern European countries proved to be more successful reformers and today score better in terms of institutional and economic development than the countries of the former Soviet Union, including the Baltic States. Why have some transition economies fared so much better than others? Why have some transition economies succeeded in building a new institutional framework after the fall of socialism, while others have not?

This paper proposes and tests a hypothesis based on political economy of why institution building has varied so much across countries in this part of the world and shows the importance of institution building in explaining the variation in economic performance across transition economies. The literature examining the growth experience of transition economies over the last decade has focused mostly on reform strategies – shock versus gradualism –, macroeconomic policies and initial conditions to explain the dramatic variation in growth across transition economies (for an overview, see Svejnar 2002). However, as noted by Campos and Coricelli (2002) in their review of the literature on growth in transition economies, "the role of institutions has largely been neglected in empirical analysis of [economic] growth in transition economies." This is in contrast to an extensive cross-country growth literature that has discussed the importance of institutions.

The experience of transition economies offers a unique historic experiment in institution building. The transition started with the rapid destruction of the institutions supporting socialism in all transition economies. The building of new institutions supporting a broad-based market economy, however, has been much slower and has varied significantly across transition economies.[1]

This paper offers a political economy explanation of why institution building has varied so much across transition countries, building on North's hypothesis that "institutions are not usually created to be socially efficient, [but] are created to serve the interests of those with bargaining power to create new rules" (North, 1990, p. 16). The socialist elite remained a powerful political interest group during the initial phase of the transition process in most transition countries, but its authority varied across countries depending on their entrenchment in power. We conjecture that the incumbent socialist elite or nomenclatura had fewer incentives to create institutions that fostered competition, as this would reduce their economic power. Further, economies that rely more on natural resources offer larger opportunities for the elite (being the old nomenclatura or a newly emerged group of business owners that benefited from privatization and is well-connected to the established elite) to extract rents and as such the politically powerful in these countries have less incentive to establish strong property rights. Political entrenchment and reliance on natural resources critically determined whether the behavior of the ruling elite and thus the transition process was "catalytic" or "extractive". We use the number of years a country has been socialist as proxy for the entrenchment of the socialist elite and thus their power to influence the transition process, and the share of natural resource exports in GDP at the beginning of the transition process as an indicator of the dominance of natural resources in the

[1] While most transition economies initiated economic reforms to liberalize their economies, only a few countries, including Estonia, Hungary and Poland, were able to build institutions to enforce the protection of property rights and implement an enabling business environment to encourage investments (World Bank 2002, and Berglof and

economy and as a proxy for the elite's opportunities to extract rents. We show that countries that had been longer under socialist government and rely more on natural resources experienced less institution building over the first decade of transition. This finding is robust to using different indicators of institution building and controlling for other factors that might be associated with institution building.

We also assess the relationship between institutional and economic development. To control for simultaneity bias and reverse causation, we use the component of institutional development that can be explained by natural resource reliance and socialist entrenchment, and relate it to GDP per capita growth rates over the period 1992 through 2004. We test the robustness of our results by using an alternative proxy for economic development, growth in household consumption. Our results indicate a strong and robust relationship between the exogenous component of institutional development and economic growth. This relationship is robust to using different indicators of institution building and to controlling for other factors associated with cross-country variation in GDP per capita growth, including initial conditions, macroeconomic policies and reform strategies.

This paper is related to two strands of literature. First, it is related to the vast literature on the economics of transition, and on the growth experiences of transition economies in particular. We only mention a select number of papers in this area and refer to Campos and Coricelli (2002) for a more detailed review. This literature has focused mostly on the relative importance of reform strategies (including liberalization policies), macroeconomic policies, and initial conditions in explaining output performance. De Melo et al. (1996), Fischer et al. (1996) and Selowsky and Martin (1997) find a positive relationship between progress in liberalizing prices, trade, capital account and ownership and output growth. Macroeconomic policies, in particular

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Bolton 2002). On the other extreme, Tajikistan has emerged as one of the least reformed (World Bank 2002) and its GDP per capita in 2004 was lower than at the start of the transition period.

the effectiveness of the government in controlling inflation, have also been shown to be associated with economic performance during the transition (Fischer et al. 1996). Initial conditions, such as the distance to Western Europe, have also been found to be important factors in explaining variation in growth paths of transition economies (De Melo et al. 2001, and Falcetti et al. 2002).[2]

Our work is also linked to the literature on institutional development and economic growth. North and Thomas (1973), Jones (1981) and North (1981) discuss the importance of good institutions for economic development.[3] Easterly and Levine (2003) and Rodrik et al. (2004) show that institutions are more robustly associated with faster economic growth than policies. Our paper is closely related to a series of papers by Acemoglu, Johnson and Robinson (2001, 2002, 2003; henceforth AJR) and their methodology as described in AJR (2004). First, we also focus on the importance of institutions for economic development, but we do this for a group of countries – the transition economies – for which an exogenous shock, namely the collapse of socialism, provides a natural and meaningful testing ground of the impact of institution building on growth. Second, we also consider that economic institutions are endogenous, and that institutional change depends on the economic interests of those groups with political power. Third, we take from their work the notion that the degree of power of the ruling groups depends on their internal consistency and the resources on which their power is based.

While these two literatures have largely developed on their own, in recent years the transition literature has begun to consider the importance of institutions for economic development. One of the first authors on the topic was Murrell (1992, 1995), who argued that differences in post-transition performance across countries might be best explained by the

[2] However, not all results are robust to controlling for additional variables and changes in the time period studied. Aslund et al. (1996) find no robust effect of measures of reform and macroeconomic policies on output change during the period 1989 to 1995, suggesting other factors may have been important.

effectiveness of newly created institutions. Since then, several others have argued that institutions may exert a profound influence on economic development in transition countries (e.g., Dewatripont and Roland 1997, McMillan 1997, and Hoff and Stiglitz 2004; see Djankov et al. 2003 and Murrell 2003 for reviews). However, empirical evidence remains sparse, mainly because thus far the time interval available for empirical analysis has been too short to conduct a robust analysis. Exceptions are Grogan and Moers (2001) and Havrylyshyn and Van Rooden (2003) who both use broad measures of institutional development to study the link between institutions and growth.[4] Their results provide evidence for a positive relationship between institutions and growth. However, neither study offers a conceptual framework for the importance of institutions in explaining variations in growth or fully explores the endogeneity between economic performance and institutional development.[5] Thus, while both studies provide valuable initial attempts to assess the empirical relationship between institutions and economic growth, these analyses do not offer robust and conclusive evidence of this relationship.

Now that we have more than a decade of growth experience, empirical analysis of the relationship between institution building, its determinants and growth in transition economies has become feasible and desirable. To our knowledge, this is the first paper that (i) presents a conceptual framework of institutional development in transition countries based on predetermined factors and tests this framework using data on endowments and outcome measures of institutional development, and (ii) investigates the relationship between the exogenous component of institutional development and economic growth for a large number of transition economies.

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[3] Knack and Keefer (1995), Mauro (1995), Hall and Jones (1999), Rodrik (1999), and Engerman and Sokoloff (2000) show that this relationship is robust to controlling for reverse causation and simultaneity bias.

[4] At a micro-level, McMillan and Woodruff (2002) present evidence for three transition countries of a positive link between property rights, entrepreneurship, and firm performance. Their results can be interpreted as evidence in support of a positive relationship between institutions that support contracting and economic growth.

We would like to point to several limitations of our analysis. First, we assess the determinants and consequences of institution building broadly defined. While we also consider indices that capture specific dimensions such as rule of law or control of corruption, we do not explore specific institutional arrangements. Second, while our analysis controls for reverse causation and simultaneity bias, the specification tests on the appropriateness of instruments are weak, so that we are cautious in our interpretation. Third, we focus on institutions while controlling for the impact of policies. We do not disentangle institutions and policies because the difference between the two is hard to define.

The remainder of the paper is organized as follows. Section 2 presents a framework of institution building across transition economies and provides empirical evidence. Section 3 presents evidence on the relationship between institutional and economic development and section 4 concludes.

II. Institution Building in Transition Economies

This section develops a conceptual framework to explain the wide variation in institution building that can be observed across transition economies. We then show that reliance on natural resources and entrenchment of the socialist elite can explain institution building.

1. Institution Building in Transition Economies: A Conceptual Framework

Institutions – both formal and informal – are the underlying rules that govern transactions between agents in an economy, both transactions between private parties, as well as between private parties and the government. Property rights and contract enforcement are two crucial elements of the institutional framework. By allowing for the creation, registration and

[5] Only the first paper considers the possibility of endogeneity between growth and institutions but uses only one instrument: ethnolinguistic fractionalization.

enforcement of private property rights vis-à-vis other private parties and the government, the institutional framework gives incentives for investment in tangible and intangible assets and risk-taking (Claessens and Laeven 2003, Johnson et al. 2002). By allowing for the efficient enforcement of contracts, the institutional framework encourages market-based commercial and financial transactions. While the socialist economies had a well-defined institutional framework, these institutions did not allow for effective private property and for market-based exchange. As the transition countries embarked on the transformation of their economies to market economies, they thus faced the task of building new institutions.

Our explanation of institutional development is based on the behavior and the incentives of the elite during the transition period. In some countries, the elite actively fostered a transition to a market economy with a broad base of participants in the economic and political life through the provision of basic property rights and rule of law. In other countries, the elite was mostly concerned with securing for themselves property rights in the formerly state-owned enterprises to extract economic rents and thus securing economic and political power in the post-transition society. We refer to these two opposite transition experiences as "catalytic transition" and "extractive transition".[6]

We conjecture that the behavior of the elite during transition was largely determined by two main country characteristics: the endowment with natural resources and the entrenchment of the ruling elite during the socialist period. The "natural resource" argument is well defined in the literature and often referred to as the curse of natural resources (Sachs and Warner 2001). Given the surplus character of natural resources, we expect the elite at the beginning of the transition period to be most interested in securing the property rights over these resources that gave them a

[6] Governments in the first group of countries will interact with entrepreneurs according to what Frye and Shleifer (1997) have called the "invisible hand" model, according to which "the government … restricts itself to providing basic goods, such as contract enforcement, law and order." Governments in the second group follow the "grabbing

power base. It is generally easier to materialize short-term profits from natural resources such as oil than from fixed assets such as manufacturing plants, equipment and machinery, because proceeds from natural resources depend less on the creation of a market, on human capital, and on R&D investments. Moreover, at the beginning of the transition, most manufacturing plants in transition countries had assets that were outdated and produced goods that were well below Western standards, and an upgrade of these facilities required substantial investments that few were willing to bite into given the absence of secure property rights and the cost of financial capital.[7] Elites in extractive transition countries were therefore less interested in establishing general property rights for the public at large and, in general, in establishing an institutional framework for a market economy with broad-based participation.

The second channel of institution building we consider relates to the entrenchment of the ruling elite during the socialist period. We conjecture that the degree of political entrenchment is largely determined by the country's time under socialism. One of the consequences of an extended time under socialism and the consequent centralization of power was the absence of any political opposition, or even civil society institutions and social networks, such as churches, political clubs, and trade unions to challenge the power of the political incumbents (as in Becker 1983). These entrenched political elites are less inclined to share economic and political power during the transition process because they can use their political power to extract rents. In addition, outside opportunities for these bureaucrats are generally limited. In countries where communists were in power for a shorter period of time civil society groups may have been better able to retain ground. As a result, in these countries a new political elite is more likely to emerge during the transition period and take over from the ruling elite under socialism. Our theory

hand" model, according to which "the government consists of … bureaucrats pursuing their own agendas, including taking bribes" (Frye and Shleifer 1997).

[7] We do not imply that there was no rent-seeking and asset grabbing in manufacturing and other sectors. Our argument is that natural resources are *relatively more* prone to rent-seeking and asset grabbing.

predicts that political elites in the original countries of the Former Soviet Union (FSU) with a long period of communist rule continued to exercise substantial power during the transition period and as a result these countries were less willing to engage in market reforms and establish general property rights. In Central Europe, the Baltic States and Moldova, with less time under socialism, the old elites had fewer possibilities to clinch to power.

Belarus and the Ukraine, the two countries in our sample together with Russia that have been longest under communism, illustrate our point.[8] Upon gaining independence, the communists remained in power in both countries. The Soviet economic and social structure had provided a social safety net, and the need for economic reforms was not apparent (World Bank 2002). Because of its strong historical link to Russia, Belarus remained a close ally of Russia and institutional development has been one of the lowest among all transition economies. Ukraine also made little progress in structural reform during the initial transition years and the business environment is still plagued by government interventions, weak property rights, onerous taxes, and corruption. Not surprisingly, Ukraine's economic growth performance over the period 1992-2004 has been the worst of all transition economies except for Moldova and Tajikistan.

We posit that resource endowments and entrenchment of the socialist elite together influenced institution building during the beginning of transition. Elites that were less entrenched had less possibilities and elites in economies less dependent on natural resources had less incentives to clinch to power and were thus more likely to allow the emergence of public property rights and rule of law (see Sonin 2003 and Hoff and Stiglitz 2004 for formalized models).[9] Our premise that the effects of natural resource endowments and entrenchment on

[8] Ukraine's link to Russia predates the establishment of the USSR. From 1654, most of the territory of today's Ukraine fell under the protectorate of Russia.

[9] Similar theories have also proven effective in explaining the presence or absence of such phenomena as corruption (Shleifer and Vishny 1993), large unofficial economies (Johnson et al. 1997), asset stripping and tunneling (Johnson et al. 2000 and Friedman et al. 2003), related lending (Laeven 2001), and state capture more generally (Hellman et al. 2003).

institutional development are complimentary is confirmed by the data. While there is little variation in the degree of political entrenchment across former FSU countries, there is a large variation in natural resource endowments within FSU countries. Hence, even among FSU countries there is a wide range of variation in the behavior of the elite and the degree of institution building during the transition period. While both the presence of significant resource endowments and an entrenched elite turned out to be detrimental to the emergence of secure property rights and rule of law, the effect was reinforced by the presence of both.

A case in point is Armenia, a landlocked country with few natural resources that gained independence from the Soviet Union in 1991 while having a conflict with neighboring Azerbaijan over the territory Nagorno Karabakh. Despite a long socialist tradition as a member of the FSU, the war with Azerbaijan led to a strong nationalist movement under the leadership of Levon Petrosian, who gained power in the first parliamentary elections. Under his government, Armenia initiated important reforms, such as land and housing reforms, a first step to the establishment of property rights. Reforms were accompanied by improvements in the rule of law and control of corruption. Compared to its neighboring countries, Armenia's has shown strong institution building and economic performance. In fact, Armenia's GDP per capita growth over the period 1992 to 2004 has been one of the highest among all transition economies in our sample. While the war with Azerbaijan may have played an important role in shifting the balance of political power from the communists to the nationalists, it seems unlikely that this alone can explain subsequent reform and economic performance. Azerbaijan was involved in the same war, but the communists retained power and economic growth during the transition period was substantially lower than the average across transition economies.[10] A key difference between the two countries is the endowments of natural resources, Armenia having relatively few natural

[10] While economic growth in Azerbaijan started to pick up in 1996, growth occurred mainly in oil-related activities that were controlled by the state and the political elite (World Bank 2002).

resources and Azerbaijan having substantial oil reserves and rich mineral deposits. Our hypothesis is that the level of natural resources are a key factor in explaining why the nationalists of Armenia did initiate market-based reforms, while the communists of Azerbaijan have shown little interest in moving to a market economy.

Another example is Albania, by far the poorest country of Central and Eastern Europe before the onset of the transition period, and a country with little natural resources. When the communist regime fell in 1990, Albania was a failed state on the verge of a complete breakdown in civil order. The first "free" elections were held in 1991 and won by the ex-Communist Party, but economic decline led to strikes and a call for new elections in 1992 that were won by the Democratic Party, ending 47 years of communist rule. Because of a lack of natural resources, the benefits and rents associated with political power were much smaller in Albania than in countries with an abundance of natural resources. This meant a strong support for a democratic government and institutional reform. Despite its dismal initial conditions, Albania became one of the star performers in terms of macroeconomic performance, with a GDP per capita growth over the period 1992 to 2004 of more than 6 percent per year, the highest in our sample.

2. Measuring Institutional Development

We focus on a broad indicator of institutional development, as computed by Kaufman, Kraay and Mastruzzi (2004, henceforth KKM). Drawing on 25 different data sources constructed by 18 different institutions, KKM estimate six different dimensions of institutional development: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption and political stability.[11] Each of the six measures is a principal component indicator

[11] These sources include, among others, the Business Environment Risk Intelligence (BERI), Freedom House, Gallup International, the World Economic Forum, the Heritage Foundation, and the International Country Risk Guide (ICRG) compiled by the Political Risk Services group. These institutions collect and construct similar variables of institutional quality, such as corruption, that have been widely used in the literature. KKM apply

with a mean of zero and a standard deviation of one, estimated with an unobserved component model to control for missing observations across the different variables. While KKM present estimates of these six indicators for 1996 to 2004, we will focus on the indicators for 1996, the earliest available time period.[12]

Our main variable Institutional Development is the average of these six variables and varies between –1.68 in Tajikistan and 0.78 in the Czech Republic. Table 1 presents Institutional Development across the 24 countries of our sample.[13] Definitions and data sources of the variables used in this paper can be found in the Appendix. The overall mean of Institutional Development, –0.20, is below the mean for a world-wide sample (which is zero), while the standard deviation 0.62 is below the standard deviation for the world-wide sample (0.95), suggesting that there is less variation in institutional development across transition economies than across a broader sample of developed, developing and transition economies. The standard deviation of Institutional Development between 1996 and 2004 increases from 0.62 to 0.89, suggesting that the institutional gap has widened further across the transition economies.

Our analysis might seem restricted by using institutional development in 1996 rather than at the beginning of the sample period for the growth regressions. However, we see the use of institutional development in 1996 rather than in 1992 not necessarily as a shortcoming. As discussed above, the transition economies experienced a period of rapid institutional change – first institutional destruction and then a varying process of institutional creation. Our measure of institutions in 1996 thus captures institution building over the first years of transition. Further, in robustness tests, we compute a measure of institutional change by considering the difference

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principal components techniques to this set of variables from various sources to construct broad measures of institutional development along six dimensions. By using the KKM measures as broad indicators of institutional development we avoid having to choose among these different but closely related variables (the correlation between these variables is generally high). Each of the KKM components is highly correlated with most of the underlying measures. For example, the index of corruption is highly correlated with the ICRG index of corruption.

between ICRG measures of Rule of Law and Corruption at the beginning of the transition period and the corresponding component of Institutional Development in 1996. The shortcoming of this measure is that we have to take the initial value for the Soviet Union for all FSU countries and the initial value for Yugoslavia for all the Former Yugoslav republics in our sample. [14]

Critics have pointed to the fact that proxies of institutional development are outcome-oriented rather than measuring inputs (Glaeser et al., 2004). In robustness tests, we therefore also use the EBRD reform index as a measure of legislative and regulatory inputs into institutional development. The EBRD index measures reforms in the areas of enterprise reform, competition policy, banking sector reform, and reform of non-banking financial institutions.[15] Further, recognizing the bi-directional causality from institutional to economic development, we extract the exogenous component of institutional development and relate it to economic development. A positive relationship between institutional and economic development, however, does not suggest that there is no reverse causation from economic to institutional development; rather it suggests that our findings are not due to this reverse causation.

3. Proxies for Endowments and Socialist Entrenchment

We use the share of fuel, ores, and metal exports relative to GDP, as measured in the first available year of the sample period, as proxy for the importance of natural resources in an economy. Table 1 shows quite a variation across transition economies, ranging from less than a percent in Latvia and Albania to 55% in Tajikistan. A simple bivariate regression shows that raw exports explain 48% of cross-country variation in Institutional Development. In robustness tests,

[12] The EBRD reform index is available before 1996 but this is a measure of legislative and regulatory reforms, not a broad measure of institutions.
[13] We only include the transition economies of Europe and Central Asia.
[14] ICRG data are not available for all countries in our sample for 1996 so that we still have to rely on KKM for the end-point of this variable of institution building.
[15] Table 2 shows a high correlation between all four indicators of institution building.

we use gas reserves per capita in 1990 as indicator of endowments with natural resources. While Initial Raw Exports and gas reserves per capita are positively and significantly correlated with each, the correlation is far from perfect (Table 2). While Initial Raw Exports is a more comprehensive measure of natural resources, gas reserves per capita could be considered more exogenous as it refers to exploitable resources rather than actual exploitation. We do not find a significant correlation between natural resource reliance and the rate of depreciation or measures of enrollment, two other channels through which natural resource endowments are conjectured to impact economic development (Sachs and Warner 2001).

To capture the historic experience of transition economies during the socialist period and thus the entrenchment of the socialist elite at the start of the transition period, we use Years under Socialism, the number of years a country has spent under Socialism. This variable varies from 40 years for Hungary, one of the last countries to become socialist after World War II and one of the first countries to start the transition process in 1989, to 74 years for Russia, Belarus and Ukraine, the core countries of the Former Soviet Union. Variation in Years under Socialism explains 58% of variation in Institutional Development. As alternative indicator of entrenchment we use Executive Constraints 1930, which measures on a scale from one to seven the de facto political independence of a country's chief executive. We use this indicator to measure the historical memory of interest groups, political debate and competition, which should impact the degree to which the socialist elites were able to maintain a grip on power during the transition process. Unlike Years under Socialism, this variable provides quite some variation for non-FSU transition economies, ranging from one in Albania to seven in the case of the Czech and Slovak Republics. Years under Socialism and Executive Constraints in 1930 are positively and significantly (10% level) correlated with each other.

While the Reliance on Natural Resources and Years under Socialism variables are significantly and positively correlated with each other (correlation coefficient of 42%, significant at the 5% level), this is by far a perfect correlation. On the one hand, we have countries like Hungary, Czech Republic and Slovenia that have few natural resources and have spent little time under socialism. Not surprisingly, these three countries have quickly developed market-based institutions, judging by our indicator. On the other hand, Azerbaijan, Tajikistan and Turkmenistan have both high levels of natural resources and highly entrenched socialist elites. These three countries have among the lowest value for our indicator of institutional development. However, we have also countries that score differently on our two conjectured determinants of institution building. Belarus and Ukraine have few natural resources, but very entrenched socialist elites, while Bulgaria and Macedonia have substantial natural resources, and a socialist elite that was not as entrenched. Belarus, Ukraine and Macedonia have values of institutional development below the sample average and median, and Bulgaria ranks eleventh in our measure of institutional development, slightly above the sample average.

4. Natural Resources, Socialist Entrenchment and Institutional Development

The results in Table 3 provide statistical evidence that natural resource reliance and time spent under socialism critically influenced institution building over the first years of transition. Both Years under Socialism and Initial Raw Exports enter negatively and significantly at the 1% level in the regression of Institutional Development indicating that countries with a longer socialist heritage and more reliant on natural resources had higher levels of institutional development in 1996. Together, these two variables explain 76% of variation in institutional development across transition economies (column 1).

Using alternative indicators of institution building confirms our finding. In columns 2 and 3, we use the change in institutional development as dependent variables. Specifically, we compute the difference between the Rule of Law and Control of Corruption indicators constructed by KKM for 1996 and the respective ICRG indicators for the first year of transition. Using these indicators of institutional change confirms our findings. Years under Socialism enters negatively and significantly at the 1% level in both regressions. Initial Raw Exports enters negatively and significantly at the 5% in column 2 and at the 10% level in column 3. Finally, in column 4, we use the institutional reform indicator, constructed by EBRD for 1996. Using the institutional reform rather than the institutional development indicator confirms our results.

Using alternative proxies for socialist entrenchment and natural resource reliance confirms our findings. Gas reserves per capita, our alternative indicator of endowments enters at the 1% level, while Years under Socialism continues to enter at the 1% level (column 5). Similarly, using Executive Constraints in 1930 as alternative indicator of entrenchment and historical memory does not change our results (column 6). Finally, column 7 shows initial raw exports in GDP can explain cross-country variation in institutional development across the 14 FSU countries in our sample, all of which have been under socialism for more than 50 years. Our results are thus not only driven by the difference in Years under Socialism, but also by different endowments with raw materials.

The empirical relationship between socialist entrenchment, natural resources and institution building is robust to controlling for other country traits that might be associated with faster institutional development. Table 4 presents regressions where we include control variables, one at a time, in the baseline regression of Institutional Development on Years under Socialism and Initial Raw Exports. There is no evidence that FSU countries, i.e. countries dominated by Russia for at least 50 years, or countries with closer economic links to other transition

economies, as measured by the Trade Share with CMEA partners relative to GDP in 1990, experienced slower institution building once we control for the time spent under socialism (columns 1 and 2).[16] Controlling for strong links to the political and economic past, however, does not alter the results. Being closer to Western Europe did not speed up institution building, while future EU members did develop market-based institutions at a faster rate (columns 3 and 4). [17] Distance from Vienna does not enter significantly, while a dummy variable for countries that entered the EU in 2003 enters positively and significantly at the 1% level. The positive coefficient can be explained with the prospect of future EU membership fostering institution building, both through political incentives and through assistance from the original EU member states (Roland and Verdier 2003). Controlling for EU Accession, however, does not affect our finding of a negative relationship between socialist entrenchment, natural resources and institution building. Ethnic fractionalization or being landlocked does not seem to have an impact on institution building (columns 5 and 6). Easterly and Levine (1997) show that ethnic fractionalization fosters rent-seeking and might not be conducive to the building of strong market institutions. Bloom and Sachs (1998) show that landlocked economies experience lower growth rates. Our results do not provide evidence for either hypothesis. Countries that have a longer tradition of state-level institutions did not experience faster institution building in the early years of the transition process (column 7). Bockstette, Chanda and Putterman (2002) compute an index of state antiquity, a measure of experience with state-level government, and show that countries with a longer tradition of state-level government have higher levels of political stability, institutional development and income per capita. For our sample of transition economies, however, this relationship does not hold and the negative association of socialist entrenchment

[16] While we focus on a dummy that excludes Russia, including Russia in the FSU dummy produces the same results.
[17] Ten countries joined the EU in 2003: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic, and Slovenia. Except for Cyprus and Malta, these are all transition economies. All eight transition economies that joined the EU in 2003 are included in our analysis.

and natural resource reliance with institutional development is not affected. Countries that suffered a civil war during the sample period, on the other hand, experience slower institution building (column 8). In column 9 we control for the level of education using data on enrollment into tertiary schools from the World Development Indicators. Again, the results are not altered and higher university enrolment is not associated with faster institution building.[18] Repressed inflation during the pre-transition era also does not alter the results (column 10). We control for price distortions by using the increase in deflated wages minus the change in real GDP over the period 1987 to 1990 (De Melo et al. 1996). However, initial price distortions are not significantly associated with institution building and controlling for them does not affect our results. Controlling for the initial state of price and trade liberalization and importance of the private sector as well as the speed with which reforms in these areas were implemented does not affect our findings (column 11). To assess the sensitivity of our results to controlling for macroeconomic reforms we use indicators developed by de Melo et al. (2001) for price, trade and ownership liberalization, with annual variables for the period 1990-97. We use the values for 1990 to proxy for the initial condition of price, trade and ownership liberalization in transition economies and calculate a principal component indicator of these three indices. Similarly, we use a principal component indicator of changes in price, trade and ownership liberalization, thus controlling for the speed of liberalization. Both variables enter significantly and positively, suggesting that transition economies that started the transition process earlier and implemented reforms faster also experienced faster institution building. Finally, the privatization technique does not seem to matter (column 12). Countries broadly opted for one of two privatization methods: direct sales and equity offerings, or mass privatization (also known as voucher privatization) (Bolton and Roland 1992).[19] Rather than being sold to strong outside

[18] Using average years of schooling as indicator of human capital accumulation does not change our findings.
[19] Several countries also used the method of management-employee buyouts to privatize enterprises.

investors, most shares from the voucher privatization have ended up in the hands of the managers and their friends, who had little incentive to engage in corporate restructuring (Boycko et al. 1994).[20] However, we cannot find an independent effect of the privatization technique on institutional development.

Overall, the results in Tables 3 and 4 support our hypothesis of institution building in transition economies. Countries whose economies are more based on natural resources and whose socialist governments were more entrenched have experienced slower institution building. This is consistent with our hypothesis that the elites in these countries were less willing to give up economic and political power and therefore were more interested in preventing the build-up of market-compatible institutions that would threaten their hold on the economy.

III. Institutions and Growth in Transition Economies

This section tests the importance of institution building for economic growth across transition economies. Using our findings from the previous section, we relate the exogenous component of institution building, explained by natural resource endowment and socialist entrenchment, to measures of economic development.

1. Measures of Economic Development and Methodology

In line with the empirical growth literature, our main indicator of economic development is GDP per capita growth, averaged over the period 1992 to 2004. Growth in GDP per capita over the sample period varied between –5.1% in Tajikistan to 5.6% in Albania, with an average of 0.8% and a standard deviation of 2.8% (Table 1). As alternative indicator of economic development, we use the growth rate in final household consumption expenditure per capita in

[20] In some cases, privatization has increased the political power of managers, making it easier for them to extract rents from the state. A good example is Russia, where voucher privatization has led to a powerful group of oligarchs

constant local currency, averaged over the period 1992 to 2004. Household consumption might be a more direct measure of economic welfare than GDP, since it focuses on market-based consumption by the population. For our sample, household consumption per capita shows much greater variation over time than GDP per capita growth.

Throughout the regression analysis, we will use Two-Stage Least Square Regressions to empirically relate the exogenous component of Institutional Development to economic development. Specifically, we will regress Institutional Development on Years under Socialism, Initial Raw Exports and other exogenous variables in the first stage, and regress our respective indicator of economic development on the predicted value of Institutional Development and the other exogenous variables in the second stage. To test for the appropriateness of the econometric model, we report the Hansen test of overidentifying restrictions. Under the null hypothesis that the instruments are not correlated with the error terms, the test has a χ^2 distribution with (J-K) degrees of freedom, where J is the number of instruments and K the number of regressors. We also report the F-test that natural resource reliance and time under socialism do not explain Institutional Development in the first stage. While our focus is on the IV results, we also present the coefficient on Institutional Development from the corresponding OLS regression.

Given our relatively small sample of 24 countries, additional to Institutional Development, we include in our baseline regression only the log of initial GDP per capita in US dollars to control for convergence in GDP per capita across countries. When using growth in household consumption per capita as indicator of economic development, we include the log of initial household consumption per capita. In robustness tests, we will control for other variables that the literature has related to economic performance in cross-country growth regressions or specifically in the transition experience. We have already used some of these variables as

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that have the resources to obstruct institutional development (Barberis et al. 1996 and Frydman et al. 1996).

control variables in Table 4 and will discuss the other variables as we present the different robustness tests. Table 5 presents the correlation between GDP per capita, Institutional Development and the different control variables. We note that not only Institutional Development, but also, ethnic fractionalization and a dummy for the EU Accession countries are significantly (5% level) correlated with GDP per capita growth, while most reform indicators and policy variables are not significantly correlated with growth. Institutional Development is significantly correlated with the FSU dummy, the EU Accession dummy, the civil war dummy, distance from Vienna, initial liberalization and monetary growth. This underlines the importance of controlling for these variables when assessing the robustness of the relationship between institution building and GDP per capita growth.

2. Institutions and Growth: Results

The results in Table 6 suggest a strong relationship between the exogenous component of institutional development and GDP per capita growth over the transition period until 2004. In both OLS and IV regression, Institutional Development enters significantly at the 5% level (column 1). The specification tests confirm the appropriateness of the instrumental variables. First, the F-test that Raw Exports and Years under Socialism are jointly insignificant in the first stage is rejected at the 1% level. Second, the test of overidentifying restrictions is not rejected in any of the regressions, suggesting that our instrumental variables do not impact GDP per capita growth beyond their impact through Institutional Development.

The relationship between the exogenous component of Institutional Development and GDP per capita growth is not only statistically but also economically significant. The coefficient size in column 1 indicates that a one standard deviation in Institutional Development (0.62) can explain a growth difference of 1.6 percentage points per year – almost 60% of a standard

deviation in GDP per capita growth, which adds up to a difference in GDP per capita after twelve years of 21 percent.

We are concerned that the results may be driven by outliers. As above, we follow Besley, Kuh, and Welsch (1980) to identify influential outliers. We identify Albania, Moldova, Tajikistan and Turkmenistan as influential outliers and re-run regression 1 without these four countries. Column 2 of Table 6 shows that Institutional Development still enters significantly at the 5% level and with an even higher coefficient.

The remaining columns in Table 6 show the robustness of our results to alternative indicators of institution building and economic development. Columns 3 and 4 show that our results are robust to using alternative indicators of institutional change, introduced in the previous section. Both Change in Rule of Law and Change in Control of Corruption, measured over the period 1990-96 enter positively and significantly at the 5% level. The EBRD indicator of institutional reforms, on the other hand, enters positively and significantly only at the 12% level (column 5). Our findings are also confirmed when using an alternative indicator of economic development. Institutional Development enters positively at the 1% level in the regression of household consumption per capita growth (column 6). Interestingly, the initial dependent variable, though always negative, only enters significantly in the regression of growth of household consumption per capita. We also note that the IV coefficients are in most cases larger than the OLS coefficients, consistent with Kraay and Kaufman (2002).

Table 7 shows the robustness of the growth-institution relationship to controlling for other growth determinants considered in the transition economics literature. In all cases, Institutional Development enters positively and significantly at least at the 10% level, unless otherwise noted. The first-stage F-test and the test of overidentifying restrictions confirm our model. In none of the regressions does the coefficient of Institutional Development fall

significantly, indicating that the measured exogenous component of Institutional Development does not proxy for any of these other factors.

We find that our measures of initial conditions do not explain growth variation across transition economies. Countries that as part of the Former Soviet Union were dominated by Russia may have started with different initial conditions, such as different industrial structures, and may find it more difficult to reorient their economies away from Moscow, hampering growth. Similarly, countries with greater trade links to other CMEA countries, as measured by the share of trade with Council of Mutual Economic Assistance (CMEA) partners in GDP in 1990, can be expected to have greater output slumps and slower recoveries as they adjust their industrial structure and re-orient their trade flows. Our results in columns 1 and 2, however, show no significant effect of being an FSU country or having stronger trade links with CMEA on GDP per capita growth, while the positive and significant impact of the exogenous component of Institutional Development is confirmed.[21]

Ethnic fractionalization may have a negative impact on institution building by fostering rent-seeking (Easterly and Levine 1997) and disagreement on reform priorities during transition, and thus leading to lower growth. We do not find that more ethnic fractionalization has a statistically significant impact on economic growth. However, the positive effect of institutional development on economic growth remains significant (column 3). Similarly, countries that are landlocked do not grow faster, while controlling for this geographic country trait does not affect our main finding (column 4).[22]

In column 5, we control for the fact that the EU Accession process might have fostered both institutional and economic development (for example, by increasing the inflow of foreign

[21] We also controlled for repressed inflation. While repressed inflation does not enter significantly, Institutional Development continues to enter positively and significantly

direct investment from EU countries) by including a dummy variable for the countries that entered the EU in 2003. While this dummy variable does not enter significantly, Institutional Development enters with a p-value of only 10.1% level. This reduced significance can be explained by the high correlation between both variables, which results in multicollinearity.[23] Closer geographic proximity to Western Europe, as measured by distance to Vienna, does not translate into higher growth and controlling for distance does not change our results (column 6).

Controlling for civil war episodes does not change our findings either. War and civil strife in Armenia, Azerbaijan, Tajikistan, Georgia, Moldova, Croatia and the FYR of Macedonia are likely to have had a negative short-term effect on economic growth and may have undermined political consensus on institution building. Surprisingly, the civil war dummy enters positively and significantly (column 7). Perhaps civil war redistributed power of political incumbents and offered a window of opportunity for institutional and economic reform. Also, growth has generally been found to accelerate after extended periods of civil war (Collier 1999). Our main finding of a positive and significant relationship between institutional and economic development, however, is not affected.

We find that differences in the level of education do not explain the different growth experience of transition economies. Glaeser et al. (2004) argue that human capital accumulation rather than institutions cause growth. Column 8 shows that the relationship between Institutional Development and economic growth is robust to controlling for a measure of human capital accumulation. Tertiary enrollment enters negatively, but insignificantly in the regression, while Institutional Development continues to enter positively and significantly.[24]

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[22] We also ran a regressions controlling for the size of the country with the log of total population. While population does not enter significantly, Institutional Development continues to enter positively and significantly in both OLS and IV regressions.

[23] In the OLS regression, neither of the two variables enters significantly.

[24] Our findings are confirmed when we use secondary school enrollment in 1992 or the average years of schooling in 1990 to measure educational attainment.

We find that macroeconomic policies and the speed of reform also do not explain the differences in GDP per capita growth across transition economies. In column 9, we control for the initial level of liberalization in 1990 and the speed of liberalization over the period 1990-97. Neither the initial level nor the changes in liberalization enter significantly in the regression, while Institutional Development continues to enter positively and significantly.[25] Thus, controlling for both the initial level of market-orientation and the subsequent speed of reforms does not change our findings of a robust relationship between institutional development and economic growth. Our Table 4 results, however, suggested that the speed of reform and degree to which these economies liberalized influenced institution building. In column 10, we therefore use the residual of a regression of Institutional Development on initial price, trade and ownership liberalization as well as the speed of reform in these areas. Together these variables explain 80% of the variation in Institutional Development. However, the component of Institutional Development not explained by the initial reform level and the speed of reform is still significantly and positively associated with economic growth over the first decade of transition.

Next, we control for specific policy areas. In column 11, we control for the privatization method. The negative coefficient on voucher privatization, significant at the 10% level, confirms the negative impact of mass voucher privatization on economic performance, while not affecting our main result: Institutional Development enters positively and significantly. Further, we control for government consumption, as measured by the share of government consumption in GDP, averaged over the sample period. While Government Consumption does not enter significantly, Institutional Development enters significantly (column 12). Finally, we control for the growth rate of reserve money as proxy for the monetary policy stance. While monetary

[25] The both reform indicators do not enter jointly significant either. We also tried the individual liberalization indicators and obtained the same results.

growth does not enter significantly, Institutional Development continues to enter positively and significantly (column 13).

3. Institutions and Growth: Comparing Pre- and Post-Transition

Countries that experienced faster institution building in the early years of transition, experienced not only faster GDP per capita growth post-transition, they also experienced relatively higher growth rates compared to the pre-transition period. Up to now, we have focused on growth and institution building after the beginning of the transition process. Alternatively, one can compare the growth experience before the beginning of transition with the growth experience post-transition and relate the difference to institutional change. How does the post-transition growth experience compare to the pre-transition growth experience? Do changes in growth experience pre- and post-transition vary systematically with the degree to which countries built new market-compatible institutions?

To assess the relationship between the growth difference pre- and post-transition and institution building, we rely on output data for the pre-transition period computed by de Broeck and Koen (2000) and Estrin and Urga (1997) and reported by Campos and Coricelli (2002). Specifically, we use output growth per capita for the period 1981 to 1990 and compare it to our data averaged over 1991 to 2004. Using output data before transition has to be done with even more caution than using GDP data from the early years of transition, as these were not market-based economies. There is no significant correlation between growth pre- and post-transition. Lithuania, Kyrgyz Republic and Belarus were the fastest growing countries before transition, while Slovenia and Croatia were the slowest growing economies with negative growth rates.[26] So, there was no reversal, convergence or perpetuation of pre-transition growth rates after

[26] We do not have data available for Albania and Macedonia for the pre-transition period.

transition started. Rather, the range and standard deviation of growth rates increased after transition started. While average growth of real GDP per capita over both periods was close to zero, GDP per capita growth varied between -5.5% and 3.4% over the post-transition, with a standard deviation of 2.4%, while average output per capita growth pre-transition varied between -1.6% and 2.9%, with a standard deviation of only 1.4%.[27]

Countries that developed market-compatible institutions at a faster pace experienced an acceleration of growth after transition compared to the pre-transition period, while countries that lagged in institution building experienced a reversal in their growth pattern compared to the pre-transition period. Institutional Development is positively and significantly (at the 5% level) correlated with the growth difference between these two periods with a correlation of 40%.[28] This confirms our earlier findings.

IV. Conclusions

Almost a decade and a half after the start of the transition period in Eastern Europe and Central Asia, we can observe a large variation in institutional and economic development across the different countries. Contrary to their FSU counterparts, the Central and Eastern European countries have generally experienced a rapid build-up of market-compatible institutions and economic transformation and development, although there are several exceptions in both groups. A large literature has attempted to explain the divergent growth experience on the basis of differences in economic policies, initial conditions, and reform strategies.

This paper assesses the importance of institutional development for economic growth across 24 transition economies. Unlike previous papers, we offer a theoretical framework of

[27] We use the average growth rate between 1991and 2004, since the data for the pre-transition period end in 1990. Using the 1992-2004 growth rates from Table 1 yields the same finding of a positive and significant correlation of Institutional Development and the growth difference.

institutional change and provide empirical evidence in support of this theory. Specifically, we conjecture that economies that are based on natural resources and had more entrenched socialist elites were less likely to experience the build-up of market-compatible institutions. We show that reliance on natural resources and the years under socialism explain variation in the speed of building up of market-compatible institutions. Our findings are robust to (i) controlling for other country traits that might explain cross-country variation in institution building and (ii) the use of different measures of institution building. Then, we relate the exogenous component of institutional development explained by natural resource dominance and socialist entrenchment to GDP per capita growth over the period 1992 to 2004, and find a strong and significant positive relationship. This finding is robust to (i) controlling for a large number of macroeconomic, initial and other country characteristics, (ii) using different measures of institutional and economic development, and (iii) controlling for outliers.

[28] If we consider the correlation between the component of Institutional Development explained by Years under Socialism and Initial Raw Exports, the correlation is again positive and significant at the 10% level.

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Table 1: Institutional and Economic Development across Transition Economies

Institutional Development is the average of six principal component indicators: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. Years under Socialism is the time (in years) under the socialist regime. Initial Raw Exports is the share of fuel, ores, and metal exports in GDP in the first available year of the sample period. GDP per capita growth is the average growth rate in real GDP per capita over the period 1992 to 2004. Detailed definitions and sources are presented in Appendix Table A1.

	Institutional Development	Years under Socialism	Initial Raw Exports	GDP per capita growth
Albania	-0.11	45	1.00	5.61
Armenia	-0.37	71	3.90	2.50
Azerbaijan	-0.87	71	13.33	-1.89
Belarus	-0.81	74	4.08	1.50
Bulgaria	-0.15	43	7.99	1.56
Croatia	-0.23	44	6.02	1.97
Czech Republic	0.78	42	3.85	2.13
Estonia	0.58	51	4.14	3.00
Georgia	-0.71	70	2.49	-2.20
Hungary	0.64	40	2.73	2.86
Kazakhstan	-0.59	71	12.59	1.89
Kyrgyz Republic	-0.30	71	5.83	-2.02
Latvia	0.20	51	0.51	2.11
Lithuania	0.23	51	5.47	0.59
Macedonia	-0.35	44	6.17	-0.64
Moldova	-0.22	51	1.26	-4.36
Poland	0.52	41	4.85	4.20
Romania	-0.14	42	2.84	1.78
Russia	-0.58	74	12.02	-0.53
Slovak Republic	0.28	42	11.60	2.69
Slovenia	0.70	44	3.00	3.09
Tajikistan	-1.68	71	55.18	-5.17
Turkmenistan	-1.22	71	31.76	1.43
Ukraine	-0.52	74	3.58	-2.49
Average	-0.21	56.2	8.25	0.82
Standard deviation	0.62	13.8	11.88	2.68

Table 2: Institution Building, Political Structure, Endowments and Entrenchment: Correlations

Institutional Development is the average of six principal component indicators: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. Change in Rule of Law (Corruption) is the difference in the principal component indicator of Rule of Law (Control of Corruption), computed by KKM and the respective ICRG measure for the first year of political transition, converted to a variable, with mean zero and standard deviation of one. The EBRD reform index is an average of reforms in the areas of enterprise reforms, competition policy, banking sector reform, and reform of non-banking financial institutions in 1996. Time under the socialist regime is measured by Years under Socialism. Initial Raw Exports is the share of fuel, ores, and metal exports in GDP measured in the first available year of the sample period. Gas reserves/population is natural gas reserves in trillion cubic meters in 1990 proved recoverable reserves divided by population. Executive constraints 1930 is the de facto political independence of the chief executive of a country in 1930, ranging from 1 (unlimited authority) to 7 (executive parity or subordination).

	Institutional Development	Change in Rule of Law	Change in Corruption	EBRD reform 1996	Initial Raw Exports	Gas reserves/ population	Years under Socialism
Change in Rule of Law	0.735***						
Change in Corruption	0.683***	0.891***					
EBRD reform 1996	0.900***	0.599***	0.548***				
Initial Raw Exports	-0.694****	-0.434**	-0.374*	-0.570***			
Gas reserves/population	-0.382*	-0.285	-0.300	-0.431**	0.438**		
Years under Socialism	-0.764***	-0.760***	-0.714***	-0.670***	0.416**	0.373*	
Executive Constraints 1930	0.513**	0.107	0.109	0.552***	-0.202	-0.151	-0.359*

Table 3: Socialist Entrenchment, Natural Resources and Institution Building

The regression equation is Institution Building = $\alpha + \beta_1$Initial Raw Exports + β_2 Years under Socialism + ε. Institution Building is Institutional Development, Change in Rule of Law, Change in Control of Corruption, or EBRD Reform. Institutional Development is the average of six principal component indicators: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. Change in Rule of Law (Corruption) is the difference in the principal component indicator of Rule of Law (Control of Corruption), computed by KKM and the respective ICRG measure for the first year of political transition, converted to a variable with mean zero and standard deviation of one. The EBRD reform index is an average of reforms in the areas of enterprise reforms, competition policy, banking sector reform, and reform of non-banking financial institutions in 1996. Initial Raw Exports is the share of fuel, ores, metal and agricultural raw exports in GDP measured in the first available year of the sample period (generally 1992, otherwise 1994). Time under the socialist regime is measured by Years under Socialism. Gas reserves/population is natural gas reserves in trillion cubic meters in 1990 proved recoverable reserves divided by population. Executive constraints 1930 is the de facto political independence of the chief executive of a country in 1930, ranging from 1 (unlimited authority) to 7 (executive parity or subordination). The regression in column (7) excludes all countries for which Years under Socialism is 51 or less. Detailed definitions and sources are presented in Appendix Table A1. All regressions are run with OLS with robust standard errors. P-values are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	Institutional Development	Change in Rule of Law	Change in Control of Corruption	EBRD Reform	Institutional Development	Institutional Development	Institutional Development
Years under Socialism	-0.026	-0.046	-0.035	-0.021	-0.032		
	(0.000)***	(0.000)***	(0.000)***	(0.003)***	(0.000)***		
Initial Raw Exports	-2.386	-1.095	-0.564	-1.616		-3.229	-2.990
	(0.000)***	(0.011)**	(0.085)*	(0.002)***		(0.000)***	(0.000)***
Gas reserves / population					-0.366		
					(0.004)***		
Executive Constraints						0.118	
1930						(0.006)***	
Observations	24	24	24	24	24	24	14
R-squared	0.755	0.595	0.517	0.551	0.612	0.626	0.579

Table 4: Socialist Entrenchment, Natural Resources and Institution Building – Robustness Tests

The regression is Institutional Development = $\alpha + \beta_1$Initial Raw Exports + β_2 Years under Socialism + $\beta_3 X + \varepsilon$. Institutional Development is the average of six principal component indicators: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. Initial Raw Exports is the share of fuel, ores, and metal exports in GDP measured in the first available year of the sample period (generally 1992). Time under the socialist regime is measured by Years under Socialism. X is an array of control variables: FSU is a dummy variable that takes on value one for countries of the Former Soviet Union other than Russia. Ethnic fractionalization is probability that two randomly selected individuals in a country are not from the same ethnic group. Landlocked is a dummy that takes on value one for countries that do not have direct access to the sea. CMEA Trade share is the share of trade with Council of Mutual Economic Assistance (CMEA) partners in GDP in 1990. EU Accession is a dummy variable that takes on value one for the countries that joined the EU in 2003. State antiquity is a measure of how long the country has been the site of a nation-state, kingdom or empire. Tertiary enrollment is the ratio of total enrollment in institutions of tertiary education, regardless of age, to the population of the age group that officially corresponds to this level of education. Civil war is a dummy variable that takes on value one for countries that have suffered a civil conflict over the period 1992-02. Distance from Vienna is measured in kilometers and refers to the capital of the respective country. Repressed inflation is the increase in deflated wages minus the change in real GDP over the period 1987 to 1990. Initial liberalization is a principal component indicator of three liberalization indexes (for price, trade, and ownership) in 1990. Speed of liberalization is a principal component indicator of the changes in the price, trade and ownership liberalization indexes over the period 1990-97. Voucher privatization is a dummy variable if the country opted for mass privatization (as compared to direct sales or equity offerings). Detailed definitions and sources are presented in Appendix Table A1. P-values are given in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Years under Socialism	-0.029	-0.029	-0.027	-0.013	-0.025	-0.026	-0.028	-0.025	-0.026	-0.022	-0.016	-0.032
	(0.001)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.007)***	(0.008)***	(0.000)***
Initial Raw Exports	-2.366	-2.361	-2.498	-2.220	-2.365	-2.383	-2.334	-2.193	-2.376	-2.404	-1.329	-1.974
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.006)***	(0.000)***
FSU	0.109											
	(0.601)											
CMEA Trade share		0.550										
		(0.462)										
Distance from Vienna			0.000									
			(0.615)									
EU Accession				0.667								
				(0.000)***								
Ethnic fractionalization					-0.238							
					(0.545)							
Landlocked						-0.003						
						(0.982)						
State antiquity							-0.528					
							(0.426)					

Civil war								-0.260				
								(0.022)**				
Tertiary enrolment									0.014			
									(0.935)			
Repressed inflation										-0.006		
										(0.487)		
Initial liberalization											0.450	
											(0.004)***	
Change in liberalization											0.392	
											(0.004)***	
Voucher privatization												0.183
												(0.266)
Observations	24	24	24	24	24	24	24	24	24	24	24	23
R-squared	0.759	0.761	0.756	0.932	0.758	0.755	0.762	0.786	0.755	0.761	0.841	0.799

Table 5: Economic Growth, Institution Building and other Country Characteristics: Correlations

GDP per capita growth is the annual average growth of real GDP per capita over 1992 to 2004. Log of initial real GDP per capita is measured in 1992 in US dollars. Institutional Development is the average of six principal component indicators: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. FSU is a dummy variable that takes on value one for countries of the Former Soviet Union other than Russia. Ethnic fractionalization is probability that two randomly selected individuals in a country are not from the same ethnic group. Landlocked is a dummy that takes on value one for countries that do not have direct access to the sea. CMEA Trade share is the share of trade with Council of Mutual Economic Assistance (CMEA) partners in GDP in 1990. EU Accession is a dummy variable that takes on value one for the countries that joined the EU in 2003. Tertiary enrollment is the ratio of total enrollment in institutions of tertiary education, regardless of age, to the population of the age group that officially corresponds to this level of education. Civil war is a dummy variable that takes on value one for countries that have suffered a civil conflict over the period 1992-02. Distance from Vienna is measured in kilometers and refers to the capital of the respective country. Initial liberalization is a principal component indicator of three liberalization indexes (for price, trade, and ownership) in 1990. Speed of liberalization is a principal component indicator of the changes in the price, trade and ownership liberalization indexes over the period 1990-97. Voucher privatization is a dummy variable if the country opted for mass privatization (as compared to direct sales or equity offerings). Government consumption is the share of government consumption in GDP, averaged over the sample period. Monetary growth is the annual growth rate of reserve money, averaged over 1992-2004.

	GDP per capita growth	Log(GDP per capita 1992)	Institutional Development	FSU	Ethnic Fractionalization	Land-locked	CMEA Trade Share	Tertiary enrolment	EU Accession	Civil War	Distance from Vienna	Initial liberali-zation	Speed of liberali-zation	Voucher privati-zation	Government consumption
Log(GDP per capita 1992)	0.159														
Institutional Development	0.504**	0.621***													
FSU	-0.237	-0.516***	-0.494**												
Ethnic Fractionalization	-0.471**	-0.253	-0.297	0.510**											
Landlocked	-0.312	-0.179	-0.307	0.251	0.097										
CMEA Trade Share	-0.186	-0.267	-0.395*	0.809***	0.228	0.199									
Tertiary enrolment	-0.306	0.313	0.082	0.318	0.099	-0.465**	0.389*								
EU Accession	0.421**	0.659***	0.805***	-0.237	-0.270	-0.177	-0.066	0.130							
Civil War	0.118	-0.545***	-0.431**	0.145	-0.183	0.000	-0.097	-0.384*	-0.408**						
Distance from Vienna	-0.338	-0.534***	-0.694***	0.634***	0.478**	0.399*	0.352*	0.070	-0.499**	0.253					
Initial liberalization	0.181	0.654***	0.527***	-0.634***	-0.318	-0.184	-0.512**	0.014	0.428**	-0.175	-0.528***				
Speed of liberalization	-.054	-0.411**	0.021	0.357*	0.264	-0.070	0.172	0.045	-0.053	0.016	0.232	-0.776***			
Voucher privatization	-0.269	-0.308	-0.105	0.489**	0.331	0.129	0.311	0.158	-0.151	0.026	0.309	-0.498**	0.656***		
Government consumption	-0.093	0.527 ***	0.393*	-0.157	0.119	-0.157	0.067	0.101	0.407**	-0.326	-0.429**	0.342	-0.188	0.006	
Monetary growth	-0.198	-0.114	-0.594***	0.378*	-0.006	0.139	0.461**	0.390*	-0.609***	0.065	0.284	-0.333	-0.133	0.000	-0.183

Table 6: Institution Building and Economic Development

The first stage regression is Institution Building = $\alpha + \beta_1$Initial Raw Exports + β_2 Years under Socialism + β_3 Initial + ε. The second stage regression is Economic Development = $\alpha + \beta_1$ Predicted value of Institution Building + β_2 Initial + ε. Institution Building is Institutional Development, Change in Rule of Law, Change in Corruption or EBRD reform in 1996. Institutional Development is the average of six principal component indicators: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. In regression (2) we exclude influential outliers as identified using the approach described in Besley, Kuh and Welsch (1980). Change in Rule of Law (Corruption) is the difference in the principal component indicator of Rule of Law (Control of Corruption), computed by KKM and the respective ICRG measure for the first year of political transition, converted to a variable with mean zero and standard deviation of one. The EBRD reform index is an average of reforms in the areas of enterprise reforms, competition policy, banking sector reform, and reform of non-banking financial institutions in 1996. Initial Raw Exports is the share of fuel, ores, and metal exports in GDP measured in the first available year of the sample period. Time under the socialist regime is measured by Years under Socialism. Economic Development is annual average growth of real GDP per capita or annual average growth of household consumption per capita, over the period 1992 to 2004. Initial is initial real GDP per capita or initial household consumption per capita. The null-hypothesis of the F-test is that the exogenous excluded variables do not explain Institutional Development in the first stage. The null hypothesis of the test of overidentifying restrictions is that the instruments are not correlated with the residuals. Finally, we report β_1 from the OLS regression: Economic Development = $\alpha + \beta_1$ Institutional Development + β_2 Initial + ε. Detailed definitions and sources are presented in Appendix Table A1. P-values are given in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	GDP per capita growth 92-04	GDP per capita growth 92-04	GDP per capita growth 92-04	GDP per capita growth 92-04	GDP per capita growth 92-04	Household consumption growth per capita, 92-04
Institutional Development	0.026	0.029				-0.038
	(0.036)**	(0.013)**				(0.008)***
Log (Initial dependent variable)	-0.006	-0.007	-0.003	-0.004	-0.011	0.068
	(0.567)	(0.418)	(0.670)	(0.651)	(0.479)	(0.000)***
Change in Rule of Law			0.022			
			(0.039)**			
Change in Corruption				0.026		
				(0.035)**		
EBRD Reform 1996					0.040	
					(0.118)	
Observations	24	20	24	24	24	19
F-test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
Test of overidentifying restrictions (p-value)	0.749	0.437	0.348	0.478	0.839	0.603
OLS coefficient	0.024	0.027	0.016	0.017	0.014	0.046
	(0.024)**	(0.033)**	(0.042)**	(0.065)*	(0.197)	(0.030)**

Table 7: Institution Building and Economic Development: Robustness Tests

The first stage regression is Institutional Development = $\alpha + \beta_1$Initial Raw Exports + β_2 Years under Socialism + β_3 Log(GDP per capita 1992) + β_4 X+ ε. The second stage regression is GDP per capita growth 92-04 = $\alpha + \beta_1$ Predicted value of Institutional Development + β_2 Log(GDP per capita 1992) +β_3 X + ε. Institutional Development is the average of six principal component indicators: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. Residual Institutional Development is the residual of a regression of Institutional Development on initial price, trade and ownership liberalization and speed of reform in these areas. Initial Raw Exports is the share of fuel, ores, and metal exports in GDP measured in the first available year of the sample period. Time under the socialist regime is measured by Years under Socialism. X is a vector of control variables. FSU is a dummy variable that takes on value one for countries of the Former Soviet Union other than Russia. Ethnic fractionalization is probability that two randomly selected individuals in a country are not from the same ethnic group. Landlocked is a dummy that takes on value one for countries that do not have direct access to the sea. CMEA Trade share is the share of trade with Council of Mutual Economic Assistance (CMEA) partners in GDP in 1990. EU Accession is a dummy variable that takes on value one for the countries that joined the EU in 2003. Distance from Vienna is measured in kilometers and refers to the capital of the respective country. Tertiary enrollment is the ratio of total enrollment in institutions of tertiary education, regardless of age, to the population of the age group that officially corresponds to this level of education. Civil war is a dummy variable that takes on value one for countries that have suffered a civil conflict over the period 1992-02. Initial liberalization is a principal component indicator of three liberalization indexes (for price, trade, and ownership) in 1990. Speed of liberalization is a principal component indicator of the changes in the price, trade and ownership liberalization indexes over the period 1990-97. Voucher privatization is a dummy variable if the country opted for mass privatization (as compared to direct sales or equity offerings). Government consumption is the share of government consumption in GDP, averaged over the sample period. Monetary growth is the annual growth rate of reserve money, averaged over the sample period. The null-hypothesis of the F-test is that the exogenous excluded variables do not explain Institutional Development in the first stage. The null hypothesis of the test of overidentifying restrictions is that the instruments are not correlated with the residuals. Finally, we report β_1 from the OLS regression: Economic Development = $\alpha + \beta_1$ Institutional Development + β_2 Log(GDP per capita 1992)+β_3 X + ε. Detailed definitions and sources are presented in Appendix Table A1. P-values are given in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Institutional	0.026	0.027	0.023	0.023	0.026	0.027	0.029	0.024	0.043		0.025	0.027	0.032
Development	(0.047)**	(0.034)**	(0.060)*	(0.084)*	(0.101)	(0.092)*	(0.052)*	(0.077)*	(0.097)*		(0.044)**	(0.013)**	(0.015)**
Residual Institutional										0.086			
Development										(0.029)**			
Log(GDP per capita	-0.006	-0.006	-0.007	-0.005	-0.007	-0.006	0.001	-0.004	-0.008	0.005	-0.008	-0.000	-0.007
in 1992)	(0.585)	(0.569)	(0.413)	(0.603)	(0.472)	(0.580)	(0.923)	(0.677)	(0.496)	(0.545)	(0.402)	(0.995)	(0.502)
FSU	-0.001												
	(0.935)												
CMEA Trade share		0.006											
		(0.893)											
Ethnic fractionalization			-0.057										
			(0.142)										
Landlocked				-0.008									
				(0.409)									
EU Accession					0.002								

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
					(0.894)								
Distance from Vienna						0.000							
						(0.974)							
Civil war							0.025						
							(0.067)*						
Tertiary enrolment								-0.009					
								(0.545)					
Initial liberalization									-0.015				
									(0.349)				
Speed of liberalization									-0.017				
									(0.350)				
Voucher privatization											-0.014		
											(0.165)		
Government												-0.034	
Consumption												(0.112)	
Monetary growth													0.023
													(0.376)
Observations	24	24	24	24	24	24	24	24	24	24	23	24	24
F-test (p-value)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.048**	0.000***	0.000***	0.000***
Test of overidentifying restrictions (p-value)	0.688	0.771	0.623	0.778	0.723	0.532	0.384	0.325	0.725	0. 621	0.168	0.545	0.918
OLS result	0.024	0.025	0.021	0.022	0.021	0.024	0.027	0.020	0.036	0.039	0.025	0.026	0.031
	(0.029)**	(0.022)**	(0.039)**	(0.052)*	(0.190)	(0.067)*	(0.028)**	(0.070)*	(0.012)**	(0.056)*	(0.017)**	(0.009)***	(0.009)***

Appendix Table A1: Definitions of Variables and Sources of Data

Variable	Definition	Source
Institutional Development	Measure of institutional development in 1996 along six dimensions: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. Measure is a principal components indicator of these six components with a mean of zero and a standard deviation of one.	Kaufman, Kraay and Mastruzzi (2004).
Initial Raw Exports	Share of fuel, ores, and metal raw exports in GDP in the first available year of the sample period.	World Development Indicators (WDI)
Gar reserves/population	Natural gas reserves in trillion cubic meters in 1990 proven recoverable reserves divided by population	World Resources 1996-97 and WDI
Years under Socialism	Number of years under socialism.	De Melo et al. (2001)
EBRD reform	Average of four indices measuring reforms in the areas of enterprise reform, competition policy, banking sector reform and reform of non-banking financial institutions.	EBRD (2001) Transition Report
FSU	Dummy variable that takes a value of one if the country was part of the former Soviet Union (other than Russia), and zero otherwise.	Own calculations.
Executive Constraints 1930	De facto political independence of chief executive of a country, measured in 1930, ranging from 1 (unlimited authority) to 7 (executive parity or subordination)	Polity IV
Ethnic Fractionalization	Probability that two randomly selected individuals in a country are not from the same ethnic group.	Alesina et al. (2003)
Landlocked	Dummy variable that takes a value of one if the country is landlocked, and zero otherwise.	Own calculations.
CMEA trade share	Share of trade with CMEA partners in GDP in 1990.	De Melo et al. (1996).
Tertiary enrollment	Ratio of total enrollment in institutions of tertiary education, regardless of age, to the population of the age group that officially corresponds to this level of education.	World Development Indicators
EU accession	Dummy variable that takes a value of one if the country joined the European Union in 2003.	European Commission
Civil war	Dummy variable that takes a value of one if there was a civil war in the country during 1992-2004	Murrell (1996).
Distance from Vienna	Distance of the capital from Vienna, in kilometers	Gleditsch and Ward (2001)
State Antiquity	An index of how long the country has been the site of a nation-state, kingdom or empire during the past 2000 years	Bockstette et al. (2002)
GDP per capita	Gross domestic product divided by total population in US dollars	WDI
GDP per capita growth	Average annual growth rate of real GDP per capita in constant local currency, averaged over 1992 to 2004	WDI
Household consumption growth per capita	Average annual real growth rate of financial household consumption expenditure per capita over the period 1992 to 2004.	WDI
Initial liberalization	Principal component indicator of three liberalization indexes (price, trade, and ownership) in 1990.	De Melo et al. (2001).
Speed of liberalization	Principal component indicator of the changes in the price, trade and ownership liberalization indexes over 1990-97.	De Melo et al. (2001).
Voucher privatization	Dummy variable that takes a value of one if the country opted for mass privatization (as compared to direct sales or equity offerings), and zero otherwise.	EBRD (1998) Transition Report and Estrin (2002).
Government consumption	Share of government consumption in GDP, averaged over 1992-2004.	WDI
Monetary growth	Average annual growth rate of reserve money, averaged over 1992-2004.	WDI