Social Capability, History and the Economies of Communist and Post-Communist States

by Peter Iliev and Louis Putterman*

Abstract

It has been shown, for non-Communist developed and developing countries, that earlier development of agriculture, a dense population, and a state-level polity is associated with a higher income and more rapid economic growth in the late 20th Century. We investigate whether this was also the case for countries under Communism and for the same countries in transition to a market economy. Our findings are generally affirmative, with an interesting pattern for the Eurasian socialist core countries involving higher growth nearer their west European and east Asian poles. We also find that ethnic fractionalization, which is correlated with late pre-modern development, shows harmful effects in the transition era but not under Communism.

JEL codes: P27, N10, O40

Keywords: economic growth, transition, Communism, history, ethnic fractionalization

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0. Introduction

In recent years, a large number of studies have investigated institutional, social, geographic and historical determinants of differences in rates of growth and levels of development among countries in the developed and developing worlds (Acemoglu *et al*. (2002), Easterly and Levine (1997), La Porta *et al*. (1997), Hall and Jones (1999), Knack and Keefer (1997), Sachs and Warner (1997), Sala-i-Martin (1997)). Due to data problems and the assumed inapplicability of the theories concerned, the economies of Communist and former-Communist countries have been excluded from almost all of these studies. Yet there have been large differences in performance among the once-Communist countries as well, and there are reasons to suspect that historical, social and geographic factors can help to explain them. In the heyday of Soviet-style socialism, Marxist countries with stronger bureaucratic capabilities, like the Soviet Union and China, achieved higher rates of big-push, heavy industry growth than did countries with less capacity for economic mobilization, like Vietnam and Ethiopia. Even more noticeably, the age of transition from Soviet-style socialism has seen more rapid rates both of reform and of economic growth in neighbors of Europe's and Asia's successful capitalist economies—for example the Baltic states, the Czech Republic, and Slovenia, in the West, and China, especially its coastal provinces, in the East—than in countries like Ukraine, Russia, Kazakhstan and, again, Vietnam.

In this paper, we investigate historical and geographic influences on the performance of countries under Communism and in transition. Our primary conceptual lens is the social capability or evolutionary approach to economic growth developed by Abramovitz (1995), Temple and Johnson (1998), and Putterman (2000), an approach pursued empirically by Burkett *et al*. (1999), Bockstette *et*

al. (2003), Hibbs and Olsson (2004), and Chanda and Putterman (2004). These authors contend that social capabilities develop over long periods of time, influenced initially by differences in the timing of the transition to agrarian civilization and subsequently by geographic and other determinants of the diffusion of technological and organizational innovations. We provide the first application of this approach to the analysis of the economic performance of once-Communist countries both during their periods of Communism and during their periods of transition. Section 1 begins the paper with a brief exposition of the social capability and evolution approach. In Section 2, we discuss how the approach might apply to countries that attempted to build their economic systems on the Soviet model, and we survey the historical and geographic characteristics of former Communist and Marxist states. Section 3 presents quantitative explorations of the relationship between early development and the nature and performance of planned economies, while Section 4 does the same for the post-Communist transition economies. Section 5 summarizes and concludes the paper.

1. Social Capability and Long-Period History

In his book *Guns, Germs and Steel: The Fates of Human Societies*, biologist-turned-geographer-historian Jared Diamond attempts to answer the question of a New Guinea friend: "Why is it that you [Western people] have all the cargo [modern, manufactured goods] while we don't have any cargo?" Diamond sees this as being much the same as asking why it was Spaniards who sailed across the Atlantic and conquered the rich and populous domains of the Aztec emperor Monteczuma and the Inca emperor Atahuelpa, rather than Aztecs or Incas subduing Spain. Why also, he asks, did Western Europeans eventually colonize most of Africa, Australia, New Zealand, the inhabited islands of the Indian and Pacific oceans, and parts of Asia? Answering this question, he argues, requires an explanation of why it was the peoples of the core Eurasian societies (Mesopotamia, Egypt, Iran, India

and China) who were the first to practice intensive forms of agriculture and animal husbandry, to live in cities, to employ horses and iron weapons in warfare, and to develop literate civilizations that shared agricultural and other technologies and awareness of one another's existence.

The starting point for Diamond lies in the relative availabilities of domesticable grain-precursor plant species and large animals, and in differences in geographic conditions for the diffusion of technology, especially similarity or difference of climate and growing season across contiguous land masses. Productive agricultures led to high population densities which led ultimately to the establishment of large-scale polities whose need to administer irrigation systems and other public works spurred the development of writing and mathematics, and whose need to maintain armies promoted the development of metallurgy, wheel-based carriage, ship-building, and ultimately the use of gun-powder and the compass.

Diamond's approach falls squarely in the tradition of social evolutionism in which other notable contributors include Ester Boserup (1965), Marshall Sahlins (1972), and Ellman Service (1971).[1] The key ideas, for our purposes, are that (a) the transition from hunting and gathering to agriculture had vast but geographically differentiated repercussions for technological change and social organization, (b) the degree of intensification of agriculture, which correlates strongly with population density, is a possible proxy for the degree of technological and organizational sophistication of a society, (c) there is a close link between the way in which a society's people procure their livelihood and their forms of economic, social and political organization (e.g., what we call "the state" appears only with the development of agriculture and animal husbandry), and (d) changes in these dimensions occur initially over relatively long periods of time (the transition from

[1] An interesting analysis relying on archeological evidence to demonstrate the similarity of the progression from village to state to empire in the New World with that which occurred independently and earlier in the Old World is Sanders and Marino (1970). Recent anthropological discussions using a social evolutionary framework include Johnson and Earle (1987) and Shifferd (1987).

the first cultivation of cereals to the emergence of empires took more than a thousand years) but gradually accelerate with advances in the means of diffusing innovation, including by expansion and conquest.

Sociologists Gerhard Lenski and Patrick Nolan (1999) suggested that the societies of sub-Saharan Africa and New Guinea, in which cultivation was mainly done by manual power aided by tools like digging sticks and hoes, remained at a developmental disadvantage compared to those in which the plow was used. Lenski and Nolan (1984) tested this hypothesis with a simple dummy variable (for "horticultural" versus "agricultural" societies) and found it to be supported. Burkett, Humblet and Putterman (1999), adapting Boserup's focus on agricultural intensification and population density, hypothesized and found statistical support for the idea that more densely populated countries with more farmers per unit of cultivated land and with greater use of irrigation were achieving more rapid economic growth between 1960 and 1990. Their findings were reconfirmed for a larger sample of 77 developing countries as well as for 93 developed and developing countries together by Chanda and Putterman (2002), studying economic growth in the years 1960 to 1995.

Bockstette, Chanda and Putterman (2002) used a different indicator in the social evolutionist tradition, the early development of state level polities, to examine the effects of early development on recent rates of economic growth and income levels. They constructed, for 100 present-day countries, an index of the presence of states between the years 1 and 1950. They found this index to be one of the best predictors of the rate of economic growth during 1960 to 2000, whether in a sample composed of developing countries alone or in a mixed sample of developed and developing countries. They also found it to be significantly correlated with the per capita income level (as opposed to rate of growth) in 2000. Early development was found to be more weakly correlated with income in

1960, a fact that Chanda and Putterman (2004a) explain by reference to the "reversal of fortune" that Acemoglu, Johnson and Robinson (2002) document to have taken place in the non-European world during the long era of European expansion following 1500.

Hibbs and Olsson (2004) conduct a direct test of Diamond's hypothesis. They construct a measure of "biogeographical" initial conditions based on the identified existence in the wild, in six world regions, of (a) large-seeded grasses from which grains could be domesticated, and of (b) precursors of domesticated animals such as horses, sheep and pigs. After demonstrating that the biogeography measure accurately predicts the known time of transition from hunting-and-gathering to agriculture in these regions, they also show that the transition year itself is capable of predicting 53% of the variance in log 1997 per capita income among 112 present-day countries and 43% of the variance of a much-used measure of "institutional quality" (the ICRG country risk index), and that the transition year, an index of geography, and the institutional quality measure together predict 80% of the variance in log 1997 income.

Chanda and Putterman (2004b) link the literature on social and technological evolution to the ideas of Abramovitz (1986, 1995) and Temple and Johnson (1998). Noting the tendency of European and European-settled countries to converge to similar income levels but the failure of many of the poorest countries to catch up during the 20th Century, Abramovitz argued that the idea of convergence—that is, the expectation that poorer countries will grow faster than richer countries, *ceteris paribus*—must be tempered by consideration of the organizational or institutional capabilities of different societies. "[A] country's potential for rapid growth is strong" he wrote "not when it is backward without qualification, but rather when it is technologically backward but socially advanced" (Abramovitz, 1986). Temple and Johnson (1998) proposed a test of Abramovitz's idea using an index of social capability—the average of what are in essence a set of indicators of

modernization—based on work in the 1960s by Irma Adelman and Cynthia Morris (1967). Temple and Johnson found that their "social capability" index predicted well countries' rates of economic growth in the years 1960 to 1985. Chanda and Putterman point out that the notions of social capability used by Abramovitz and by Temple and Johnson are quite similar to what is termed "broad human capital" by Burkett *et al*. and by Putterman (2000)—a kind of collective know-how that is partly inarticulable (or tacit) and that has its expression only when the capabilities and attitudes of people holding different subsets of the overall social stock of knowledge operate in concert in a complex division of labor.

2. Social Capability and Socialist and Transition Economies

In the studies discussed in the previous section as well as almost all of the post-1990 endogenous growth literature (Barro and Sala-i-Martin, 2004, Weil 2004), data for countries that adopted the Soviet-type economic system, especially the core countries of east and central Europe and the former Soviet Union, has tended to be absent due to problems of comparability and availability and the concern that the structural models being tested might not apply in the absence of a market economy. Thus, like other historical, geographic, and social factors, the notion that different social capabilities based on differences in early development may help to explain countries' varying experiences in the attempt to achieve modern economic growth has not, to our knowledge, been applied to countries under Marxist regimes and in transition from socialism.

Early development and social capability may have influenced which countries became socialist.[2] As is widely recognized, Communist regimes took hold not in the most advanced capitalist countries such as England and the United States, but in less advanced countries like Russia, which

[2] The term 'socialist' is used here and in the remainder of this paper in the sense applied by ruling Communist parties in the Soviet Union and similar states, where state or "social" ownership of the major means of production was a defining

Marxists viewed as a potential "weak link" in the chain of capitalist economies. But there seem also to have been limits to the degree of "backwardness" compatible with the system put in place in the Soviet Union. That system was associated with measurable transformations of agrarian into industrial economies in countries like Russia and China, but attempts to adopt all or parts of the system in countries like Laos, Mozambique and Ethiopia were abject failures. The administrative capacity of the state was undoubtedly stronger in the former than in the latter cases. The beginnings of an industrial base and the capacity of agriculture to generate a surplus to support industrialization were also more in evidence in China and Russia than in Laos, Mozambique, Ethiopia, and for that matter Cuba, Vietnam and Cambodia.

The possibility that differences in early development affected the performances of economies under socialism is explored statistically in Section 3, while in Section 4 we explore the influence of economic history on performance during the transition years 1990-2002. For these explorations, we use two indicators of early development and two other measures, one social and one geographic, that are in some ways related to them. Values of the state antiquity measure used in Bockstette *et al*. and in Chanda and Putterman (forthcoming), but not previously computed for most of the countries in this paper's sample, were calculated for this study. These measures are calculated by considering the years between 1 and 1950 C.E., assigning higher values to countries that manifested political organization above the tribal level, to those in which government was indigenous rather than colonial, and to those in which such a government controlled a larger fraction of what is now the nation's territory. A time discount rate of 5% per 50 year period is used to put less weight on the distant than on the near past.[3] Our second indicator of early development follows Burkett *et al*.'s use of a measure of population density. Like Chanda and Putterman (2004a), we use an estimate of

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feature. Western 'social democracy' is accordingly excluded.

[3] For details, see Putterman (2004). In past work by the authors cited, results were robust over a wide range of discount

population density in 1500 (roughly the beginning of the era of European expansion) based on the data in McEvedy and Jones (1976). Among countries in our sample, population density in 1500 and in 1950 are highly correlated, and the results reported below for the former generally hold also for the latter.[4]

Our geographic indicator is air distance from an advanced capitalist center, whichever is closest of Berlin, Tokyo, or Washington. Distance from such centers, or from advanced capitalist countries more generally, may play some part in explaining the stronger performance of Poland and the Czech Republic versus Romania and Bulgaria, of Slovenia versus Croatia, and of China versus Mongolia, in part perhaps because of its direct impact on costs of investment and trade, but perhaps also due to the greater cultural similarities and culturally-linked ease of diffusion of practices to the more proximate countries. There is also a link to very early development: the Eurasian countries furthest from Berlin and Tokyo include Russia and the Central Asian countries, all of which had lower population densities, in most cases later-formed states, and perhaps also less highly developed administrative traditions and less widely diffused commercial cultures than the countries of Western Europe and East Asia. From Central Asia westward, differences in intercourse with Western Europe were increasingly important as the 20th Century approached: an 1897 census of the Russian Empire produced literacy figures for fifteen future Soviet republics that have a strong negative corelation (-0.769) with distance from Berlin.[5] Table 1 shows correlations between our indicators for both our

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rates.

[4] The correlation between population density of 1500 and that of 1950 is 0.74 for the 47 countries in our full sample and 0.82 for our 31 core Eurasian Communist countries (see below). Both correlations are significant at better than the 0.0001 level. That the two are so highly correlated raises the possibility that population density favorably influences economic growth simply because it facilitates transportation, trade, and specialization, rather than because it is proxying for social capabilities built up in the course of long-term development. We use the very early density indicator partly to reinforce our interpretation of the variable as an indicator of early development, but that interpretation is most importantly buttressed by the parallel and often stronger results for state history.

[5] The data can be found in Scherer, ed., 1984. The correlation is significant at the 0.1% level. Interestingly, the correlation between the 1897 literacy figures and the growth rates of the 15 ex-republics during the transition years 1991-2002 is positive and significant at the 5% level. The included former republics are Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgystan, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and

full sample of Communist and Marxist states, and for the European and Asian countries under Marxist regimes by 1955, which we call "core socialist countries." Among these core countries, those further from Berlin or Tokyo were less densely populated in the past as well as today, with a correlation between distance from those capitals and estimated population density in 1500 (*den1500*) which is significant at the 1% level (Table 1). In the core sample, there is a mild negative correlation between distance from Berlin and Tokyo and history of statehood (*statehist*), too weak to be statistically significant.

Another much-studied indicator of societal "initial conditions" that can be related to early development is linguistic heterogeneity. Often, the extension of the nation-state structure over a territory has directly contributed to linguistic homogenization, whereas its absence allows the

	Full Sample				Core Countries			
	Distance	*Statehist*	*Den1500*	*Ethnic*	*Distance*	*Statehist*	*Den1500*	*Ethnic*
Distance	1.0000 51				1.0000 32			
Statehist	-0.3380 0.0175 49	1.0000 49			-0.0879 0.6383 31	1.0000 31		
Den1500	-0.6050 0.0000 51	0.4464 0.0013 49	1.0000 51		-0.5907 0.0004 32	0.3814 0.0342 31	1.0000 32	
Ethnic	0.5576 0.0001 46	-0.2338 0.1222 45	-0.4572 0.0014 46	1.0000 46	0.3246 0.0919 28	-0.5177 0.0048 28	-0.4079 0.0312 28	1.0000 28

Table 1. Correlations among geographic, historical and social variables. Cell entries, from top to bottom, are correlation, number of cases, and *p*-value.

persistence of linguistic heterogeneity—compare the early integrated and imperially-ruled China to a country that, although smaller, had no common administration before the late 19th Century, New

Uzbekistan.

Guinea, which Diamond reports to account for as many as one sixth of the world's living languages.[6] For the core socialist countries, Table 1 shows a negative correlation between *statehist* and ethnic fractionalization (*ethnic*) that is significant at the 1% level, and a negative correlation between early population density and ethnic fractionalization significant at the 5% level.[7] In the once-socialist world, ethnic conflict has been a well-known source of political and economic instability during the transition period, particularly in the Balkans, the Caucasus and southern Russia. The core socialist countries that were more distant from Berlin or Tokyo are also more ethnically heterogeneous, with a correlation significant at the 10% level (Table 1). Easterly and Levine (1997) and others have provided evidence that ethno-linguistic heterogeneity can contribute to poor economic performance, among other reasons due to political instability or communal conflicts that their governments may respond to with economically inefficient policies.

The Appendix lists the values of our two early development measures and of the partially related measures of distance from core capitalist countries and ethnic fractionalization. With respect to early state formation, the pattern displayed by the Eurasian data (see Map 1) closely corresponds to the location of classical civilizations in the Mediterranean, the Near East, and East Asia. To the west, proximity to and hence partial or complete incorporation into the Roman Empire account for an early state presence in Germany,[8] Hungary, Romania, Albania, and the successor states of Yugoslavia,

[6] Diamond, 1998, p. 306. A counter-vailing principal of linguistic differentiation might work in the opposite direction: one usually finds more distinct members of a family of languages close to its place of origin than in places of its late dissemination (see Diamond's discussions of the origins of the Austronesian language group and of the Bantu language family). And there have been numerous empires that lacked linguistic unity. Overall, however, correlations support the early development/linguistic unity conjecture. The correlation between *statehist* and the index of ethnolinguistic heterogeneity used by Easterly and Levine, for 98 developed and developing countries, is - 0.21, significant at the 5% level (Chanda and Putterman, forthcoming).

[7] Our variable *ethnic* is the ethnic fractionalization index taken from Alesina et al., 2003, defined as the probability that two randomly selected people in a country will not belong to the same ethnic group.

[8] Although Germany is noted for its late aggregation into a modern nation-state in the 19th century, parts of its territory fell under Roman influence, and throughout medeival times, it was home to numerous kingdoms which lead to a "multiple kingdoms" rating and hence to a higher score on the state antiquity scale than in the case of lands under strictly tribal rule, although a lower score than for lands under a unified and home-based kingdom or empire. For details on calculation of the state antiquity measure see Bocktette *et al.* (2002) and, for a more complete discussion, Putterman (2004).

whereas greater distance from that sphere means an absence of states until later times in Poland, the Baltic states, Belarus, Bulgaria, Moldova, Russia, and Ukraine. To the east, there were early states in China and neighbors Korea, Vietnam, and Cambodia, but states came later to Mongolia and Laos. There were states in some lands adjacent to the ancient Near East and Persia, in territories now belonging to Armenia, Georgia, Tajikistan, Turkmenistan, Uzbekistan, and Afghanistan. But states came later to the north of that region, in Kazakhstan, Kyrgyzstan and Russia.

The negative relationship between early state formation and ethnic fractionalization is illustrated by Laos, where a state formed later than in neighboring Vietnam and Cambodia,[9] and where the ethnic fractionalization index is correspondingly sharply higher. Countries closer to the western or eastern poles of Eurasia, including Germany, Poland, China, and Korea, are more ethnically homogeneous, while those near the middle of that range, e.g. Afghanistan and the central Asian states, are more heterogeneous. Population density on the eve of the world "make-over" by European colonization also reflects these patterns: population densities tended to be higher toward the west and east and in countries with earlier introductions of state rule (Germany, Hungary, China, Korea, Vietnam—average population density 11.0) as compared with those further from Eurasia's poles and having later-formed states (Estonia, Ukraine, Russia, Kazakhstan, Mongolia—average population density 1.9). The correlation between *statehist* and *den1500* is positive and significant at the 5% level.

Although beyond the scope of our formal analysis, it is worth mentioning the connection between these patterns and the differences in the speed of political democratization and security of property rights which in recent years have become apparent to any observor of world affairs. As one moves westward, one sees an obvious increase in the speed of democratization, security of property

[9] Whereas there was a kingdom in Cambodia by the 1st century and an indigenous kingdom in Vietnam, following two centuries of Chinese control, by the end of the 2nd century, Laos had no state until it came under Khmer rule in the 5th

rights, and avoidance of corruption: compare, e.g., the Czech Republic, Hungary, and Poland with Belarus, Russia and Kazakhstan. Differences are apparent even on more local levels—e.g., the difference between Slovenia and Serbia, within the former Yugoslavia, or between the western and eastern parts of the Ukraine, much in the news as we wrote this paper. In the east, western-style democracy was only beginning to emerge in South Korea and Taiwan when market-oriented reforms began in China and Vietnam, and democracy is as yet absent in the reforming Communist states. Nevertheless, property rights appeared to be at least somewhat more secure and corruption under somewhat better control in China (corruption index 0.30) than in Russia (1.01, see Appendix), which might be one factor behind the far larger flow of foreign investment into the former than the latter.

Extending the discussion to the non-core Marxist states, most of which were in Africa and Latin America,[10] we look at the more broadly defined group of countries that had Marxist governments (as classified by Pryor, 2003) for four years or longer, and that made significant efforts to nationalize the ownership of industry, administer prices, and plan their economies. Among those countries, we find early states to be present only in Ethiopia and Somalia, on the rim of the Red Sea, and in Afghanistan. In the remaining countries, substantial states usually appeared only after European colonization (Cuba, Nicaragua, Mozambique, Sao Tome, etc.) with few exceptions in our sample.[11] Population densities both in 1500 and today tend to be lower in the African and Latin American Marxist countries, as has already been seen. Ethnic fractionalization was also much higher in many African and Latin American Marxist states than in most of the Eurasian Communist countries. For example, while the ethnic fractionalization index averages 0.25 among seven East

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century and developed indigenous kingdoms in the 12th century.

[10] One Asian country, Afghanistan, is also included in the non-core sample (see the Appendix). Although under Marxist rule for too short a period to enter any of our growth regressions, it is included in some reported correlations for the full sample. A second Asian Marxist state, Yemen, had insufficient data and thus appears in none of our computations.

[11] In our sample, only Guinea Bissau exhibits substantial pre-European state influence, exerted by the ancient Mali empire. States existed in Africa (Ghana, Mali, the Buganda kingdom, etc.) and the Americas (the Aztec and Inca empires, e.g.) prior to European contact, but not on territories later classed as Marxist states).

European countries, 0.36 among the three former-Yugoslav states for which we have data, and 0.43 in fifteen ex-Soviet republics, its average is 0.62 among fifteen African and Latin American Marxist states, with values above 0.70 in seven of those countries (all in Africa).

Unlike the Eurasian socialist countries, with their pattern of older states, greater ethnic homogeneity, and higher population densities closer to their western and eastern poles, we identify no general geographic pattern in the non-core sample.[12] When these countries are included, then, the indicator of distance from Berlin, Tokyo or Washington is less easily tied to the early development framework, on a theoretical level. A correspondence between the distance indicator and early development continues to hold in practice, however, because none of the Third World Marxist states are as close to any of the three cities as are the central European countries to Berlin or as is China to Tokyo. The fact that most of the Third World countries are more ethnically heterogeneous also contributes to a pattern within the full sample wherein ethnic fractionalization is higher in Latin America, Africa, and the middle stretch of Eurasia than on Eurasia western and eastern poles.

3. Effects of Early Development on Growth and Level of Socialization under Communism

Communist governments treated economic growth as a success criterion, and some achieved a degree of success in some periods. Does Abramovitz's suggestion that countries that enjoyed relatively high levels of social capability grew faster hold among Communist countries? In this section, we investigate the effects of our measures of early development and our related geographic and social variables on rates of growth under Communism first by examining bivariate correlations between each of our measures and a growth rate, and then in a series of simple OLS regressions. The regressions follow a conventional specification in which the average rate of growth of per capita GDP

[12] It can be noted that island and coastal countries are disproportionately represented in the African and Latin American sample, and that former Portuguese colonies in Africa are disproportionately represented among states experimenting with

over a period is the dependent variable and the log of the initial per capita GDP is the first explanatory variable. Another explanatory variable almost always included in such a regression—the investment to GDP ratio—is left out of our regressions for the Communist period due to lack of consistent data on investment rates. Versions that include a human capital measure (the secondary school enrollment ratio) were estimated but are not shown due to sharply reduced sample size, although results are qualitatively similar (see footnote 23). Each model includes a constant and only one of our historical, geographic and social indicators (*distance* from Berlin or Tokyo [and for the broader sample including other Marxist countries, from Washington], state history (*statehist*), population density in 1500 (*den1500*), or the ethnic fractionalization index (*ethnic*)), so as to avoid the multicolinearity that would arise were several of those indicators to be included.

One issue that must be addressed before we begin concerns periodization. One might assign different socialist and transition periods to each country depending on the years during which it was under each model, with China and Vietnam being classified as "in transition" once market-oriented reforms begin, despite continued Communist rule. With this approach, the rate of growth under socialism in China, for example, would be calculated for the years 1949 to 1978, the rate of growth under socialism in Bulgaria using 1947 to 1989, and so forth. A difficulty is that if the dependent variable is derived from different periods in different countries, it would be hard to control for the influence of changing conditions in the world economy and for differences in the durations of the socialist and transition periods in different countries. Also, data of comparable quality are not available for all years, e.g. for early decades of socialism in the Soviet Union. Finally, if we treated China and Vietnam in the 1980s as transitional, then what about Hungary and Yugoslavia in the 1970s, when they too were partly market-based economies? Given these problems, we adopt an alternative approach in which performance is examined for all countries in samples defined over a

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Marxist economic models. But these facts play no direct role in our analysis.

common time period. We consider the years 1990 to 2002 (1991 to 2002 for former-Soviet Union countries) as transition years in all countries, and years before 1990 as pre-transition years even in China and Vietnam, which had begun market-oriented reforms in the 1980s.[13] So as to be able to cover relatively large samples, the period studied in the present section is 1970 – 1990.[14]

For each specification, we report three regressions, which differ by sample coverage. The largest sample covers all Communist and Marxist countries that were socialist and for which data are available for at least sixteen of the 21 years 1970-1990. Growth rates and initial incomes are taken from Maddison (2003),[15] except for the ex-Soviet and ex-Yugoslav republics and ex-Czechoslovakia where they are taken from De Broek and Koen (2000), Plestina (1992) and Dedek (1996), respectively, but adjusted by us for consistency with the Maddison data.[16] We refer to this as the "full" sample. The second sample includes only those countries in the first sample for which there are data in Maddison, thus excluding, as a robustness check, the observations on former republics as separate entities.[17] We refer to this as our "no republics" sample. The last sample restores the former republics but includes only "core" Communist countries, namely all sample countries located in Eurasia (what are now Central and Eastern Europe, former Yugoslavia, former Soviet Union, and the

[13] We also do not distinguish between more orthodox socialist economies and those countries, especially Yugoslavia and Hungary, that had more market-oriented economies prior to 1989.

[14] The cost of focusing on this period is that it constitutes a small part of the socialist history of some of the countries involved, and may be unrepresentative in some cases due to the stagnation some experienced in the 1980s.

[15] With respect to the observations that we use, Maddison's data is identical to that in Groningen Growth and Development Centre Total Economy Database 2004.

[16] Different adjustments are required for the different sources. The overall Soviet growth rate assumed by DeBroek and Koen differs from Soviet growth as reported in Maddison, so we re-scale their republic growth rates by the ratio between Maddison's and their growth rate for the USSR as a whole. Dedec (1996) has data for the percentage of national income generated in Czech lands and Slovac lands in 1970 and 1989. Combining this with population data for both republics (from Maddison), we split Maddison's Czechoslovakia per capita GDP data for 1970 and 1989 into Czech and Slovak per capita GDP. Based on these estimate we calculate separate per capita GDP growth rates for Czech and Slovak lands.For Yugoslavia Plestina (1992) shows the ex-republics and total Yugoslavia's average Gross Material Product annual growth rates for 1966 to 1988. Using republic population data, we turn this into per capita growth rates and rescale them by the ratio of Maddison's 1970 to 1990 per capita GDP growth rate estimate to Plestina's 1966 to 1988 Yugoslav per capita product growth rate to get a comparable proxy for the individual republics' 1970 to 1990 per capita GDP growth rates.

[17] In place of the observations by former republic, this sample includes Maddison's observations for the Soviet Union, Yugoslavia, and Czechoslovakia.

East and Southeast Asian Communist states) except for Yemen and Afghanistan (which w+e view as a peripheral Marxist states and for which there are insufficient data in any case). We use the term "core countries" for this sample.

	Full Sample				Core Countries			
	statehist	*den1500*	*distance*	*ethnic*	*statehist*	*den1500*	*distance*	*ethnic*
Growth Rate, 1970-90	0.2721 0.0776 43	0.2038 0.1898 43	-0.3857 0.0106 43	-0.3607 0.0241 39	0.5566 0.0011 31	0.2651 0.1494 31	-0.0713 0.3283 31	-0.3175 0.0996 28
State and Coll. Share of Employment	0.3111 0.1143 27	0.5410 0.0024 29	-0.7527 0.0000 29	-0.6868 0.0003 23	-0.5001 0.0978 12	0.1964 0.5201 13	-0.4888 0.0901 13	0.4000 0.3262 8

Table 2. Correlations for Communist period. Cell entries, from top to bottom, are correlation, *p*-value, and number of observations.

The first row of Table 2 shows the simple correlations between the growth rate and our four historical, social and geographic measures for the full and core samples. All of the signs are as predicted, with the early development indicators *statehist* and *den1500* being positively correlated with the socialist era growth rate and with distance from Berlin, Tokyo and Washington and ethnic fractionalization being negatively correlated with the growth rate. In the full sample, all of the correlations except that for *den1500* are significant at the 10% level, with those for *distance* and *ethnic* being significant also at the 5% level.[18] Among the core countries, only the correlations for *statehist* and *ethnic* are significant at the 10% level, but the correlation for *statehist* is quite significant, consistent with the conjecture that the earlier-developed countries had greater social capabilities and thus greater success in operating planned economies.

Do such conclusions hold up when differences in initial income levels are controlled for? Tables 3a and 3b present our socialist era growth regressions. We note first that in all of these regressions, the coefficient on log of initial GDP is negative, consistent with convergence, but it is not

[18] If *den1500* is replaced by *den1950*, the correlation is significant at the 10% level for the full sample and at just short of

significant, indicating that the tendency for poorer socialist countries to grow faster than richer ones was not very consistent.

Table 3a presents the regressions that include the early development indicators *statehist*.and *den1500*. In the full sample regression of column 1, the coefficient on *statehist* has the predicted sign, but its *p*-value is a whisker shy of 10%. The coefficient estimates in columns 2 and 3 are of similar magnitude, with the column 5 estimate being quite insignificant, but column 3's estimate being significant at better than the 5% level.[19] Overall, and especially for Eurasia, the results support the idea that during the 1970s and 1980s, socialist countries with longer histories of civilization, like Germany and China, experienced more rapid economic growth than later developed countries like Russia and Kazakhstan, matching the result found by Bockstette *et al*. for non-socialist developing and developed countries. This implies that for operating either economic model, capitalist or socialist, the social capability built up in long-established agrarian and urban civilization was a plus. In terms of magnitude, the estimate of column 3 implies that the "youngest" state in the core group, Turkmenistan, would have had a 75% slower growth rate than the "oldest" state, China, assuming that both started with average initial per capita incomes.

Higher population density also accompanies agriculture and urban civilization. The results in columns 4 to 6 of Table 3a suggest that socialist countries with higher pre-modern population densities grew faster in the 1970s and '80s, after controlling for initial income. Coefficients on *den1500* in all three sample estimates are positive and significant at the 10% level. The coefficient magnitudes vary, but taking the most modest one, from the core countries sample (column 3), the estimate implies that the most densely populated core country, Czech Republic, should have had an

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the 10% level ($p = 0.109$) for the core country sample.

[19] A more restricted estimate, not shown, for the 11 core socialist countries only, without republics, has roughly twice the

Table 3a

Sample	Full Sample	No Republics	Core Sample	Full Sample	No Republics	Core Sample
Log of initial GDP	-1.370 (.286) -4.79*	-1.886 (0.555) -3.40*	-1.194 (0.225) -5.31*	-0.294 (0.270) -1.02	-0.408 (0.555) -0.74	-0.641 (0.274) -2.34**
Statehist	0.00228 (0.00138) 1.65	0.00239 (0.00204) 1.17	0.00318 (0.00130) 2.43**			
Den1500				83461 (45283) 1.84***	167593 (94059) 1.78**	54486 (27687) 1.97**
Constant	13.760 (2.473) 5.56*	17.726 (4.515) 3.93*	12.026 (1.933) 6.22*	2.546 (2.466) 1.03	3.256 (4.228) 0.77	5.198 2.602 2.00***
N	43	23	31	43	23	31
R^2	0.46	0.47	0.56	0.08	0.09	0.42
Adj. R^2	0.43	0.42	0.52	0.05	0.00	0.38

Table 3b

Sample	Full Sample	No Republics	Core Sample	Full Sample	No Republics	Core Sample
Log of initial GDP	-0.530 (0.299) -1.77***	-1.307 (0.735) -1.78**	-0.961 (0.254) -3.79*	-0.709 (0.278) -2.55**	-1.244 (0.644) -1.93***	-.855 (0.275) -3.11*
Distance	-0.00058 (0.00010) -5.59*	-0.00067 (0.00016) -4.11*	-0.00042 (0.00011) -4.01*			
Ethnic				-3.506 (1.112) -3.15*	-4.213 (1.705) -2.47**	-1.376 (1.174) -1.17
Constant	4.966 (2.315) 2.15**	10.02 (5.07) 1.97**	8.95 (2.11) 4.24*	8.371 (2.401) 3.49*	12.402 (4.930) 2.52**	8.845 (2.23) 3.98*
N	43	23	31	39	19	28
R^2	0.11	0.16	0.39	0.26	0.33	0.35
Adj. R^2	0.06	0.07	0.34	0.22	0.25	0.30

Table 3. Communist-era growth and historical, geographic, and social factors. OLS regressions. Dependent variable: growth of per capita GDP, 1970-1990. Cells show estimated coefficients, standard errors (in parentheses), and t-statistics. *** = significant at 10% level, ** = at 5% level, * = at 1% level

average growth rate roughly one and a third times higher than that of the least densely populated core

absolute magnitude and is significant at almost the 5% level.

country, Russia, had both been at the sample mean in all other respects.[20]

For *distance*, our principal interest lies in the core socialist countries of Eurasia, so we comment first on column 3 of Table 3b. In this estimate for 31 core socialist countries and republics that became countries in the 1990s, the coefficient on *distance* indicates that the rate of growth was significantly faster in countries closer to Berlin or Tokyo, significant at the 1% level. For each 1,000 kilometers further from the nearest terminus, growth falls by about 0.4%, so that a country mid-way between the two poles would be expected to have grown at about 1.78 % less per year assuming average initial income, a substantial disadvantage. Our interpretation of the distance measure as representing proximity to the heartlands of both early civilizations and modern capitalism applies less directly to the world sample, but columns 1 and 2 of the table show that the same qualitative result holds in the broader sample of Communist and Marxist states.[21]

Consider, finally, ethnic fractionalization, which studies have found to impact negatively on economic growth in other countries. The estimate for the full sample, in column 4, and that for the world sample without republic-level observations, column 5, suggest that this was also the case in socialist countries. However, the coefficient on *ethnic* in column 6 is smaller in absolute value and is not statistically significant. Perhaps this result should not surprise us, because it has been much noted that ethnic tensions were held in check in the former Soviet Union and Yugoslavia, only to be unleashed when Communist dictatorships relaxed their grips on power.[22] The significant negative

[20] That is, the annual rate of growth is predicted to have been 2.34% in the Czech Republic versus 1.01% in Russia. If *den1950* is used in place of *den1500*, similar results are obtained, with the coefficient on *den1950* being significant at the 10% level in the full sample and at the 5% level in the core sample.

[21] This result is not surprising given that we are adding Third World socialist states with notoriously poor economic performance and substantial distances from Washington, Berlin and Tokyo to the core sample for which the finding has already been ascertained. We also checked robustness by estimating the equation with only core countries, not republics, but the sample is quite small, only 11 observations. The result is a still negative coefficient on *distance*, with a *p*-value a little shy of the 10% level. The result is not shown, to save space.

[22] Recall that the column 6 result uses data on a republic-by-republic basis. This makes the result all the more striking, as many of the observations are for fairly heterogeneous individual republics of the former Soviet Union and Yugoslavia.

results for the world sample may reflect little more than the fact that ethnic fractionalization tended to be far higher in the Third World Marxist countries, which also registered substantially weaker economic performance, perhaps not so much because of their ethnic fractionalization as due to the generally lower social capabilities which we have suggested were proxied by *statehist* and *den1500* (both correlated with *ethnic*).[23]

We also wanted to investigate more formally the casual observation that more developed countries adopted a more comprehensive version of the Soviet-style socialist system, when under Communist rule, than did their less-developed (Third World) counterparts. An in-depth study might pursue this question by estimating the number of commodities allocated by central planners, which we know from sources to have been far larger in the Soviet Union than in China, larger in China than in Vietnam. However, we could not find compiled data on this for a large cross-section of countries. The only indicator of "degree of socialization" for which we could locate a substantial series of observations was the state share of employment. Since we lack a multivariate model of the determinants of the degree of socialization, we examine this issue by looking at simple correlations, only. The second row of Table 2 shows correlations for the sample of both Eurasian and Third World socialist countries.[24] The idea that the later developed, less socially advanced countries exhibited lower degrees of socialization is generally supported in the full sample: the proportion of the labor force employed in the state and collective sectors is negatively correlated with *distance*, positively correlated with *den1500*, and negatively correlated with *ethnic*, all significant at the 1% level. The

[23] As mentioned earlier, regressions paralleling those in Table 2 were also estimate with inclusion of a secondary school enrollment ratio measure for 1970. Unfortunately, this reduces the overall sample size to only 18 countries for the full sample and no republics samples (in this case identical, because republic-level data on the enrollment measure are not included in our sources) and only 7 for the core sample. The coefficient on enrollment is always positive but insignificant. The coefficients on *distance*, *statehist*, *den1500* and *ethnic* have the same signs as in Table 2, and significance levels are similar but in several cases lower, dropping below the 10% level in the case of *den1500*.

[24] The sample does not include observations for what were then republics of the Soviet Union and Yugoslavia, but instead it has observations for those countries as wholes.

correlation with *statehist* has the expected positive sign but falls short of significance at the 10% level.[25] In the core country sample (which is small because all data are at country not republic level), however, most of the correlations are insignificant, and in two cases, one of which is significant at the 10% level, they are of the "wrong" sign.[26] We can conclude that there is evidence of a correlation between the degree to which the Soviet model was adopted and indicators of related to early development for the socialist world as a whole, but not, despite the USSR-China-Vietnam comparison, for the core socialist countries more broadly.

4. Growth and Institutional Quality in Transition

Do the historical, geographical and social factors investigated in the previous section also help to explain performance differences of Communist and ex-Communist countries during the transition period? To answer this question, we examine the simple correlation of the rate of growth of per capita GDP during transition with *statehist*, *den1500*, *distance* and *ethnic*, and we estimate a series of growth regressions that include the log of initial per capita GDP, a constant, the same four explanatory variables entered one at a time, and the average investment share, available for this period in the World Development Indicators.[27] For both correlations and regressions, we consider both the full sample of core (Eurasian) and Third World ex-socialist countries, and the sample of core

[25] An important observation here is that for China, which has the oldest state but had a low state and collective share by 1987, the year for which Pryor reports it. Had China's state and collective share been measured in 1978, instead, the correlation of *statehist* and the employment share measure would be significant at the 10% level in the full sample and would not be negative and significant in the core sample.

[26] Note again that the negative significant correlation for *statehist* would not be present but for China's transition, and especially its agricultural decollectivization, in the 1980s.

[27] The rate of economic growth presents us with a slight difficulty in the transition period, because virtually all of the ex-Communist countries in eastern Europe and the former Soviet Union experienced deep declines in income followed by faster or slower recovery. An unusually deep trough, e.g. that of Bosnia, may occasion very rapid rates of subsequent growth which give a misleading impression of strong performance. We tested and found it best to use as our measure of economic performance the rate of growth of per capita income estimated for each country by linear regression. We leave out of the sample the two most problematic cases, Bosnia and Serbia. Estimates that included those two countries are not dramatically different, however.

countries only. (A 'no republics' sample is unnecessary since former republics of the Soviet Union and Yugoslavia are countries in their own rights during this period.)

	Full Sample				Core Countries			
	statehist	*den1500*	*distance*	*ethnic*	*statehist*	*den1500*	*distance*	*ethnic*
Growth Rate, 1990-2002	0.2585 0.0942 43	0.1849 0.2294 44	-0.1121 0.4688 44	-0.3931 0.0091 43	0.4482 0.0167 28	0.2646 0.1737 28	-0.3068 0.1123 28	-0.5849 0.0011 28

Table 4. Correlations with transition era growth rates. Cell entries are, from top to bottom, correlation, *p*-value, and number of observations.

Looking first at the correlations, in Table 4, we find that all of the correlations are of the predicted sign in both samples. The early development indicator *statehist* is significantly associated with the transition growth rate in the full sample and more strongly so among the core countries, but the correlation with *den1500* is not significant in either sample.[28] The distance measure fails to display significance in either case, but is not too far from significance at the 10% in the core country sample. Of the four measures, ethnic fractionalization is most strongly correlated with the growth rate in both samples.

Turning to the growth regressions shown in Table 5, we comment first on the more conventional explanatory variables. The first thing to note is that log of initial GDP shows a significant negative coefficient in none of these regressions, and it even has a positive coefficient in two of the regressions for the core countries. This may partly result from the peculiar nature of growth during the initial years of transition, with the average growth rate being negative in 10 of the 27 core countries. The investment ratio performs more conventionally, being positive in all cases and statistically significant in most of them.

[28] *Den1950* has similar positive correlations with the transition growth rate with p-values in the 15 to 20% range for both samples.

Consider now our first indicator of early development, *statehist*. In columns 1 and 2 of Table 5, the estimated coefficients on *statehist* are both positive and significant at the 5% level. Once again, the Bockstette *et al*. finding that countries with earlier states were experiencing more rapid economic growth in the late 20th Century is also confirmed for ex-socialist economies, this time in a period of transition from socialism.

Var./Sample	Full	Core	Full	Core	Full	Core	Full	Core
Log of initial GDP	-9.091 (0.411) -0.22	0.688 (0.681) 1.01	-0.265 (0.446) -0.59	-0.068 (0.750) -0.09	-0.463 (0.541) -0.86	-1.348 (0.969) -1.39	-0.652 (0.433) -1.51	0.070 (0.061) 0.11
Investment Rate	3.345 (1.183) 2.83*	2.789 (1.508) 1.85***	2.684 (1.223) 2.20**	2.962 (1.677) 1.77***	2.897 (1.239) 2.34**	3.272 (1.526) 2.14**	1.953 (1.199) 1.63	1.65 (1.526) 1.08
Statehist	0.00536 (0.00243) 2.20**	0.01213 (0.00512) 2.37**						
Den1500			123888 (90709) 1.37	106871 (121698) 0.88				
Distance					-0.00030 (0.00025) -1.21	-0.00144 (0.00068) -2.11**		
Ethnic							-6.749 (2.329) -2.90*	-11.44 (3.90) -2.93*
Constant	5.040 (3.847) 1.31	-5.061 (6.837) -0.74	6.633 (3.787) 1.75***	5.626 (5.834) 0.96	9.949 (5.105) 1.95***	19.03 (8.51) 2.24**	11.78 (3.98) 2.96*	7.322 (5.095) 1.44
N	40	27	41	27	41	27	40	27
R^2	0.24	0.31	0.16	0.17	0.15	0.28	0.29	0.38
Adj. R^2	0.18	0.22	0.09	0.06	0.08	0.19	0.23	0.30

Table 5. OLS Regressions, Dependent Variable: Growth Rate of GDP p.c., 1990-2002. Cells show estimated coefficients, standard errors (in parentheses), and t-statistics. *** = significant at 10% level, ** = at 5% level, * = at 1% level

Our other measure of early development, *den1500*, doesn't fare as well. Its regression coefficients in columns 3 and 4 of Table 5 are also both positive, but none of these bivariate or partial correlation coefficients achieves statistical significance at conventional levels.[29]

[29] Using *den1950* instead also leads to positive but insignificant coefficients. The *p*-value for the core countries (0.117) is

Our geographic measure, *distance*, has a negative coefficient in both regressions (columns 5 and 6 of Table 5), and is significant at the 5% level for the core sample. The evidence for the 27 European and Asian countries is thus at least mildly supportive of the proposition that countries nearer the ends of the west to east spectrum grew faster in the transition years than did those located further from those poles.

Finally, consider ethnic fractionalization. In columns 7 and 8 of Table 5, its coefficients in growth regressions are negative and also significant at the 1% level. This is fairly strong evidence that ethnic fragmentation—a social feature that is correlated with late development of the state and urban society—negatively influenced growth in the first thirteen years of transition.[30] And unlike the Communist period, the influence of ethnic fractionalization is not driven by inclusion of Third World observations. Our previous remark that many ethnic conflicts were held in check by Communist dictatorships only to re-emerge as sources of social tension in the transition era finds support in the contrast between the results for *ethnic* in the core sample in Table 5 and those for the same sample in Table 2.

Numerous economists have remarked that the importance of institutional factors for economic outcomes has been demonstrated perhaps as never before during the course of the transition from socialism in Eastern Europe and the former Soviet Union. The casual impression that corruption and the building of democratic political institutions have been stronger in transition countries closer to west European neighbors was mentioned in Section 2. In this section, we investigate the effects of

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in this case not very far from 10%.

[30] An earlier study of the link between ethnic heterogeneity and the performance of transition economies in eastern Europe was carried out as the senior thesis of Brown University student Lee Sabow (2001). Sabow's finding that ethnic heterogeneity was associated with poorer economic performance encouraged us to include the variable in this study.

institutions using the corruption indicator and the rule of law indicator from Kaufmann *et al*., 2000. The indicators are for the years 1997 and 1998.

Table 6 shows the correlations between these two indicators and our four historical, geographic and social variables. All of the signs are as would be expected if factors that have proven favorable to growth are also favorable to reducing corruption and increasing the rule of law. The effects of *den1500* and *distance* are statistically significant for both the full and the core country samples, while the effects of *ethnic* are significant for the full sample those of *statehist* are significant only in the full sample and only with respect to rule of law.

	Full Sample				Core			
	statehist	*den1500*	*distance*	*ethnic*	*statehist*	*den1500*	*distance*	*ethnic*
Corrupt-ion	-0.1044 42 0.5106	-0.4299 44 0.0036	0.4115 44 0.0055	0.3473 42 0.0242	-0.0494 29 0.7993	-0.4391 30 0.0152	0.6196 30 0.0003	0.2909 28 0.1332
law	0.8310 44 0.0331	0.4607 46 0.0013	-0.5366 46 0.0001	-0.4971 44 0.0006	0.0342 29 0.8601	0.4623 30 0.0101	-0.6004 30 0.0005	0.2071 28 -0.2460

Table 6. Correlations with transition era institutions. Cell entries are, from top to bottom, correlation, number of observations, and *p*-value.

To see which correlations between the two sets of variables hold after controlling for differences in country income levels, we estimated two sets of regressions in which either corruption or rule of law is the dependent variable and the independent variables are the log of 1990 per capita GDP, one of the historical geographic and social variables, and a constant. To save space, we show in Table 7 only the coefficients on the historical, geographic and social variables that are included in each regression, the *p*-value of each coefficient estimate, the number of observations in the regression, and the regression R-squared. The signs on all coefficients remain as in the Table 6 correlations, but the pattern of significance levels has changed, with both *statehist* and *den1500* now showing significant correlations with *corruption* in both full and core samples, the effects of *distance*

being significant for both *corruption* and *law* but in the core sample only, and *ethnic* having a significant effect only on *corruption* and only in the core sample. On the whole, these results are quite supportive of the idea that early development (proxied by a longer state history and greater early population density) has conferred social advantages reflected in such things as constraints on corruption, and establishment of rule of law. The pattern for *distance* in the core countries also coincides with casual empiricism: countries closer to western Europe or Japan show better control of corruption and greater rule of law.

	Full Sample				Core			
	statehist	*den1500*	*distance*	*ethnic*	*statehist*	*den1500*	*distance*	*ethnic*
corruption	-.00090 *p*=0.061 n = 39 R^2=0.27	-36455 *p*=0.035 n = 40 R^2=0.25	.00005 *p*=0.343 n = 40 R^2=0.18	.35208 *p*=0.436 n = 39 R^2=0.18	-.00119 *p*=0.090 n = 29 R^2=0.49	-27564 *p*=0.087 n = 29 R^2=0.49	.00005 *p*=0.343 n = 40 R^2=0.18	1.035 *p*=0.069 n = 28 R^2=0.51
Law	.00066 *p*=0.150 n = 41 R^2=0.30	35280 *p*=0.035 n = 42 R^2=0.37	-.00008 *p*=0.130 n = 42 R^2=0.34	-.683 *p*=0.110 n = 41 R^2=0.36	00104 *p*=0.172 n = 29 R^2=0.40	33064 *p*=0.055 n = 29 R^2=0.44	-.00008 *p*=0.130 n = 42 R^2=0.34	-.878 *p*=0.157 n = 28 R^2=0.42

Table 7. Regression coefficients and summary from OLS regressions. The dependent variable is indicated by the row heading. Cell entries are, from top to bottom, the estimated coefficient on the variable indicated by the column heading, the coefficient's *p*-value, the number of observations in the regression, and the regression R-squared. Other independent variables, not shown, are log of 1990 per capita GDP, and a constant.

Do distance, early development, or ethnic fractionalization themselves still influence the rate of economic growth in transition after controlling for their effects on the quality of institutions as reflected in corruption and rule of law? To investigate this question, we performed two sets of exercises. First, we re-estimated each OLS growth equation shown in Table 5 but adding either *corruption* or *law* as an additional independent variable. Although we know the *corruption* and *law* variables to be correlated with *distance*, etc., so that there are multicolinearity problems that complicate interpretation, a finding that *corruption* or *law* are significant while variables like *distance* lose their significance in the growth regressions would be suggestive of the possibility that the historical, geographical and social variables affect growth mainly through institutions. The results,

not shown to conserve space, can be summarized by saying that while *distance* and *den1500* are insignificant in all of the growth regressions that include *law* or *corruption*, *statehist* remains significant at the 10% level in the core country sample, with either *law* or *corruption* added,[31] and *ethnic* remains significant in all specifications. *Corruption* and *law* themselves have statistically significant coefficients of the expected sign in every regression and are always more significant than *statehist* or *ethnic*. All of this is suggestive of the more immediate causal importance of the institutional than historical, geographic and social variables.

A second set of tests involves estimating growth equations in which only *corruption* or only *law* appear among the explanatory variables, this time testing whether those two variables should be instrumented by *statehist*, *den1500, distance* or *ethnic*. We performed a simple set of exercises, each involving either *corruption* or *law* and only one of the potential instrumental variables (*statehist*, etc.). For each of these eight combinations of variables and for both the full sample and the core sample (always excluding Bosnia and Serbia), we estimated a first stage regression with dependent variable *corruption* or *law* and independent variables log 1990 GDP per capita, investment ratio, a constant, and the instrumental variable *distance*, *statehist*, *den1500* or *ethnic*. We then used the predicted value of *corruption* or *law* from the first stage regression to estimate a growth regression with dependent variable growth rate of per capita GDP in 1990-2002 and independent variables log initial GDP, investment ratio, predicted *corruption* or *law*, and a constant. For each of the sixteen sets of regressions, we conducted a Wu-Hausman and a Durbin-Wu-Hausman test of endogeneity. To conserve space, we summarize only a few salient features of these tests.

Table 8 reports, for each pair of regressions, the coefficient and *p*-value of *distance*, *statehist*, *den1500* or *ethnic* in the first stage regression, the coefficient and *p*-value of *corruption* or *law* in the second stage regression, and the *p*-value for the Wu-Hausman test of the hypothesis that *corruption*

[31] With *corruption* added to the regression, the *p*-value of the coefficient on statehist is 0.106.

or *law* is exogenous in the growth regression. The signs of the coefficients on the instrumental variables in the first-stage regression are all consistent with the basic thrust of our findings—that is,

	Full Sample				Core Countries			
	statehist	*den1500*	*distance*	*ethnic*	*statehist*	*den1500*	*distance*	*Ethnic*
corruption	-0.00097 0.063*** -6.84 0.019** 0.186	-34209 0.058*** -4.36 0.100*** 0.619	0.00005 0.349 -8.85 0.252 0.282	0.26 0.586 -28.25 0.524 0.004	-0.00114 0.132 -10.66 0.046** 0.106	-23740 0.147 -4.51 0.241 0.993	0.00018 0.067*** -8.074 0.025** 0.255	0.891 0.141 -12.84 0.049** 0.029
law	0.00088 0.063*** 6.23 0.040** 0.243	36206 0.034** 3.68 0.100*** 0.884	-0.00009 0.097*** 4.629 0.111 0.659	-0.710 0.111 9.509 0.044** 0.036	0.00091 0.264 13.33 0.164 0.061	28669 0.099*** 3.74 0.279 0.946	-0.00020 0.048** 7.05 0.037** 0.227	-0.654 0.318 17.49 0.215 0.015

Table 8. Regression coefficients and summary from first and second-stage IV regressions. The variable indicated by the column heading is used as an instrument for the variable indicated by the row heading, which appears in a growth regression for the transition years 1990-2002 (in former U.S.S.R., 1991-2002). All regressions include log of the initial gdp, the average investment ratio and a constant. Numbers shown are, from top to bottom, the coefficient and *p*-value of the instrumental variable (shown in column heading), the coefficient and *p*-value of the instrumented variable (*corruption* or *law*), the number of observations, and the *p*-value of the Wu-Hausman test.

state history and early population density reduce corruption and increase rule of law, while *distance* and ethnic fractionalization increase corruption and decrease rule of law. The individual coefficient estimates in these first-stage regressions are significant at the 5% level in two of sixteen cases, and at the 10% but not the 5% level in another six of sixteen cases.[32] The coefficients on predicted corruption and law in the second-stage regression are also always as expected—more corruption reduces the rate of growth, while more rule of law increases that rate. For these coefficients, the 5% significance level is achieved in seven of sixteen cases and the 10% but not 5% level is reached in another two cases. The Wu-Hausman tests fail to reject exogeneity of *corruption* and *law* at the 5% level except in the four specification that use *ethnic* as an instrument. The 10% level is reached (for corruption, nearly reached) for *statehist* in the core country estimates. Similar results are obtained with the Durbin-Wu-Hausman test.[33]

[32] In another four cases the p-value is between 0.10 and 0.15; thus in twelve of sixteen cases, the coefficients reach or approach the 10% level of significance.

[33] The main difference is that exogeneity is rejected more forcefully by that test in all cases involving *ethnic*, and in the

Since the tests, especially those of endogeneity, should not be given too much weight in view of the small sample size, the short duration of the transition period, problems of measurement (e.g., of growth), and the fact that more complicated specifications have not been considered, it can be said that the results of these exercises are consistent with the idea that history, geography and their social legacy in the form of ethnic fractionalization have had strong influences on the performance of the transition economies, in substantial part by way of their influences on the quality of institutions. The idea that *both* the historical, geographic and social variables *and* institutions have direct impacts on recent performance cannot be ruled out by our findings.

6. Discussion

Our exploration of the effects of two early development indicators—state history and early population density—and of related geographic and social indicators (distance from Berlin, Tokyo or Washington, and ethnic fractionalization, respectively), has produced evidence supporting the proposition that earlier developed societies, which are ethnically more homogeneous and which, in Eurasia, tend to be located closer to the western and eastern ends of the double continent, have enjoyed an advantage in terms of the rate of economic growth both in the socialist and in the transition era. In the pre-transition period, the Eurasian Communist countries, which as a group were generally earlier developers, achieved a more thorough-going version of the socialist (or Soviet) model, yet also grew more rapidly than Third World Marxist states. The richer data that is available for the transition period suggests that the growth advantage conferred by early development worked in large part through its association with superior institutional quality—specifically, less corruption and greater rule of law.

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core country cases when *statehist* is used, the rejection being below the 10% level for both the *corruption* and the *law* models, using that test.

Because earlier developers grew faster in both the Communist and the transition periods, it should be no surprise that growth rates in the two periods are positively correlated with each other. The correlation between the rate of GDP per capita growth during 1970-1990 and that during 1990-2002 is 0.3293, which has a *p*-value of 0.038, for the full sample (40 observations), and 0.4559, with *p*-value 0.011, for the core sample (30 observations). Overall, then, countries that performed better in the (late) socialist period have also done better during transition, and vice versa.[34] This is consistent with the idea that growth differences among countries are partly driven by differences in a *social capacity for growth* that to some degree transcends the particular economic model pursued.

Some readers might wonder whether the apparent effects of early development are not merely coincidental, and whether proximity to Western Europe is not the important factor underlying our results for the Eurasian sample. After all, the better performance of transition countries located closer to Western Europe is obvious to casual observers contrasting once-Communist nations stretching from Central Europe to Central Asia, and some may be tempted to attribute this pattern to the direct and short-term influence of contacts between neighboring countries. Our first response to this argument is that our results for *statehist*, *den1500*, and *ethnic* (which we've shown to be related to those historical variables) are often as significant as are those for *distance.* To investigate the "promity to the West" hypothesis more directly, however, we carried out two sets of tests. First, we re-estimated the growth regressions for the core sample in the Communist (Table 2b) and transition (Table 5) periods, substituting a simpler *distance from Berlin* variable for *distance* (from Berlin or Tokyo). While the coefficient on the new distance variable had the same sign and was also significant, its *t*-statistic was only about half as large, supporting the hypothesis that both ends of the Eurasian continuum play a role in our findings. Second, although the high correlation between

[34] Simple convergence (poorer countries growing faster) might have accounted for the correlation over time of growth rates, but recall that convergence does not hold for our sample during 1970-1990 (see Table 2).

distance and our historical and social variables makes most such results unreliable due to multicolinearity, we investigated whether qualitative results in the growth regressions of those tables hold when *distance* is added to the explanatory variable set in specifications containing *statehist*, *den1500* and *ethnic*. We found that *statehist* continues to have a positive and statistically significant partial correlation coefficient in a growth regression even after controlling for *distance*. For the transition period, *statehist*'s effect is significant at the 5% level in the core sample, while the effect of *distance* is significant only at the 10% level. When *ethnic* and *distance* are entered together, instead, the coefficient on *ethnic* is significant at nearly the 1% level while that on *distance* is entirely insignificant.

To be sure, the social and political trends of more recent centuries seem to be at least as important in their effects on the spheres in question as are the direct influences of the classical civilizations of the Mediterranean and east Asia. This is well illustrated by comparing the progressive characteristics of the Baltic states, influenced by a northern Europe that was "barbaric" in Roman times but had become a bastion of liberal democracy by the 20th Century, to the relative backwardness of the Caucasus and Central Asia, areas close to the once advanced civilizations of the Near East and Persia which have receded from world technological and organizational frontiers beginning in late medieval times. Replacing the *distance from Berlin* component of our distance measure with distance from Helsinki, Berlin, Vienna or Rome, whichever Western capital is closer, did not improve the fit of our distance measure, however.

Moreover, such an historical updating of the simpler approach followed in our paper in no way conflicts with the basic proposition that much of the vast difference in economic performance that separates the different countries and regions of the world today has deep historical roots. That proposition may appear obvious to an observant and historically aware traveler, but it has by and

large been ignored by students of economic growth. Our hope is that by discovering in the once-Communist countries the same influences recently observed for the rest of the world, this paper will contribute further to injecting an historical perspective into the study of contemporary economic growth.

References

Abramovitz, Moses, 1986, "Catching up, forging ahead, and falling behind," *Journal of Economic History,* 46: 385-406.

_____, 1995, "The Elements of Social Capability," pp. 19-47 in Perkins and Koo, eds., *Social Capability and Long-Term Economic Growth*. New York: St. Martin's Press.

Acemoglu, Daron, Simon Johnson and James Robinson, 2002, "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution," *Quarterly Journal of Economics* 117(4): 1231-94.

Adelman, Irma and Cynthia T. Morris, 1967, *Society, Politics and Economic Development*. Baltimore: Johns Hopkins University Press.

Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat and Roman Wacziarg, 2003, "Fractionalization," *Journal of Economic Growth* 8: 155-194.

Barro, Robert, 1991, "Economic Growth in a Cross-Section of Countries," *Quarterly Journal of Economics* 106: 407-44.

Barro, Robert and Xavier Sala-i-Martin, 2004, *Economic Growth, 2nd Edition*. Cambridge: MIT Press.

Bockstette, Valerie, Areendam Chanda and Louis Putterman, 2002, "States and Markets: The Advantage of an Early Start," *Journal of Economic Growth* 7: 347-69, 2002.

Boserup, Ester, 1965, *Conditions of Agricultural Growth: The Economics of Agricultural Change Under Population Pressure*. New York: Aldine.

_____, 1981, *Population and Technology*. Oxford: Basil Blackwell.

Burket, John, Catherine Humblet and Louis Putterman, 1999, "Pre-Industrial and Post-War Economic Development: Is There a Link?" *Economic Development and Cultural Change* 47 (3): 471-95.

Chanda, Areendam and Louis Putterman, 2002, "Economic Growth, Social Capability, and Pre-Industrial Development," unpublished paper, Brown University.

Chanda, Areendam and Louis Putterman, 2004a, "Early Starts, Reversals, and Catching up in the Process of Economic Growth," Working Paper 2004-04, Department of Economics, Brown University.

Chanda, Areendam and Louis Putterman, 2004b, "The Quest for Development: What Role Does History Play?" *World Economics* 5 (2): 1-31.

Chanda, Areendam and Louis Putterman, forthcoming, "State Effectiveness, Economic Growth, and the Age of States," in Matthew Lange and Dietrich Rueschemeyer, eds., *States and Development: Historical Antecedents of Stagnation and Advance.* London: Palgrave/Macmillan.

Clague, Christopher, ed., 1997, *Institutions and economic development: Growth and governance in less-developed and post-socialist countries.* Baltimore: Johns Hopkins University Press.

De Broek, Mark and Vincent Koen, 2000,"The Great Contractions in Russia, the Baltics and the Other Countries of the Former Soviet Union: A View from the Supply Side", IMF working paper 00/32.

Dedek, Oldrich, 1996, *The Break-up of Czechoslovakia: An In-depth Economic Analysis,* Avebury, Ashgate Publishing Company, England.

Diamond, Jared, 1998, *Guns, Germs and Steel: The Fates of Human Societies.* New York: W. W. Norton.

Easterlin, Richard E., 1981, "Why Isn't the Whole World Developed?" *Journal of Economic History*, 41(1):1-19.

Easterly, William and Ross Levine, 1997, "Africa's Growth Tragedy: Policies and Ethnic Divisions," *Quarterly Journal of Economics* 112: 1203-1246.

Galor, Oded and David N. Weil, 2000, "Population, Technology, and Growth: From The Malthusian Regime to the Demographic Transition," *American Economic Review* 90(4): 806-28.

Gallup, John Luke and Jeffrey Sachs with Andrew Mellinger, 1999, "Geography and Economic Growth," pp. 127-178 in Boris Pleskovic and Joseph Stiglitz, eds., *Annual World Bank Conference on Development Economics 1998*. Washington: The World Bank.

Greif, Avner, 1994, "Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies*," Journal of Political Economy* 102: 912-50.

Groningen Growth and Development Centre and The Conference Board, Total Economy Database, August 2004, http://www.ggdc.net

Hall, Robert E. and Jones, Charles I., 1999, "Why Do Some Countries Produce So Much More Output per Worker than Others?" *The Quarterly Journal of Economics* 114: 83-116.

Hibbs, Douglas and Ola Olsson, 2004, "Geography, Biogeography and Why Some Countries are Rich and Others Poor," *Proceedings of the National Academy of Sciences* 101 (10): 3715-20.

Inkeles, A. and D. H. Smith, 1974, *Becoming Modern*. London: Heinemann.

Johnson, Allen and Timothy Earle, 1987*, The Evolution of Human Societies: From Foraging Groups to Agrarian State*. Stanford, CA: Stanford University Press.

Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobatón, 2000, "Governance Matters: From Measurement to Action," *Finance and Development* 37 (2): 10-13.

Knack and Keefer, 1997, "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation," Quarterly Journal of Economics 112 (4): 1251-88.

Landes, David, 1998, *The Wealth and Poverty of Nations*, New York: W.W. Norton.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny, 1997, "Legal Determinants of External Finance," *Journal of Finance* 70 (3): 1131-50.

Lenski, Gerhard and Patrick Nolan, 1984, "Trajectories of Development: A Test of Ecological-Evolutionary Theory," *Social Forces* 63 (1): 1-23.

Lenski, Gerhard and Patrick Nolan, 1999, *Human Societies, 8th Edition*. New York: McGraw Hill.

Levine, Ross and David Renelt, 1992, "A Sensitivity Analysis of Cross-Country Growth Regressions," *American Economic Review* 82: 942-63.

Mankiw, Gregory N., David Romer and David N. Weil, 1992, "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics*, 107(2): 407-437.

McEvedy, Colin and Richard Jones, 1978, *Atlas of World Population history.* New York: Facts on File.

Nelson, Richard and Bhaven Sampat, 2001, "Making Sense of Institutions as a Factor Shaping Economic Performance," *Journal of Economic Behavior and Organization* 44: 31-54.

Perkins, Dwight H. and Bon Ho Koo, 1995, "Introduction," in Koo and Perkins, eds., *Social Capability and Long-Term Economic Growth*. New York: St. Martin's Press.

Plestina, Dijana, 1992,*Regional Development in Communist Yugoslavia: Success, Failure, and Consequences*, Boulder : Westview Press

Pryor, Frederick, 2004, *Economic Systems of Foraging, Agricultural, and Industrial Societies.* New York: Cambridge University Press..

Putterman, Louis, 2004, "State Antiquity Index (Version 3)," available on line at http://www.econ.brown.edu/fac/Louis%5FPutterman/.

_____, 2000, "Can an Evolutionary Approach to Development Predict Post-War Economic Growth?" *Journal of Development Studies* 36(3): 1-30.

_____, 1995b, "Social Capital and Development Capacity: The Example of Rural Tanzania," *Development Policy Review* 13: 5-22, 1995.

Sabow, Lee, 2001, "Economic Consequences of Ethnic Heterogeneity in Eastern and Central Europe," Senior Thesis, Department of Economics, Brown University.

Sachs, Jeffrey and Andrew Warner, 1997, "Sources of Slow Growth in African Economies," *Journal of African Economies* 6 (3): 335-76.

Sahlins, Marshall, 1972, *Stone Age Economics*. Chicago: Aldine-Atherton.

Sala-i-Martin, Xavier, 1997, "I Just Ran Two Million Regressions," *American Economic Review* 87 (2): 178-83.

Sanders, William and Joseph Marino, 1970, *New World Prehistory: The Archeology of the American Indian*. Englewood Cliffs, NJ: Prentice-Hall.

Scherer, John L., ed., 1984, *U.S.S.R. Facts and Figures Annual, vol. 8*. Gulf Breeze, FL: Academic International Press.

Service, Elman, 1971, *Cultural Evolutionism: Theory in Practice*. New York: Holt, Rinehart and Winston.

Shifferd, Patricia, 1987, "Aztecs and Africans: Political Processes in Twenty-two Early States," in H. J. M Claessen and P. van de Velde, eds., *Early State Dynamics*. Leiden: E.J. Brill.

Smith, Adam, 1985 [1776]. *An Inquiry into the Nature and Causes of The Wealth of Nations*. New York: Modern Library.

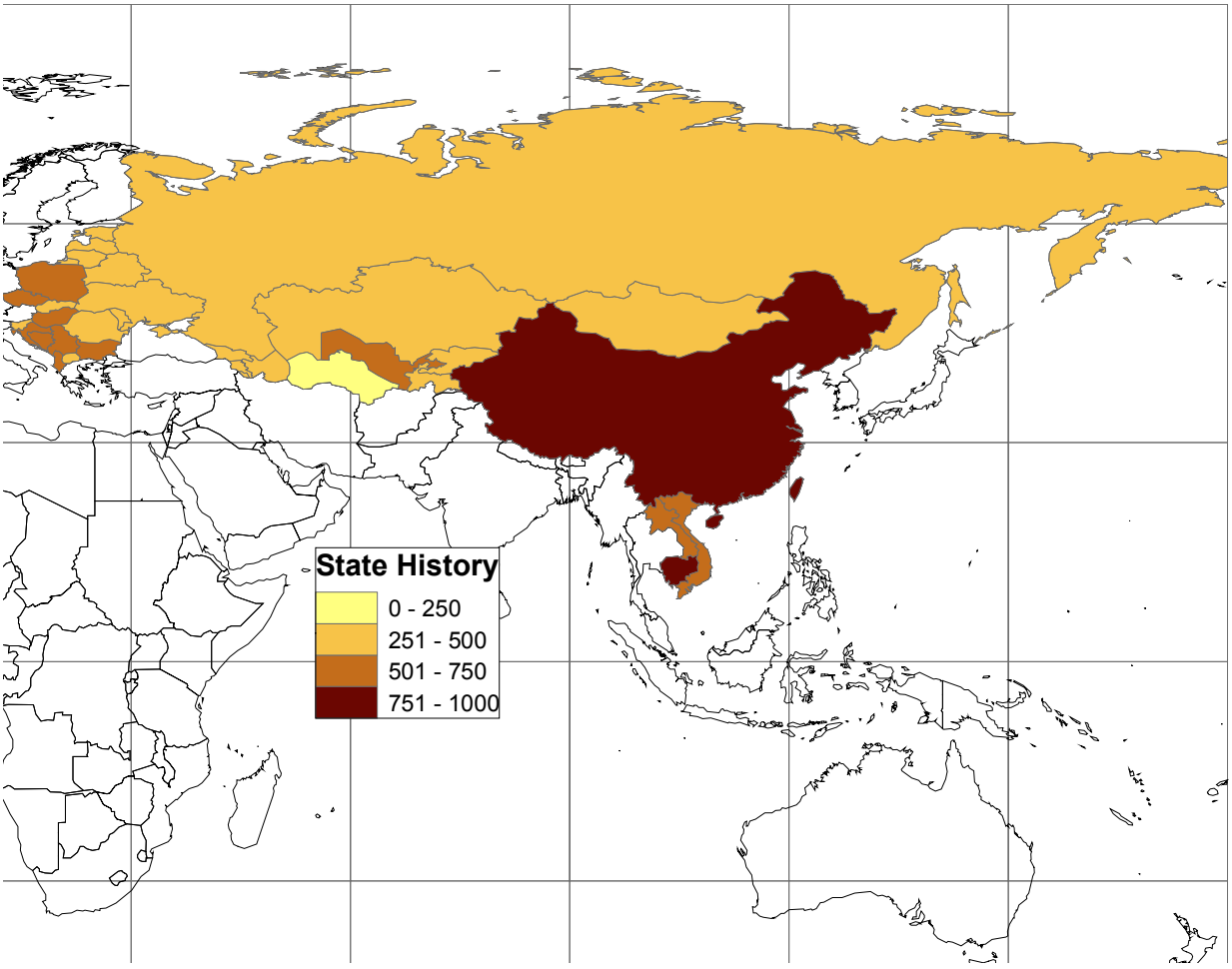
Solow, Robert, 1956, "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics* 70: 65-94.

Temple, Jonathan, 1998, "Initial Conditions, Social Capital and Growth in Africa," *Journal of African Economies*, **7**(3): 309-347.

Temple, Jonathan and Paul A. Johnson, 1998, "Social Capability and Economic Growth," *Quarterly Journal of Economics*, 113(3): 965-990.

Weil, David, 2004, *Economic Growth*. Boston: Addison-Wesley.

Map showing state history index values for core Eurasian Communist and transition countries using current country boundaries. (Other countries unshaded.)



Appendix Table.

Country	State and Collective Sector Share of Employment	GDP p.c. Growth rate Under socialism	Average GDP p.c. Ratio in Transition	State History index	Population Density 1500	Ethnic Heterogeneity index	Distance from Berlin, Tokyo or Washington	Rule of Law	Corruption
Eastern Europe									
Albania	49.80	0.81	1.02	511.04	6.96	0.22	1335.09	-0.7062	0.6028
Bulgaria	98.60	1.13	0.88	582.38	7.21	0.40	1318.60	0.0150	0.1562
Czech Rep. Republic		1.64	0.97	537.22	24.86	0.32	281.25	0.6390	-0.3056
East Germany	95.00	2.19		693.39	15.29		0.00		
Hungary	89.70	1.44	0.98	529.12	13.54	0.15	689.85	0.7614	-0.6531
Poland	73.60	0.52	1.20	529.43	13.14	0.12	514.97	0.5506	-0.4329
Romania	93.10	1.07	0.88	412.55	8.68	0.31	1293.76	-0.0223	0.5114
Slovakia		0.91	0.92	357.50	21.22	0.25	553.08	0.3625	-0.2260
Former Yugoslavia									
Bosnia and Herzegovina		2.19	3.16	509.09	5.87		1031.16		
Croatia		2.02	0.83	531.32	6.37	0.37	770.68	0.2864	-0.0210
Macedonia		3.04	0.88	434.17	6.84	0.50	1317.14	-0.3347	0.5072
Serbia and Montenegro		2.44	1.11	581.55	8.32		999.98	-0.9401	1.0378
Slovenia		2.72	1.23	450.96	7.94	0.22	724.80	0.8904	-1.0875
Former Soviet Union									
Armenia		1.83	0.75	478.49	4.36	0.13	2719.82	-0.3517	0.7956
Azerbaijan		1.45	0.65	418.95	3.12	0.20	3058.82	-0.7760	1.0512
Belarus		1.92	0.83	365.82	3.47	0.32	952.02	-0.8130	0.0567
Estonia		1.08	0.94	258.85	2.22	0.51	1037.29	0.7777	-0.7281
Georgia		1.22	0.46	493.97	2.87	0.49	2632.39	-0.4323	0.6897
Kazakhstan		0.66	0.83	354.12	0.34	0.62	3880.47	-0.5954	0.8314
Kyrgizstan		1.50	0.65	263.34	1.62	0.68	4563.36	-0.7178	0.8450
Latvia		1.22	0.71	287.13	2.79	0.59	793.88	0.3612	0.0337
Lithuania		1.41	0.74	406.62	3.98	0.32	818.95	0.2870	-0.1962
Moldova		1.31	0.50	336.56	8.99	0.55	1262.20	-0.4165	0.8251
Russia		1.03	0.71	407.53	0.40	0.25	1611.59	-0.8694	1.0135
Tajikistan		1.22	0.42	464.67	2.80	0.51	4453.89	-1.2548	1.0762
Turkmenistan		1.08	0.66	234.16	0.61	0.39	3795.63	-1.0215	1.1209
Ukraine		0.98	0.57	342.75	6.03	0.47	1217.12	-0.6258	0.8974
Uzbekistan		1.73	0.81	684.07	3.71	0.41	4299.63	-0.7131	0.6611
Asian Communist									
Cambodia		2.27	1.23	752.88	8.29	0.21	4409.85	-0.3823	-0.3354
China	71.10	5.02	1.87	822.70	11.51	0.15	2094.73	-0.1949	0.3045
Korea, North	100.00				8.30		1296.09	-0.7428	0.8967
Laos		1.10	1.27	575.18	1.73	0.51	4141.07	-0.7212	0.3052

Mongolia	63.10	3.19	0.84	464.96	0.39	0.37	3013.25	0.4158	0.1928
Vietnam	64.10	1.49	1.48	604.96	6.15	0.24	3666.65	-0.5682	0.7627
Other Marxist States									
Angola	9.00	-1.45	0.79	271.16	0.78	0.79	6815.38	-1.4876	1.1433
Benin	3.50	1.55	1.12	171.16	2.75	0.79	5211.08	-0.5698	
Cape Verde	51.20	6.78	1.20	198.83	0.00	0.42	5290.53	0.1498	
Congo, Republic of	14.70	1.57	0.88	230.95	0.99	0.87	6314.07	-1.1126	0.4906
Ethiopia		-0.07	1.01	860.98	1.79	0.72	5344.93	-0.2395	0.3999
Guinea Bissau	13.40	-1.02	0.94		2.14	0.81	5207.98	-1.5039	-0.1049
Madagascar	5.30	-2.64	0.87	267.37	1.20	0.88	8593.86	-0.6809	0.9277
Mozambique	13.40	-1.93	1.21	206.78	1.28	0.69	8919.30	-0.3202	-0.1049
São Tomé and Principe	74.50	-1.09	0.95	193.03	0.00		5852.98		
Seychelles	58.20	1.49	1.19	90.49	0.00	0.20	7476.16		
Somalia	7.00	2.31		687.60	1.28	0.81	6338.09	-1.2850	1.1566
Zimbabwe	25.50	2.61	0.96	72.62	0.88	0.39	8011.48	-0.9411	1.0806
Afganistan	15.90	-0.88		552.36	3.07	0.77	4775.89	-2.1657	1.4660
Cuba	94.20	2.22		198.41	0.45	0.59	1815.68	-0.3198	0.1229
Grenada	31.90		1.14	133.24	0.00	0.27	3332.97		
Guyana	25.60		1.42	151.89	0.30	0.62	4027.02	0.1288	0.4527
Nicaragua	23.80	-3.82	1.00	209.27	0.91	0.48	3108.06	-0.7888	0.7955