Institution Building and Growth

in Transition Economies

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Abstract: 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 by influencing the political structure and process during the initial years. Our empirical analysis shows that countries that are more reliant on natural resources and spent a longer time under socialist government are more likely to see former communists remain in power and to start the transition process with less open political systems, with negative repercussions for the development of market-compatible institutions. 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 US dollars varied between 500 and 8,000 for the countries in this region, it varied between 400 and 12,000 in the year 2002.[1] During the same period, GDP per capita increased by 51 percent in Poland and shrank by 63 percent in neighboring Ukraine. While all transition economies faced the difficult task of building new market-compatible institutions, this process, and the speed and success of reform more generally, 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. For example, while Poland and Turkmenistan started off with approximately the same level of GDP per capita in 1990, Poland's GDP per capita increased to more than twice the level of that of Turkmenistan by 2002.[2] 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

[1] The gap in GDP per capita as measured by PPP dollars opened in similar terms. While in 1992, income in PPP dollars ranged from 1,100 to 10,800, it varied between 900 and 16,400 in 2002.

[2] This comparison is based on WDI data of GDP per capita in PPP dollars. The difference in US dollars is even stronger in 2002.

policies and initial (economic) conditions to explain the dramatic variation in growth across transition economy (for an overview, see Svejnar 2002).[3] 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. 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 Bolton 2002). Countries like Lithuania and the Slovak Republic, while making substantial progress in the implementation of macroeconomic reforms, failed to impose hard budget constraints on ailing state enterprises during the initial phase of transition. The Kyrgyz Republic, Moldova, Russia and the Ukraine, while making progress early on in liberalizing and privatizing their economies, got stuck in a so-called reform trap because of the capture of the state by the former nomenclatura and well-connected early entrants (also known as oligarchs) (Murphy et al. 1991). These countries failed to contain expropriation of minority shareholders and extensive tunneling of assets (Johnson et al. 2000), and the new entrants raised formal and informal entry barriers to

[3] As Roland (2002) points out, research has limited the set of initial conditions largely to initial economic conditions and geographic variables, rather than initial political conditions, such as the power of the non-communist elite.

prevent further entry, thereby stemming economic growth (Murphy et al. 1993). On the other extreme, countries like Tajikistan and Turkmenistan have emerged as the least reformed (World Bank 2002). GDP per capita in 2002 in both Tajikistan and Turkmenistan was lower than at the start of the transition period, and their backward-looking approach can hardly be seen as a viable strategy for sustainable growth.[4] As the Greek philosopher Heraclitus would have said: "One cannot step into the same river twice".

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. If the rents are large enough, which is usually the case in natural resource rich countries, the elite may capture the state and block further reforms to encourage entry and to establish sound institutions. 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

[4] Please note that our sample period ends in 2002 and we can therefore not take into account recent political events.

their power to influence the transition process, and we use 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 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, had a stronger presence of the former socialist elite in parliament and had less competitive political system at the beginning of transition. Further, the exogenous component of strength of the former communist rulers and lack of political competitiveness explained by natural resource reliance and the extent to which the socialist elite was entrenched are negatively associated with 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 development 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 first decade of transition, 1992 through 2002. We test the robustness of our results by using alternative proxies for economic development, such as growth in electricity consumption and household consumption, and by adjusting the sample period for each country according to the start of political transition. 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 (economic) conditions, macroeconomic policies and reform strategies. Once we control for institutions, we do not find a

robust effect of reform strategies, macroeconomic policies, and initial conditions on economic growth.

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. This literature was spurred by the collapse of socialism and the transition to capitalism of the economies in Central and Eastern Europe and the former Soviet Union. 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) construct an index of liberalization for the transition countries (that includes price liberalization, trade liberalization, capital account liberalization, privatization, and banking reforms), and find a positive relationship between progress of liberalization and output growth. Fischer et al. (1996) and Selowsky and Martin (1997) confirm their results using alternative specifications but the same liberalization index. Macroeconomic policies, in particular 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). Finally, 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). 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.

This paper is also critically linked to the literature on the relationship between institutional development and economic growth. North and Thomas (1973), Jones (1981) and North (1981) discuss the importance of good institutions for economic development. Acemoglu, Johnson and Robinson (2001) and others (including 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. Easterly and Levine (2003) and Rodrik et al. (2004) show that institutions are more robustly associated with faster economic growth than policies. This literature focuses specifically on the importance of property rights for economic development. Secure property rights have been shown to positively impact economic growth through their impact on financial development and firm investment (Besley 1995, Johnson et al. 2002, Beck et al. 2003, and Claessens and Laeven 2003).

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 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 on the relationship between institutions and growth in transition economies 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.[5] 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.[6] 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.

We would like to stress 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 control for reverse causation and simultaneity bias, the specification tests applied to test the appropriateness of instruments are notoriously weak, so that we cannot confidently claim a causal effect of initial

[5] At a micro-level, McMillan and Woodruff (2002) present results that show a positive link between property rights institutions, entrepreneurship, and firm performance. Their results can be interpreted as evidence in support of a positive relationship between property rights institutions that support contracting and economic growth.
[6] Only the first paper considers the possibility of endogeneity between growth and institutions but uses only one instrument: ethnolinguistic fractionalization.

political conditions on institutional development and of institutions on economic growth. Rather we are more careful in our interpretation; our results suggest that the positive association of natural resource reliance, socialist entrenchment, lack of political openness and institution building and slower economic growth are not driven by reverse causation or simultaneity bias.

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 the initial openness of the political system and the power of the (former) Communist party at the beginning of transition. Finally, we show that there is a robust relationship between institution building and initial political openness, including between the component of political openness explained by natural resource endowment and entrenchment of the socialist elite and subsequent 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 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. By allowing for the efficient enforcement of contracts, the institutional framework encourages market-based commercial and financial transaction. 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. Further, the intrinsic relationship of the old institutions with the communist political regime enforced the call and the need for 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". 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 is well-organized, generally uncorrupt, and relatively benevolent. It restricts itself to providing basic goods, such as contract enforcement, law and order." Government in the second group of countries is disorganized and bureaucrats act in their private interests. Frye and Shleifer (1997) have called this the "grabbing hand" model, according to which "the government consists of … bureaucrats pursuing their own agendas, including taking bribes."

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. Large natural resources serve as a power base for the elite and affect its incentives towards the building of new market-compatible institutions. 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. 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.[7]

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

[7] We should note that it does not matter for our hypothesis whether economic power post-transition rests with a political elite that emerged from the ruling elite during communism or with a newly emerged elite of businessmen that were able to take advantage of the (mass) privatization process and grabbed assets at deeply discounted prices. In both cases, the economic elite will not support the establishment of general property rights and will use its power to influence the political process. The only difference is that in the case where the political elite is not identical to the economic elite, the political influence may come at a cost to the economic elite in the form of payments to the political elite. However, in most countries the ruling elite was replaced by a new political elite (e.g., Boris Yeltsin and his supporters in Russia) that was well-connected to the new economic elite (e.g., oligarchs such as Boris Berezhovsky).

largely determined by the country's time under socialism. One of the consequences of an extended time under socialism was the absence of civil society institutions and social networks, such as churches, political clubs, and trade unions. Combined with political censorship of media and press, this led to a situation in which there were no significant interest groups to challenge the power of the political incumbents (as in Becker 1983). Elites in countries that were under socialism for a long time are likely to be more entrenched because the centralization of power under socialism eroded the power of any political opposition. 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 an entirely new political elite is more likely to emerge during the transition period and take over from the ruling elite under socialism. Our theory 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 less 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 (former) communists remained in power in both countries. For many citizens of both countries, the Soviet economic and social structure had provided a social safety net and certainty, and the need for

economic reforms was not apparent (World Bank 2002). Because of its strong historical link to Russia, Belarus has 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. Only following the election of president Kuchma in 1994, has Ukraine expressed some commitment in moving toward a market economy. Nevertheless, the business environment is still plagued by government interventions, weak property rights, onerous taxes, and corruption. Not surprisingly, Ukraine's economic growth performance has been the worst of all transition economies except Tajikistan over the period 1992-2002.

We posit that resource endowments and entrenchment of the socialist elite together influenced the political structure at the beginning of transition. Elites that were less entrenched and in economies less dependent on natural resources had less incentives to clinch to power and were thus more likely to allow an open and competitive political system. This initial political structure, on the other hand, had crucial repercussions for the type of property rights that emerged during the transition period, and in particular the degree of opposition to 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 two effects of natural resource endowments and entrenchment on initial political structure and institutional development are complimentary is confirmed by the data. For example, while there is little variation in the degree of political entrenchment across former FSU countries there is a large variation in endowments within FSU

[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. Please note that our sample period and discussion ends in 2002, so that we cannot take into account more recent political events.

[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).

countries. As a result, even within the group of 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 political 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 Per Petrosian, which 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 2002 has been the one of the highest among all transition economies. 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] Furthermore, why would one expect the nationalists to extract fewer rents than the former nomenclatura did? A key difference between the two countries is the endowments of natural resources, Armenia having relatively

[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).

few natural 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 (among the lowest of all transition economies). 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 not surprisingly won by the ex-Communist Party, but economic decline led to strikes and a call for new elections in March 1992 that were won by the Democratic Party, ending 47 years of communist rule. Albania is an example of a country where despite a powerful communist regime, a democratic government came to power. Because of a lack of natural resources, the benefits and rents associated with political power were much smaller in Albania than in countries like Kazakhstan, Tajikistan and Turkmenistan that have 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, resulting in a GDP per capita growth over the period 1992 to 2002 of more than 6 percent on average, the highest in our sample.

Our paper is closely related to a series of paper 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 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 the internal consistency of the group and the resources on which their power is based. AJR (2001, 2002) use the colonialist experience of 70 developing countries to show the importance of institutions for economic development. They show that these institutions have been persistent over the last centuries, originally formed by the colonial power who established settler colonies with broad-based market-oriented institutions or extractive colonies with institutions aimed at extracting natural resources and subjecting the populations, depending on natural conditions encountered by the original colonizers. They also show that colonization was an exogenous shock to these societies, which actually led to a reversal in economic development in many countries (AJR, 2002). Similarly, we conjecture that the transition in the early 1990s was an exogenous event, which led to a change in the economic paradigm. As extensively discussed in the literature, there was a rapid destruction of institutions that served to support socialism; the building of new institutions, however, was a much slower process, and, as we will discuss in the following section, a disparate process across the different transition economies, which were subject to the same (or at least a similar) institutional framework during socialism.

2. Measuring Institution Building

Figure 1 shows the disparity in institution building across the 24 transition economies in our sample. We use an indicator compiled by EBRD that averages scores for enterprise reforms, competition policy, banking sector reform and reform of non-banking financial institutions, with values between one and four. While not an indicator of institution development, this variable

measures some of the legislative and regulatory inputs into institution building. While some countries, most notably Hungary and Poland started earlier and thus with more reformed institutions in 1991, the gap between these early reformers and others has widened, with Belarus, Tajikistan and Turkmenistan having undertaken little reforms or even reversed reforms.

While the EBRD index is an important measure of legislative and regulatory reforms that may foster institutional development, we would like to have a broad indicator of institutional development across countries.[11] Unfortunately, no such indicator exists for all 24 countries in our sample before 1996. We therefore focus on a broad indicator of institutional development, as computed by Kaufman, Kraay and Mastruzzi (2003, 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.[12] Each of the six measures is a principal component indicator 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, 1998, 2000 and 2002, we will focus on the indicators for 1996, the earliest available time period.

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

[11] While a large literature has discussed historical and political determinants of institutional development, there is little if any cross-country evidence linking specific reforms to institutional development.

[12] 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 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.

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 – not surprisingly – 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 increases from 1996 to 2002 from 0.62 to 0.77, suggesting that the institutional gap discussed above 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. As shown in Figure 1, there was not much variation in the legislative and regulatory basis for market-based institutions at the beginning of the transition period.[14] 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 between ICRG measures of Rule of Law and Corruption at the beginning of the transition period and the

[13] Other transition countries are excluded because of missing data. We only include the transition economies of Europe and Central Asia, because the transition process in China, and Vietnam were not started directly by the Gorbatchev's reform movement. Further, while in the process of economic transition, these countries are still governed by nominally Communist parties.

[14] That is, with the exception of Hungary and Poland, that started out with a significantly higher level of the reform index. Our results are robust to the exclusion of these two countries from the sample. Figure 1 also shows that institutional reform has varied widely across transition economies during the 1990s, with variation in the reform index increasing over time. While the EBRD reform index averaged 1.17 across the 24 countries with a standard

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.

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 discussed above, as a measure of legislative and regulatory inputs into institutional development. 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, Socialist Entrenchment and Initial Political Structure

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 can explain 48% of cross-country variation in Institutional Development. In robustness tests, we use gas reserves per capita as indicator of endowments with natural resources. We do not find a significant correlation between natural resource reliance and the rate of depreciation or

deviation of 0.33 in the year 1991, the average and the standard deviation of the reform index increased to 2.25 and 0.60, respectively, by the end of the 1990s.

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.[15] Variation in Years under Socialism can explain 58% of variation in Institutional Development.

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, as illustrated in Figure 2. Here, we mark the countries with natural resource reliance and Years under Socialism above the median value. 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

[15] Our sample consists of transition economies that have been under socialism for at least four decades. We assume that this is long enough for the socialist system to consolidate, to use the term coined by Kornai (1992), and that consolidation is more robust for countries that were under socialism for a longer period of time. As Kornai points out, a citizen of Czechoslovakia who left university in 1948, the year the communists took power, would be a senior citizen by the time communist power collapsed in 1989, and would thus have spent a work life time under socialism, which Kornai argues is long enough for the attributes of the socialist system to develop fully.

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.

We use two measures of initial political structure. First, we use Executive Constraints (Polity IV) in 1992, which measures on a scale from one to seven the de facto political independence of the chief executive, i.e. the president or prime minister, of the country, with higher values indicating fewer possibilities to take political decisions unilaterally and without consultation with other political institutions. AJR (2001, 2002) argue that Executive Constraints are a causal factor in determining institutional change and that constraints on the executive critically determine the power of the political elite. Figure 3 illustrates the high correlation between Executive Constraints in 1992 and Institutional Development in 1996. Most countries that are above the median for Executive Constraints are also above the median for Institutional Development. As an alternative indictor, we use Executive Constraints in the first year after political transition started to thus adjust for the different start of the transition period across Central and Eastern Europe.[16]

Our second indicator of the initial political structure is the share of seats in Parliament of the former ruling communist party in the first election after transition began (Hoff, Horowitz and Milanovic, 2004). This ranges from zero in Armenia and Estonia to 86% in Belarus. Five countries that did not have free elections after transition are coded with 100%: Azerbaijan, Kazakhstan, Kyrgyz Republic, Tajikistan and Turkmenistan. When coding political parties in

transition countries, it is important to take into account that many seemingly new parties were spun off from the former communist parties, and their political leaders were former communists that shared the same ideology. Hoff, Horowitz and Milanovic (2004) take this into account when calculating the share of seats held by the former communist party. Because it is inherently difficult to code the ideologies of political parties and their leaders during transition – after all, most newly emerged political leaders were former communists or at least had connections to the communist party – we use the more general and objective indicator of Executive Constraints as our base measure of initial political structure. Importantly, with the exception of a few countries such as Croatia that experienced a civil war, the nature of the political regime has not changed much during the transition period, despite the fact that many countries have seen multiple governments since the start of transition (World Bank 2002).[17]

4. Initial Political Structure and Institution Building in Transition Economies - Results

The results in Table 2 provide evidence that natural resource reliance and time spent under socialism critically influence the openness of the political system at the beginning of the transition. Both Years under Socialism and Initial Raw Exports enter negatively and significantly at the 6% level in the regression of Executive Constraints in 1992 indicating that countries with a longer socialist heritage and more reliant on natural resources had less open political systems at the beginning of transition. Together, these two variables are jointly significant at the 1% level and explain 45% of variation in political openness at the beginning of transition (column 1).

[16] Following Falcetti et al. (2002), we use the following starting years of transition: 1989 for Hungary and Poland, 1990 for Bulgaria, Croatia, Czech Republic, FYR of Macedonia, Romania, Slovak Republic, and Slovenia, 1991 for Albania and the Baltic States, and 1992 for the remaining FSU countries.

Our finding of a significant relationship between socialist entrenchment, endowment with natural resources and initial political openness is robust to controlling for other factors that might have impacted initial political openness and to using alternative indicators of initial political openness and of endowments with natural resources. There is no evidence that FSU countries experienced a stronger role of communists in post-communist political life (column 2). Years under Socialism, on the other hand, enters significantly at the 3% level, suggesting that the distinction between the 11 original countries constituting the Soviet Union and the other transition economies is more important for the political structure after transition began than having been a member of the Soviet Union or not. Column 3 shows that political openness at the beginning of transition did not vary with the degree of ethnic fractionalization, while Years under Socialism and Initial Raw Exports still enter significantly at the 7% level. Landlocked countries did not start the transition process with significantly more or less political openness and controlling for landlocked economies does not affect our findings (column 4). Similarly, close economic links with other transition economies, measured by the Trade Share with CMEA partners relative to GDP in 1990 does not affect our results. Interestingly, a larger trade share with CMEA partners is associated with more political openness in 1992 (column 5). The level of education, measured by enrollment in tertiary education, is not significantly related with political openness in 1992 and does not change our results (column 6). Column 7 shows initial raw exports in GDP can explain cross-country variation in political openness in 1992 across the 14 FSU countries in our sample. Our results are thus not only driven by the difference in Years under Socialism, but also by different endowments with raw materials.[18] Using gas reserves per

[17] There have been nine governments in Poland, seven in Estonia, and five in Hungary during the 1990s (World Bank 2002).

[18] When we rerun the regression without the Baltic States and Moldova, Initial Raw Exports still enters negatively and significantly with a p-value of 10.1%.

capita as indicator of endowments with natural resources strengthens our results – this alternative indicator of endowments enters at the 1% level, while Years under Socialism enters at the 5% level (column 8). Finally, we confirm our findings using two alternative indicators of political openness at the beginning of the transition process, the share that the former Communist party received in the first election and Executive Constraints in the year when political transition started (columns 9 and 10).

The results in Table 3 provide evidence for our hypothesis that the process of institution building is related to the component of the initial political structure that is explained by the dominance of natural resources in the economy and the historic experience during the socialist period. Here we utilize two stage least square regressions, where we regress Executive Constraints 1992 or other indicators of initial political structure on Years under Socialism and Initial Raw Exports in the first stage and then regress Institutional Development on the predicted value of our indicator of initial political structure 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 initial political structure in the first stage. For comparison purposes, we also report for each regression the OLS coefficient on Initial Political Structure for the respective regression.

Executive Constraints 1992 enters positively and significantly at the 1% in both the OLS and IV regression (column 1). The test of overidentifying restrictions is not rejected and (as already shown in Table 3), Years under Socialism and Initial Raw Exports enter jointly

significant in the first stage regression. Our two alternative indicators of initial political structure, Communist Share and Initial Executive Constraints, enter both significantly at the 1% level and with the expected sign (columns 2 and 3).

Using alternative indicators of institution building confirms our finding. In columns 4 and 5, 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. This has the disadvantage that we have to take the same value for all FSU countries and for all Yugoslav republics.[19] Using these indicators of institutional change confirms our findings. Executive Constraints enters positively and significantly in both OLS and IV and the specification tests confirm our econometric model. Finally, in column 6, we use the institutional reform indicator, constructed by EBRD for 1996. Using the institutional reform rather than the institutional development indicator confirms our results.

The Table 4 results show that even when controlling for other potential determinants of institutional development, Executive Constraints 1992 enters positively and significantly at the one percent level. Controlling for strong links to the political and economic past, as measured by an FSU dummy and the trade share with CMEA partners, does not alter the results (columns 1 and 2). [20] Ethnic fractionalization or being landlocked does not seem to have an impact on institution building (columns 3 and 4). 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

[19] 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.

rates. Our results do not provide evidence for either hypothesis. In column 5 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. We also control for the EU accession process, since the prospect of future EU membership might have fastened institution building, both through political incentives and through assistance from the original EU member states. Surprisingly, the dummy variable for the countries that entered the EU in 2004 does not enter significantly, contrary to theoretical predictions by Roland and Verdier (2003) (column 6). Countries suffering from civil war during the 1990s were not more or less likely to experience institution building (column 7). Repressed inflation during the pre-transition era also does not alter the results (column 8). 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. The initial state of price and trade liberalization and importance of the private sector does not seem to be associated with institution building, and neither does the speed with which countries liberalized prices, open the trade regime and privatized (columns 9 and 10). 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. In column 10, we control for a principal component indicator of changes in price, trade and ownership liberalization, thus controlling for the speed of

[20] This is also confirmed with a simple t-test between Institutional Development in FSU vs. non-FSU countries. Whereas this test is insignificant, the difference between the original FSU countries and all other countries is

liberalization rather than the initial conditions. Neither the initial level nor the changes in liberalization enter significantly in the regression. Our indicator of institution building thus captures different dimensions of the reform process than macroeconomic reforms. Finally, the privatization technique does not seem to matter (column 11). 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).[21] Rather than being sold to strong outside 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). 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 that have the resources to obstruct institutional development (Barberis et al. 1996 and Frydman et al. 1996). However, we cannot find an independent effect of the privatization technique on institutional development. In all regressions, however, Executive Constraints enters positively and significantly in both OLS and IV and the specification tests confirm our model.

Overall, the results in Tables 2, 3 and 4 support our hypothesis of institution building in transition economies. Countries whose economy is more based on natural resources and whose socialist governments were more entrenched have seen more powerful communist presence in Parliament after transition started and less open political systems. These countries have also 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

significant.

[21] Several countries also used the method of management-employee buyouts to privatize enterprises.

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 2002. Growth in GDP per capita over the sample period varies between –4.9% in Tajikistan to 6.4% in Albania, with an average of 1.2% and a standard deviation of 3.2% (Table 1). As an alternative indicator, we use growth over the period from T to 2002, where T is the first year after the beginning of political transition. As in the case of Initial Executive Constraints, we follow Falcetti et al. (2002) to define the beginning of the transition period. Using country-specific growth periods allows us to focus on the period after the start of transition and abstract from the initial output slump that could be observed across all transition economies. On the other hand, this country-specific timing might be controversial and subject to interpretation.

Using GDP data for transition economies is often seen as problematic since the statistical capacity to measure market output was only being developed after the start of the transition process, so that GDP numbers especially in the early years of transition are rather unreliable

(Shleifer and Treisman, 2005). Further, using official GDP numbers to proxy for economic development does not control for the activities of the informal economy. While this is not a problem for countries where the informal economy is a stable share of the overall economy and thus grows at the same rate as the formal economy, the transition period has been characterized by a rapid growth of the informal economy (Johnson, Kaufmann and Shleifer, 1997; Schneider and Ernste, 2000). Focusing on GDP per capita growth would therefore underestimate economic development. Further, if the growth of the informal economy is negatively related to institutional development, this might bias the results of our growth regression upwards. We therefore use two alternative indicators of economic development that are less subject to the criticism of failing to capture the activity of the informal sector. First, we use the growth rate of electric power consumption per capita over the period 1992 to 2002. Estimates of electricity consumption are often being used to back out the informal economy share of economic activity (Johnson, Kaufmann and Shleifer, 1997). Second, we use the growth rate in final household consumption expenditure per capita in constant local currency, averaged over the period 1992 to 2002. Household consumption might be a more direct measure of economic welfare than GDP, since it focuses on market-based consumption by the population.

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.[22] As in the previous section, we present the first-

[22] We do not use initial political structure as instrumental variable, since we are significantly less confident about its exogeneity than in the case of natural resource endowments and Years under Socialism.

stage F-test and the test of overidentifying restrictions (OIR). 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 electricity or household consumption per capita as indicators of economic development, we include the log of initial electricity consumption or household consumption per capita, respectively. 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 will describe these variables as we discuss the different robustness tests.

2. Institutions and Growth: Results

The results in Table 5 suggest a strong relationship between the exogenous component of institutional development and GDP per capita growth over the transition period until 2002. 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 2.5 percentage points per year – almost one standard deviation in GDP per capita growth, which adds up to a difference in GDP per capita after ten years of 28 percent.

The remaining columns in Table 5 show the robustness of our results to alternative indicators of institution building and economic development. Columns 2 and 3 show that our results are robust to the use of 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 1% level. Similarly, the EBRD indicator of institutional reforms enters positively and significantly at the 5% level (column 4). Our findings are also confirmed when using alternative indicators of economic development, though at lower significance levels. When using growth in household consumption per capita as an indicator of economic development, Institutional Development enters positively with a p-value of 0.061 (column 5). When using growth in electricity per capita, Institutional Development enters positively with a p-value of 0.075 (column 6). In this case, however, the test of overidentifying restrictions is rejected, shedding doubt on the econometric specification. Finally, when calculating GDP per capita growth over country-specific sample periods depending on the start of political transition, Institutional Development enters positively and significantly at the 5% level (column 7). 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 larger than the OLS coefficients, consistent with Kraay and Kaufman (2002).

Table 6 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 the 5% level. The first-stage F-test and 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 were part of the Former Soviet Union 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. Our results in column 1, however, show no significant effect of being a FSU country or not on GDP per capita growth, while the positive and significant impact of the exogenous component of Institutional Development is confirmed.

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 indeed find that more ethnic fractionalization has a negative and statistically significant impact on economic growth. However, the positive effect of institutional development on economic growth remains highly significant (column 2).

Countries that are landlocked do not grow faster, while controlling for this geographic country trait does not affect our main finding (column 3).[23]

Next, we control for the share of trade with Council of Mutual Economic Assistance (CMEA) partners in GDP in 1990. Countries with greater trade links to other CMEA countries

can be expected to have greater output slumps and slower recoveries as they adjust their industrial structure and re-orient their trade flows. However, trade dependence on CMEA partners does not enter significantly, while Institutional Development continues to enter significantly and positively (column 4).

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 5 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 at the 5% level.[24]

In column 6, 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 direct investment from EU countries) by including a dummy variable for the countries that entered the EU in 2003.[25] While this dummy variable does not enter significantly, Institutional Development still enters positively at the 5% level.

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 is 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

[23] 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.

[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.

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.

Next, we control for repressed inflation. While repressed inflation does not enter significantly, Institutional Development continues to enter positively and significantly (column 8).

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 columns 9 and 10, 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.[26] 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. 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 at the 1% level. 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

[25] 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.
[26] We also tried the individual liberalization indicators with the same results.

significantly at the 1% level (column 12). Finally, we control for the growth rate of reserve money as proxy for the monetary policy stance. While monetary growth does not enter significantly, Institutional Development continues to enter positively and significantly at the 1% level (column 13).

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. On the one hand, there are the eight Eastern European countries that joined the EU in 2003; in spite of some setbacks, they have generally experienced a rapid build-up of market-compatible institutions and economic transformation and development, often with help (in the form of financial and technical assistance) from the EU, World Bank and other bi- and multilateral institutions. On the other hand, several Central Asian countries (as well as some Eastern European countries, such as Moldova) have seen institutional destruction, and no corresponding construction of market-compatible institutions; many of these countries have also experienced negative growth over the transition period. 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 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 degree to which former communists were able to retain power and the degree of political openness at the beginning of the transition process. Further, the component of the initial political structure explained by natural resource reliance and years under socialism can explain the large variation in the building of market-compatible institutions we have observed over the last decade across transition economies. 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 and initial political structure. Finally, we relate the exogenous component of institutional development explained by natural resource dominance and socialist entrenchment to GDP per capita growth (averaged over the period 1992 to 2002), and find a strong and significant positive relationship. This finding is robust to controlling for a large number of macroeconomic, initial and other country characteristics.

Our findings confirm the importance of institutional development for economic growth. They are thus complementary to studies by AJR (2001, 2002) who use the colonization experience as exogenous event to assess the relationship between institutional and economic development. Similarly, we use the shock that the transition countries experienced in the early 1990s as starting point for our analysis. Our findings show that the quality of institutions is endogenous to the political environment and the structure of the economy. In many transition economies, political entrenchment of the socialist elites and rent-seeking opportunities offered by an abundance of natural resources have negatively impacted the creation of new market-compatible institutions, with negative repercussions for economic development. Thus, using the shock experience of transition economies as a way to deal with endogeneity problems, we offer new evidence on the relationship between institutions and economic development.

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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. Executive Constraints 1992 is the de facto political independence of the chief executive of a country, measured in 1992, ranging from 1 (unlimited authority) to 7 (executive parity or subordination). Communist share is the share of seats of the former Communist party in the first elections after the start of transition. Initial Raw Exports is the share of fuel, ores, and metal exports in GDP in the first available year of the sample period (generally 1992). Time under the socialist regime is measured by Years under Socialism. GDP per capita growth is the average growth rate in real GDP per capita over the period 1992 to 2002. Detailed definitions and sources are presented in Appendix Table A1.

	Institutional Development	Executive Constraints 1992	Communist share	Initial Raw Exports	Years under Socialism	GDP per capita growth
Albania	-0.11	5	67.6	1.00	45	6.43
Armenia	-0.37	5	0	3.90	71	6.19
Azerbaijan	-0.87	3	100	13.33	71	-1.75
Belarus	-0.81	7	86.0	4.08	74	1.13
Bulgaria	-0.15	7	52.8	7.99	43	1.53
Croatia	-0.23	3	23.8	6.02	44	3.83
Czech Republic	0.78	7	16.0	3.85	42	2.16
Estonia	0.58	7	0	4.14	51	4.00
Georgia	-0.71	5	25.6	2.49	70	-0.00
Hungary	0.64	7	8.4	2.73	40	3.20
Kazakhstan	-0.59	3	100	12.59	71	1.33
Kyrgyz Republic	-0.30	4	100	5.83	71	-2.23
Latvia	0.20	7	29.4	0.51	51	3.46
Lithuania	0.23	7	3.5	5.47	51	1.76
Macedonia	-0.35	5	25.8	6.17	44	-0.61
Moldova	-0.22	5	30.0	1.26	51	-3.70
Poland	0.52	6	37.6	4.85	41	4.21
Romania	-0.14	5	66.4	2.84	42	1.57
Russia	-0.58	5	30.0	12.02	74	-0.82
Slovak Republic	0.28	7	14.7	11.60	42	3.17
Slovenia	0.70	7	17.5	3.00	44	3.92
Tajikistan	-1.68	3	100	55.18	71	-4.90
Turkmenistan	-1.22	1	100	31.76	71	-1.56
Ukraine	-0.52	4	53.1	3.58	74	-4.46
Average	-0.21	5.21	45.3	8.25	56.2	1.16
Standard deviation	0.62	1.74	35.8	11.88	13.8	3.15

Table 2: Determinants of Initial Political Structure

The regression equation is Initial Political Structure = $\alpha + \beta_1$Initial Raw Exports + β_2 Years under Socialism + $\beta_3 X + \varepsilon$. Initial Political Structure is Executive Constraints 1992, Communist share or Initial Executive constraints. Executive constraints is the de facto political independence of the chief executive of a country, measured in 1992 or the first year of political transition, ranging from 1 (unlimited authority) to 7 (executive parity or subordination). Communist share is the share of seats of the former Communist party in the first elections after the start of transition. 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). 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. 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 access to the sea. CMEA Trade share is the share of trade with Council of Mutual Economic Assistance (CMEA) partners in GDP in 1990. 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. Gas reserves/population is natural gas reserves in trillion cubic meters in 1990 proved recoverable reserves divided by population. The regression in column (6) excludes all countries for which Years under Socialism are 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)	(8)	(9)	(10)
Dependent variable	Executive constraints 1992	Executive constraints 1992	Executive constraints 1992	Executive constraints 1992	Executive constraints 1992	Executive constraints 1992	Executive constraints 1992	Executive constraints 1992	Communist share	Initial Executive constraints
Years under Socialism	-0.047	-0.086	-0.045	-0.047	-0.078	-0.062		-0.051	0.010	-0.050
	(0.039)**	(0.027)**	(0.068)*	(0.036)**	(0.000)***	(0.014)**		(0.035)**	(0.077)*	(0.046)**
Initial Raw Exports	-6.217	-5.874	-6.133	-6.095	-5.947	-5.620	-7.709		1.158	-6.557
	(0.051)*	(0.065)*	(0.065)*	(0.071)*	(0.093)*	(0.073)*	(0.040)**		(0.008)***	(0.063)*
FSU		1.207								
		(0.190)								
Ethnic fractionalization			-0.941							
			(0.499)							
Landlocked				-0.111						
				(0.835)						
CMEA Trade share					5.766					
					(0.053)*					
Tertiary enrollment						0.845				
						(0.108)				
Gas reserves / population								-4.469		
								(0.004)***		
Observations	24	24	24	24	24	24	14	24	24	24
R-squared	0.454	0.489	0.461	0.455	0.540	0.490	0.388	0.445	0.406	0.447

Table 3: Initial Political Structure and Institution Building

The first stage regression is Initial Political Structure = $\alpha + \beta_1$Initial Raw Exports + β_2 Years under Socialism + ε. In the second stage regression Institution Building is regressed on the predicted value of Initial Political Structure. Initial Political Structure is Executive Constraints 1992, Communist share or Initial Executive constraints. Executive constraints is the de facto political independence of the chief executive of a country, measured in 1992 or the first year of political transition, ranging from 1 (unlimited authority) to 7 (executive parity or subordination). Communist share is the share of seats of the former Communist party in the first elections after the start of transition. 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. 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. 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, and 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. The null-hypothesis of the first stage F-test is that Initial Raw Exports and Years under Socialism do not jointly explain Initial Political Structure. The null hypothesis of the test of overidentifying restrictions is that Initial Raw Exports and Years under Socialism are not correlated with the error terms from the second stage regression. Finally, we report the coefficient from an OLS regression of Institution Building on Initial Political Structure. 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	Institutional Development	Institutional Development	Institutional Development	Change in Rule of Law	Change in Corruption	EBRD reform 1996
Executive Constraints 1992	0.458			0.464	0.424	0.340
	(0.000)***			(0.001)***	(0.001)***	(0.000)***
Communist share		-2.368				
		(0.000)***				
Initial Executive Constraints			0.435			
			(0.000)***			
Observations	24	24	24	24	24	24
F-test (p-value)	0.004***	0.000***	0.006***	0.004***	0.004***	0.004***
Test of overidentifying restrictions (p-value)	0.571	0.710	0.609	0.340	0.413	0.470
OLS coefficient	0.269	-1.222	0.231	0.161	0.197	0.218
	(0.000)***	(0.000)***	(0.000)***	(0.055)*	(0.008)***	(0.000)***

Table 4: Initial Political Structure and Institution Building: Robustness Tests

The first stage regression is Executive Constraints 1992 = $\alpha + \beta_1$Initial Raw Exports + β_2 Years under Socialism + β_3 X + ε. The second stage regression is Institutional Development = $\alpha + \beta_1$Predicted value of Executive Constraints 1992 + β_2X+ ε. Executive constraints 1992 is the de facto political independence of the chief executive of a country ranging from 1 (unlimited authority) to 7 (executive parity or subordination). 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. 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. X is a vector of control variables. FSU is a dummy variable that takes on value one for countries of the Former Soviet Union. 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. 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. EU Accession is a dummy variable that takes on value one for the countries that joined the EU in 2003. Civil war is a dummy variable that takes on value one for countries that have suffered a civil conflict over the period 1992-02. 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). The null-hypothesis of the first stage F-test is that Initial Raw Exports and Years under Socialism do not jointly explain Initial Political Structure. The null hypothesis of the test of overidentifying restrictions is that Initial Raw Exports and Years under Socialism are not correlated with the error terms from the second stage regression. Finally, we report β_1 from an OLS regression: Institutional Development = β_1 Executive Constraints 1992 + β_2X+ 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)
Dependent variable	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development
Executive Constraints 1992	0.401 (0.000)***	0.382 (0.000)***	0.463 (0.000)***	0.466 (0.000)***	0.422 (0.000)***	0.455 (0.018)**	0.477 (0.004)***	0.421 (0.002)***	0.392 (0.000)***	0.458 (0.000)***	0.462 (0.000)***
FSU	-0.208 (0.270)										
CMEA Trade share		-1.603 (0.133)									
Ethnic Fractionalization			0.147 (0.801)								
Landlocked				0.053 (0.795)							
Tertiary enrollment					-0.342 (0.131)						
EU Accession						-0.095 (0.840)					
Civil war							0.161 (0.696)				

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dependent variable	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development	Institutional Development
Repressed inflation								-0.006			
								(0.418)			
Initial Liberalization									0.152		
									(0.073)*		
Speed of liberalization										-0.092	
										(0.395)	
Voucher privatization											0.061
											(0.808)
Observations	24	24	24	24	24	24	24	24	24	24	24
F-test (p-value)	0.004***	0.001***	0.013**	0.004***	0.003***	0.100*	0.040**	0.028**	0.008***	0.003***	0.009***
Test of overidentifying restrictions (p-value)	0.944	0.893	0.555	0.583	0.997	0.404	0.586	0.730	0.957	0.842	0.341
OLS coefficient	0.229	0.258	0.259	0.259	0.268	0.135	0.248	0.220	0.237	0.273	0.269
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.063)*	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***

Table 5: 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. 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, and 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 (generally 1992). Time under the socialist regime is measured by Years under Socialism. Economic Development is annual average growth of real GDP per capita, annual average growth of household consumption per capita or annual average growth of electricity consumption per capita. Initial is initial real GDP per capita, initial household consumption per capita or initial electricity consumption per capita. T in column 7 is the year after the beginning of political transition in the respective country. 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)	(7)
Dependent variable	GDP per capita growth 92-02	GDP per capita growth 92-02	GDP per capita growth 92-02	GDP per capita growth 92-02	Household consumption growth per capita, 92-02	Electricity per capita growth, 92-02	GDP per capita growth, T-2002
Institutional Development	0.040				0.040	0.032	0.040
	(0.001)***				(0.071)*	(0.013)**	(0.002)***
Log (Initial dependent variable)	-0.007	-0.003	-0.004	-0.015	-0.034	-0.033	-0.005
	(0.552)	(0.683)	(0.676)	(0.414)	(0.008)***	(0.124)	(0.606)
Change in Rule of Law		0.036					
		(0.002)***					
Change in Corruption			0.041				
			(0.001)***				
EBRD Reform 1996				0.061			
				(0.025)**			
Observations	24	24	24	24	17	23	24
F-test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Test of overidentifying restrictions (p-value)	0.886	0.455	0.659	0.848	0.127	0.035**	0.887
OLS coefficient	0.035	0.025	0.027	0.026	0.030	0.033	0.034
	(0.001)***	(0.007)***	(0.009)***	(0.015)**	(0.081)*	(0.005)***	(0.003)***

Table 6: 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 92-02 = $\alpha + \beta_1$ 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. 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 a vector of control variables. FSU is a dummy variable that takes on value one for countries of the Former Soviet Union. 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. 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). 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 1992-2002. 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	0.031	0.036	0.038	0.037	0.037	0.043	0.044	0.038	0.038	0.042	0.039	0.041	0.045
Development	(0.027)**	(0.001)***	(0.006)***	(0.003)***	(0.002)***	(0.005)***	(0.002)***	(0.003)***	(0.006)***	(0.003)***	(0.002)***	(0.001)***	(0.003)***
Log(GDP per capita	-0.006	-0.008	-0.006	-0.006	-0.004	-0.004	0.003	-0.007	-0.008	-0.010	-0.010	-0.003	-0.008
in 1992)	(0.557)	(0.368)	(0.582)	(0.568)	(0.706)	(0.697)	(0.728)	(0.527)	(0.471)	(0.399)	(0.320)	(0.795)	(0.526)
FSU	-0.014												
	(0.302)												
Ethnic fractionalization		-0.071											
		(0.076)*											
Landlocked			-0.007										
			(0.570)										
CMEA Trade share				-0.032									
				(0.534)									
Tertiary enrollment					-0.012								
					(0.422)								
EU Accession						-0.009							
						(0.593)							
Civil war							0.036						
							(0.011)**						

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Repressed inflation								-0.000					
								(0.682)					
Initial liberalization									0.003				
									(0.578)				
Speed of liberalization										-0.005			
										(0.281)			
Voucher privatization											-0.020		
											(0.073)*		
Government consumption												-0.024	
												(0.329)	
Monetary growth													0.021
													(0.507)
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***	0.000***	0.000***	0.000***	0.000***
Test of overidentifying restrictions (p-value)	0.481	0.999	0.860	0.872	0.574	0.801	0.599	0.957	0.839	0.979	0.227	0.936	0.583
OLS result	0.030	0.031	0.033	0.033	0.029	0.037	0.039	0.032	0.038	0.034	0.037	0.035	0.040
	(0.007)***	(0.001)***	(0.006)***	(0.002)***	(0.004)***	(0.015)**	(0.001)***	(0.003)***	(0.001)***	(0.004)***	(0.001)***	(0.002)***	(0.004)***

Appendix Table A1: Definitions of Variables and Sources of Data

Variable	Definition	Source
Institutional Development	Measure of institutional development in 1996. This variables measures institutional development along six dimensions: voice and accountability, government effectiveness, rule of law, regulatory quality, absence of corruption, and political stability. The 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 (2003).
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 p[roved recoverable reserves divided by population	World Resources 1996-97 and WDI
Years under Socialism	Number of years under socialism.	De Melo et al. (2001)
Executive Constraints 1992	De facto political independence of chief executive of a country, measured in 1992, ranging from 1 (unlimited authority) to 7 (executive parity or subordination)	Polity IV
Communist share	Share of seats in parliament of the former communist party resulting from the first elections after the start of transition. One implies autocratic regime.	Hoff, Horowitz, and Milanovic (2004)
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, and zero otherwise.	Own calculations.
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 is one of the eight countries that joined the European Union in 2003.	European Commission, Enlargement website.
Civil war	Dummy variable that takes a value of one if there was a civil war in the country during 1992-2002	Murrell (1996).
Repressed inflation	Increase in deflated wages minus the change in real GDP over the period 1987 to 1990	De Melo et al. (1996).
GDP per capita	Gross domestic product divided by total population in US dollars	WDI
GDP per capita growth	Average annual real GDP per capita growth	WDI
Electricity growth per capita	Average annual growth rate of electric power consumption per capita over the period 1992 to 2002.	WDI
Household consumption growth per capita	Average annual real growth rate of financial household consumption expenditure per capita over the period 1992 to 2002.	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 if the country opted for mass privatization (as compared to direct sales or equity	EBRD (1998) Transition Report

Variable	Definition	Source
	offerings), and zero otherwise.	and Estrin (2002).
Government consumption	Share of government consumption in GDP, averaged over 1992-2002.	WDI
Monetary growth	Average annual growth rate of reserve money, averaged over 1992-2002.	WDI

Figure 1: Institutional reform across transition economies, 1991-2002

This graph shows the development of the EBRD reform index for the 24 countries in our sample over the period 1991-2002. The EBRD reform index is the average of four sub-indices that measure progress in the following areas: enterprises reform, competition policy, banking sector reform and reform on non-bank financial institutions. These indices go from one to four with higher values indicating wider ranging reforms. Source: EBRD Transition rep

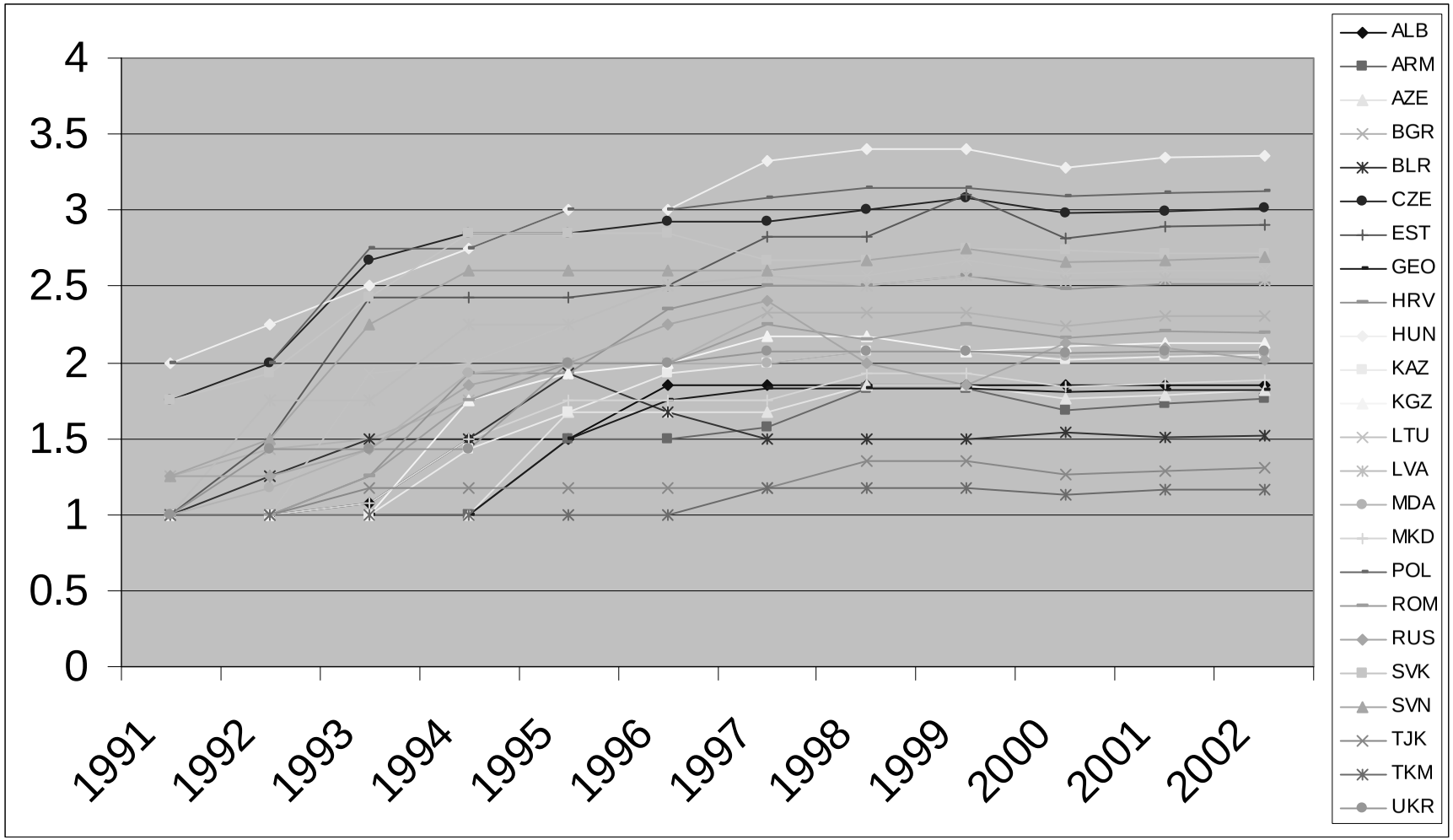

Figure 2. Initial Raw Exports and Years under Socialism Across Transition Economies

Figure 3: Initial Political Structure and Institution Building Across Transition Economies