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Myths and Realities of Long-run Development: A Look at Deeper Determinants

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It has long been realised that factor accumulation and technological development are only proximate causes of economic development, and the focus has now shifted to investigating the 'deeper determinants' of economic growth. Two such forces are highlighted in the literature: institutions and geography. However, it remains controversial as to which of these two is the more important. The "institutions school" assigns primal importance to institutions, whereas the "geography school" considers geographical factors as the primary determinant of the economic performance of countries. This paper reviews the debate surrounding these "deeper determinants" of economic performance. It reviews the work of these two schools of thought and their interpretation of the long-run development. The paper then examines the evidence provided by the respective schools in favour of their hypotheses. It concludes in favour of the Institutions hypothesis as the Geography school does not provide a consistent story of long-run development.

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1. INTRODUCTION

The world income is very unevenly distributed across countries. While the average annual income of one billion people living in high-income economies is about $27000, that of 2.5 billion people living in low-income economies is a mere $430 [World Bank (2004)]. What explains these phenomenal differences in economic performance?

Until recently, economists had conveniently attributed it to the process of capital accumulation and technological development, in line with the predictions of neoclassical growth theory. However, the theory was unable to provide an explanation for some basic question as to why some countries *accumulate* more capital and innovate faster than others. As North and Thomas (1973) write, "if all that is required for economic growth is investment and innovation, why have some societies missed this desirable outcome?"

So, now capital accumulation and productivity growth are considered as "proximate" causes only, and the focus has shifted to investigating "deeper determinants" of growth.[1] What are these "deeper determinants"? Literature highlights *geography* and *institutions* as two such candidates. However, there is no consensus about which one of

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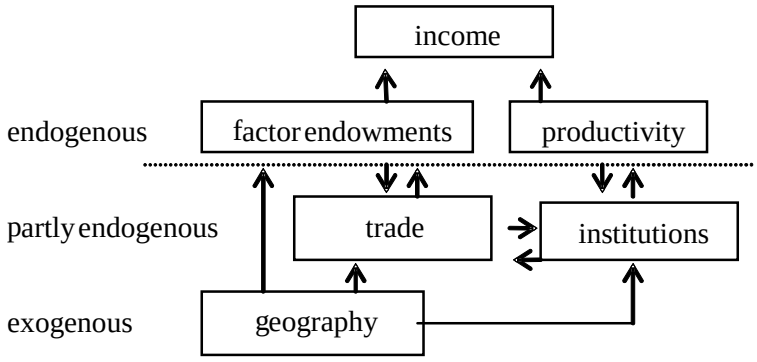
[1]See Rodrik, *et al.* (2004) and Easterly and Levine (2003). Also see, Bloch and Tang (2004), Przeworski (2004), and Woods (2004) for a review of some of the issues. Also see Kibritcioglu and Dibooglu (2001) and Snowdon (2006) for an interesting discussion of Long-run growth.

these is more important. The "institutions school" argues for institutions as the fundamental cause, while the "geography school" considers geography as the primary determinant. Consequently, a debate has ensued which remains inconclusive till today. Figure 1 below describes the analytical framework within which much of this discourse takes place. Factors endowments and productivity are treated as the proximate causes of growth, which in turn are determined by the institutions and geography.

Fig. 1. The Deeper Determinants of Growth—Analytical Framework



Source: Rodrik (2003).

This paper reviews the debate about deeper determinants of growth. The structure of paper is as follows. The next two sections review the two schools of thought with focus on main theoretical contributions within each school, their explanation of the long-run development, and empirical evidence provided in support of their hypotheses. Section two reviews the geography school and the third section discusses the institutions school. The fourth section is devoted to the debate and the final section concludes.

2. GEOGRAPHY AS DESTINY

The geography school of thought has a long pedigree and dates as long back as Aristotle,[2] but it is Montesquieu (1752) who is credited for presenting the first systematic theory linking geography with development of human society in his classical treatise *The Spirit of Laws* [Olsson (2005)]. The focus of early writers of this school of thought [Montesquieu (1752); Huntington (1915) and GilFillan (1920)] [3] was primarily on climate and its impact on human effort, though water was also discussed. This genre, however, went into oblivion following World War II but resurfaced again only recently. Owing to its discontinuity, we divide this school into the classical thought and the more contemporary work.

[2]Aristotle is known for introducing the concept of "Meteorolgica", i.e., a zone of habitable world (latitudinally-oriented**)**. Based on his observations, he conjectured that the most hospitable zones were the mid-latitude regions [Juergensen and Coyne (n.d.)].

[3]This list is by no means exhaustive; it rather represents the most influential works as noted by the research community [see Olsson (2005) on this point].

2.1. The Classical Thought on Geography and Development

The early theorists asserted that climate has a direst bearing on the temperaments and customs of a country's inhabitants. Montesquieu (1752) argued that people of colder climates are vigorous, courageous, phlegmatic, disciplined, and more determined than people of hotter climates. People of hotter climates are more fearful and susceptible to temptations, less resolute and less capable of decisive action.[4]

Huntington in "Civilisation and Climate" contended that mental and physical vigour were related to outside temperature. The right combination of temperature and humidity lends energy to people,[5] which then enables them to be more honest, self-controlled, and willing to take initiatives. The tropical climate, on the other hand, weakens character through inducing a proneness to indulgence, inertia, and weakness of will [see Whitebeck (1916)].

In similar vein, GilFillan (1920) explained the "Coldward Course of Progress" away from early centre of civilisations in Sumer and Egypt in the third millennium B.C (average temperature 74˚F), to Berlin (48˚F) in early twentieth century primarily based on climate. He reasoned that early civilisations appeared in hot climates because agriculture is easy to appear in warm regions, but later, as technology assumed a more important role, leadership moved northwards where conditions for mental ability were better [GilFillan (1920)].

In an interesting line of work linking water with development, Wittfogel (1957) developed the thesis, more popularly known as *Oriental Despotism*, that hydraulic civilisations" (i.e. civilisations dependent on large scale irrigation networks) are more prone to be under some kind of despotic rule. He reasoned that large scale irrigation networks implied specialisation and division of labour (for digging, dredging, tool making, etc.), an organisational hierarchy for coordinating and directing the activities of mass labour, and government control over distribution of water (to ensure proper distribution). This led to the development of impersonal governments (as against a tribal form of government) with control and monopolisation of political power, taking the shape of absolutist states.[6]

This strand of thought reached its zenith in the early decades of the twentieth century when it had considerable influence on the scientific community and civil society, especially in the developed parts of the world. Later, however, it fell into disrepute as "modern sensibilities" refused to accept its racial undertones.[7] Landes (1999) writes that geography had lost ground when, after World War II, Harvard University abolished its geography department, and many other universities followed suit. Criticism abound, these classical

[4]Bok, Hilary, "Baron de Montesquieu, Charles-Louis de Secondat", *The Stanford Encyclopedia of Philosophy* (Fall 2003 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2003/entries/montesquieu/>.

[5]Results of field experiments indicated that an average temperature of 65 degree Fahrenheit was optimum for physical work, and average temperature of 38 degree Fahrenheit maximised mental activity [Whitebeck (1916)].

[6]Wittfogel includes Egypt, Mesopotamia, India, China, and pre-Colombian Mexico and Peru in this list. http://www.riseofthewest.net/thinkers/wittfogel05.htm (adapted from on-line *Encyclopedia Britannica*'s articles).

[7]Primarily, this school attributed the *superior* culture of Western Europe (and its offshoots) to its colder climate.

theories now constitute a disbanded line of research.[8] Though, they continue to influence contemporary ideas in this area even today [Stehr and Storch (1998)].

2.2. The Contemporary Thinking on Geography

Of late, geography is enjoying a kind of renaissance, and a huge effort has been launched by contemporary writers on geography [Krugman (1995); Diamond (1999); Landes (1999) and Sachs, *et al.* (Various publications)] to place it back into its lost position. This re-launch effort was based on the realisation that the early writers went 'too far' [Landes (1999)].

Landes (1999) own effort explains *The Wealth and Poverty of the Nations* cast in terms of geographic endowments i.e. climate**,** disease and water. He writes that hot climate of the tropics not only implied adaptation of work habits to keep people inactive during midday (like siesta) but also had negative implications for the disease environment as year round heat meant proliferation of pest hostile to men. Water supply is also problematic because rainfall, though enough on average, is irregular and unpredictable and downpours are extremely harsh, so "cultivation does not compete easily with jungle" [Landes (1999), p. 13)]. Storage of water for irrigation purposes is difficult on account of very high rates of evaporation. In contrast, Europe had (and still has) access to a heavy and reliable rain water, which meant that individual farmers were not reliant on a ruling élite managing the irrigation network. The fragmented nature of European continent implied intense competition among many small states with favourable consequences for trade, institutional development and individual freedom. European domination of the world was, eventually, helped by its unique topography [Landes (1999)].

An additional feature of European topography that has received scholarly attention is its unique position in term of access to the Atlantic Ocean. Oceanic currents made it easy for Europeans to reach the Americas, which had abundant supplies of natural resources including precious metals.[9]

Another line of research that links natural resource endowments (e.g. oil, minerals, and diamonds etc.) of a country with its growth potential is the 'Resource Curse' hypothesis. It draws its name from the empirical observation that resource rich countries (Latin America and some African countries) have experienced slower growth compared to resource poor countries (East Asian NICs). Many explanations are offered for this empirical regularity. One is the *Dutch Disease Phenomenon*. It typically refers to a situation where discovery of a primary natural resource appreciates the value of currency for that country and diverts investment away from manufacturing and service sectors and hence lowers growth rate.[10] Others have stressed the political economy

[8]Climate theories were discredited for their racial undertones and lack of supportive evidence. Wittfogel's thesis of Hydraulic Civilisations fits the ancient Chinese empire but is less valid for India, which was unified only under the British rule. Moreover, Europe, despite its fragmented nature, was united under the Roman Empire for many centuries.

[9]See Acemoglu, Johnson and Robinson (2005b) for empirical verification of this point. Their theory, however, stresses that the effect of access to the Atlantic on incomes works through institutions.

[10] See De Silva (1994), Gylfason (2001a, 2001c), Gylfason, *et al.* (1999), Matsen and Torvik (2003), Mckinley (2005), Nakahodo and Jank (2006).

consequences of rich resource base. They argue that natural resource abundance increases corruption and rent seeking activities and reduces incentives for productive activities.[11]

Though a number of researchers have worked on re-invoking interest in geography as a possible explanatory factor behind different evolutionary pattern of regions overtime, but it is due to the work of Jeffery Sachs and his colleagues [Sachs (2003, 2001); Gallup, Sachs, and Mellinger (1999); Radelet and Sachs (1998) and Gallup (1998)] that geography is finding its way back into theoretical and empirical studies of economic growth. In a series of papers these authors have tried to show that various measures of prosperity (per capita income, growth rates) are strongly correlated with geographical and ecological measures (climate zones, disease ecology, distance from coast etc.) [Sachs (2003)].[12] They assert that tropical regions are hindered in their development on account of low agriculture productivity, high disease burden, and high transport costs.[13] Sachs (2001) proposes five hypotheses regarding tropical underdevelopment. He summarises his assertions as: (1) technologies in critical areas of health, agriculture, construction, energy use, and other manufacturing processes are specific to ecological zones; (2) by the start of modern era temperate zone technologies were more productive than tropical zone technologies; (3) technological development is an increasing returns to scale activity;[14] (4) social change processes (especially urbanisation and demographic transition) amplified this gap; (5) geopolitical factors (European imperialism, control of international financial institutions by rich nations of the world) widened this divide even further [Sachs (2001)].

Gallup (1998) shows that agriculture productivity is sensitive to ecological conditions (climate, water availability, and soil fertility). His empirical findings suggest that, compared to the temperate zones, agriculture productivity is 30–35 percent lower in the tropics. Gallup and Sachs (2001) document evidence of geography affecting the economic performance of countries through higher disease burden. They show that countries with intensive malaria had 33 percent lower incomes than countries without malaria. Radelet and Sachs (1998) estimate that landlocked country, where shipping cost are magnitude of a degree higher than similar coastal economy, experiences slower growth.[15] Their argument will be taken up again in Section (4) where we discuss the debate.

2.3. Geography and Long-run Development

One of the most influential and controversial work, in recent times, on geography and economic development over the long run is that of Diamond (1999).

[11]Auty (2004), Bulte, Damania, and Deacon (2005), Deacon and Mueller (2004), Eifert, Gelb, and Tallroth (2002), Gylfason and Zoega (2001), Gylfason (2001b), Olsson (2003), Pritchett, Woolcock, Busby, and Isham (2004), Ross (2001,1999), Sachs and Warner (2001).

[12]Also see Escobal and Torero (2000) for an exposition of the link between geography and growth in the context of Peru.

[13]High transport costs are due to (1) limited access to sea and ocean navigable rivers (a high percentage of population living in hinterlands, higher number of landlocked economies), and (2) greater distance from major economic centres of the world.

[14]He considers this to be the main amplifier of gap between temperate zone and tropical zone economies.

[15]A 10 percent increase in distance from the sea is associated with 1.3 percent increase in shipping costs. An increase of 50 percent in shipping costs reduces growth rates by 0.3 percent per annum [Radelet and Sachs (1998)].

The question that he seeks to address through his work *Guns, Germs and Steel: The Fates of Human Societies* is, why did Europe colonise America (and other parts of the world) and not the other way round?[16] He asserts that Europe had superior technology and political organisation compared to any other region around 1500 A.D.—the time when epoch of colonisation began to take place. He attributes this to different rates of development on different continents from 11,000 B.C.[17] to A.D. 1500. The essence of his thesis is as follows: Eurasia[18] (owing to its large size and Mediterranean climate) was naturally endowed with the highest number of animal and plant species that could be domesticated (see Table 1 below).

Table 1

Distribution of Species Suitable for Domestication

Area	Number of Plants	Number of Animals
Near East, Europe, North Africa	33	9
East Asia	6	7
Southeast Asia	6	2
Sub-Saharan Africa	4	0
North America	4	0
Central America	5	0
South America	2	1
Australia	2	0

Source: Olsson and Hibbs (2005).

Domestication of plants and animals had far reaching consequences for the Eurasian region. Use of animals in agriculture meant that the farmer could till larger tracts of land than he could do so with his own effort alone. Domestication of plants meant more calories per acre compared to wild habitat where most species are inedible. So, areas with rich biogeographic potential made an early transition to settled agriculture (Table 2 below).

Table 2

Independent Origins of Sedentary Agriculture

Area	Date	Domesticated Plants	Domesticated Animals
Near East	8500 B.C.	wheat, barley pea	goats, sheep
China	7500 B.C.	Rice, millet	pig
Central Mexico	3500 B.C.	Corn, beans	turkey
South Central Andes	3500 B.C.	Potato, manioc	llama, guinea pig
Eastern United States	2500 B.C.	sunflower	None
Sub-Saharan Africa	4000 B.C.	sorghum	None

Adapted from Olsson and Hibbs (2005).

[16]Typically he asked why a few hundred Spaniards under CortŽs and Pizarro overthrew the Aztec and Inca Empires? Why Emperors Montezuma or Atahuallpa did not lead the Aztecs or Incas to conquer Europe?

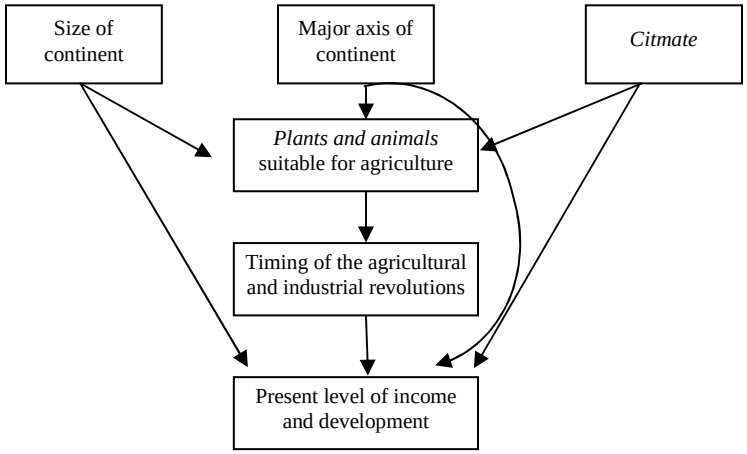
[17]Diamond (1999) asserts that 11,000 B.C. is a suitable starting point from which to compare historical developments on the different continents, because this date corresponds to the end of the Pleistocene Era and last Ice age (start of the recent era in geological terms). This date also corresponds to the beginning of the village life in some parts of the world. Domestication of plants and animals started within a few thousand years of this date [Diamond (1999), p. 35].

[18]Includes Europe, parts of Asia, near East, and the Fertile Crescent.

Dense population settlements began to emerge. Food surpluses generated in agriculture led to increased specialisation of the work force and emergence of "stratified and politically centralised societies" with ruling élites. These developments were accompanied by technological advancement as craftspeople (those who were not engaged in agriculture) devoted themselves to science of metallurgy, and writing etc. The end result was that Eurasia had advantage in guns (and germs), swords, oceangoing technology (Large ships, maps and other navigation tools) as well as political organisation, all of which were products of large, dense, sedentary, stratified societies made possible by agriculture. This early advantage allowed Eurasia to colonise the Americas and Africa [Diamond (1999)].

Olsson and Hibbs (2005), in an interesting and innovative work, encapsulate the essence of Diamond's theory and subject it to empirical verification. They test the hypothesis that the initial biogeographic conditions[19] determined the timing of transition to sedentary agriculture. The resultant (accelerated) technological progress[20] yielded regional development advantages that to some degree affect present day per capita incomes. The following figure (Figure 2) describes the sequencing of their logic.

Fig. 2. Biogeography and Long-run Economic Development



Source: Olsson and Hibbs (2005).

While Diamond (1999) did not make an effort to link biogeographic potential with the present level of well-being, Hibbs and Olsson (2004) fills this gap. They develop a framework that provides a link between initial biogeographic endowment and present day incomes, and explains economic development over three major stages of history; the hunter-gatherer stage, the agriculture stage, and the industrial stage, based on following 'stylised facts' (1) agriculture first emerged in areas with rich biogeographic potential, (2) there were no 'inherent differences in ability' of hunter-gatherers to exploit their natural environment, (3) agriculture development

[19]I.e., bio-geographical conditions 12,000 years ago, before the onset of settled agriculture.
[20]See Diamond (1999) for this argument.

lead to emergence of a class of people[21] who did not have to get involved in food production and lived on food surpluses generated by the agriculture sector, (4) the emergence of non-food sector set off a process of endogenous knowledge creation and population expansion, (5) living standards did not increase much before the industrial revolution. Results of the empirical exercise validate their hypothesis. In addition, it provides evidence that *initial biogeographic potential has direct effect on incomes even today.*

We conclude our discussion of the geography school here and turn to the institutions school.

3. INSTITUTIONS—THE FUNDAMENTAL DETERMINANT

The idea that institutions matter for economic outcomes had long been realised in the writings of Adam Smith (1776), but it is North (1990) who is recognised for outlining a theory of institutions and incorporating them in mainstream economics.[22] The basic idea that this school of thought propagates is that "institutions matter".[23] Markets, which are the hallmark of the Western capitalist system and are responsible for the unprecedented expansion of economic activities, do not exist in vacuum. They are supported by a complex web of institutional infrastructure [Grief (2005)]. Even a simple exchange, e.g. purchase of oranges in public market, is "complex in terms of its fundamental characteristics…Underlying the transaction-making it possible-[i]s a complex structure of law and its enforcement" [North (1981), p. 35].[24]

3.1. Institutions and Economic Performance

The essence of this school of thought is that Institutions, defined as the *humanly devised constraints* that shape and guide human interactions, facilitate exchange [North (1990:3)]. They allow societies to capture gains from trade and enhance the size of the market by coordinating human activity.

The neoclassical theory of exchange envisions a frictionless economy where (1) markets are competitive, (2) property rights are perfectly defined and costlessly enforced, (3) information is perfect and parties to exchange have mental abilities to process this information, (4) governments are neutral, and (5) tastes are unchanging [North (1978), p. 964]. In short, it assumes a situation where transaction costs[25] are zero. The fundamental problem with this theory, according to North, is that it misconstrues the nature of human coordination and cooperation.

[21]Chiefs, craftsmen, and bureaucrats.

[22]North's earlier work [North (1973, 1981)] was also an effort to highlight importance of institutions, but the theory was finalised in his work, "Institutions, Institutional Change and Economic Performance" (1990). Also see Eggertsson (1990) for how economic behaviour is influenced by institutions.

[23]See Harriss, Hunter, and Lewis (1995), Nabli and Nugent (1989), Aron (2000), Jütting (2003), and Bennedsen, Malchow-Møller, and Vinten (2005) for review of the institutions school.

[24]Implying that the property rights of buyers and sellers are recognised and enforced by a system of law.

[25]Transaction costs are costs of defining, protecting and enforcing property rights [Barzel (1989)] and contracts.

A real life situation poses many problems that make coordination difficult. First, information is not complete and is mostly asymmetric.[26] Even if complete information was available, individuals have limited mental capacity to process, organise and utilise information—bounded rationality.[27] This bounded rationality combined with uncertainty in deciphering the environment means that outcomes are uncertain under impersonal exchange. Moreover, transaction costs, defined as the cost of measurement[28] and the cost of enforcement,[29] are positive. North (1990) argues that "these measurement and enforcement costs are the sources of social, political and economic institutions" [North (1990), p. 27]. Together these constitute the building blocks of his theory. Given these, institutions are needed for an exchange to take place and as such, they affect the performance of the economy by their effect on the cost of exchange.[30] North and Thomas (1973) write, "economic growth will occur if property rights make it worthwhile to undertake socially productive activity" [North and Thomas (1973), p. 8].

3.2. Institutional Account of Long-run Development

What explains unprecedented increases in the fortunes of the Western World over the last couple of centuries? Douglas North, in a long span of both collaborative and individual research [North (1973, 1981, 1990)], explains the economic rise of the Western World in terms of the evolution of its institutions from inefficient to efficient ones. In discussing the contours of European society between 1100 and 1800, North and Thomas (1970) write that productivity increases during this time period can only be explained by a theory of institutional change [North and Thomas (1970), p. 4]. Europe's recent economic successes are attributed to the industrial revolution. They argue that significant changes had occurred in the European society before this epoch that allowed it to take advantage of such an opportunity—break down of feudal culture that created space for establishing private property rights,[31]

[26]One party holds more information than the other.

[27]This concept owes its origin to Simon (1957, 1955). While traditional economic theory assumes that a rational economic man has complete information and computational skills to analyse this information while making a decision, Simon (1955) holds that neither is true. In reality, information is not complete, and the individual has limited mental capacity to analyse available information. He terms this concept as 'bounded rationality'.

[28]The measurement costs are the cost of measuring the valuable attributes of what is being exchanged. Commodities, services and performance of individuals have many attributes and their level vary from one specimen to another. The measurement of these levels is too costly to be comprehensive or fully accurate. The information cost in ascertaining the level of attributes yields measurement costs.

[29]The enforcement costs are the cost of protecting rights and policing and enforcing agreements. These arise from incomplete information. Because we do not know the attributes of a good or service or all characteristics of the performance of an agent we have to devote costly resources to try to measure and monitor performance.

[30]Also see Runge (1984) for this point. Basically, he argues that institutions "increase the value of a stream of benefits associated with economic activity by coordinating behaviour" [Runge (1984), p. 807].

[31]The famine of 1315-17, and the Black Death[31] of 1347-51 caused a decline in the population of Europe which implied significant changes in the relative product values. Marginal lands went out of production. Land rents declined for the landlords and real wages of labour increased. Bonds of manorialism became weak as land leases were lengthened, and the tenants began to acquire exclusive rights over land. So, by the time population began to rise again in the last half of fifteenth century, the structure of feudal society and lord-serf relations had changed.

expansion of trade,[32] and institutional innovations that solved problem of exchange and allowed market to expand were the starting points. From there onwards, it were individuals and organisations in pursuit of profits that capitalised on these early institutional innovations.

Commercial revolution is considered as the most important economic epoch after the Neolithic transformation. Greif, Milgrom, and Weingast (1994) write that the "European economic growth between the tenth and fourteenth centuries was facilitated by the commercial revolution of the Middle Ages" [Greif, Milgrom, and Weingast (1994), p. 746]. This commercial revolution was made possible by the development of institutions that took care of many contractual problems associated with long distance trade [Greif (1989, 1993, 2003)]. Long distance trade, owing to geographic separation of trading parties, is specified by the separation of quid and quo.[33] This posed a commitment problem. "The separation of the quid and the quo created the possibility that one party, however well-intentioned *ex-ante*, would find it to his advantage *ex-post* to reopen the bargaining or simply welsh on the deal" [Dam (2006), p. 3].[34] Second was the agency problem. Traders used to send their cargo to distant markets through agents. One difficulty was to ensure that the agent did not deceive the principal. This had serious implications for the size of the market since such threats would induce many individuals not to take part in the market activities. Since impersonal exchange, characterised by the separation of quid and quo, was a common feature in late medieval Europe, and no state had developed the legal system to enforce contracts in distant places, institutions had to be created to mitigate the contractual problems by countering possibilities of *ex-post* opportunism, i.e., to make parties commit *ex-ante* that they would not breach the contractual obligation *ex-post*.

The community responsibility system was one such response [Greif (2003)]. Much of the trade in Europe was conducted in the context of local communities. These were self-governing units and membership of community was not easily acquired.[35] Under community responsibility system (CRS), every member of the community was liable for the other member's default in inter-community exchange. The strategy for controlling opportunistic behaviour, depending upon situation, varied from property confiscation, to cessation of trade for a finite period of time (in cases of disagreement that a violation has occurred).[36]Another solution to contractual problems in long distance trade involved merchant guilds. Famous among these are the German Hansa and Maghribi traders. These guilds operated on the principles of multilateral reputation. German Hansa governed relationships among German merchants and foreign towns in their trading relations. It used threat of embargo as retaliation

[32]Interregional trade was possible because spread of population into new territories opened up areas with different resource endowments. Wine trade expanded because viticulture was possible in many new areas and fine wine was in demand. Wool trade, particularly of woolen cloth, also expanded. An additional factor contributing to expansion of trade was the influx of treasures from the New World, as it contributed to increased size of the market and provided impetus for trade.

[33]This is in sharp contrast to public market or 'bazaar', where quid and quo are exchanged simultaneously [Dam (2006)].

[34]The problem was compounded by the issues of jurisdiction. City states could enforce contracts within their territories but could not enforce agreements when the other contracting party was in distant city.

[35]In Venice, e.g., one had to pay taxes for twenty five years to be eligible for membership.

[36]In Florence, for example, thirty six cases of disputes, confiscation and cessation of trade were reported [cited in Greif (2003)].

against defection [Greif (1994)].[37] Maghribi traders is yet another example of institutional innovation aimed at solving agency problem in long distance trade. It was a coalition of Jewish traders that operated in the Mediterranean zone in the eleventh century. In the absence of contractual relations, goods had to be shipped to their destination town before they could be sold. An efficient response to this situation was to use overseas agent to cut costs. This posed serious agency problems as the agent could cheat in the business transactions conducted in far-off areas. The Maghribi traders got around this problem by forming a coalition that retaliated against overseas agents who acted against the interest of its members [Greif (1989)].

Successes from commercial revolution were soon translated into other institutional innovations in the seventeenth century, particularly in England. Introduction of patent laws, joint stock companies, insurance companies, creation of central bank, issuance of bank notes, discounting bills, interest on deposits are all example of innovations that created opportunities for accumulation of physical and human capital for innovative activities, for investment in productive activities and, as such, created an environment favourable for growth [North and Thomas (1973)].

3.3. Institutions and Economic Performance—the Evidence

For a long period of time theoretical research on institutions outpaced empirical evidence and that was the strongest criticism against this discipline. Empirical work in this field faced serious problems of (1) definition (Which dimension of overall institutional framework to use); (2) measurement (How best to measure institutions); and (3) endogeniety (Institutions cannot be assumed to be independent of income as higher income can make better institutions more affordable [Nabli and Nugent (1989); Aron (2000); Jütting (2003); and Bennedsen, Malchow-Møller, and Vinten (2005)]. Beginning 1990s, a number of studies incorporated the institutions variable in their growth regression framework [Barro (1991, 1997); Knack and Keefer (1995); Hall and Jones (1999)].[38] Using the data provided by the private risk rating companies [ICRG, PRS] as a proxy for institutional quality, they all found evidence in support of the 'institutions hypothesis'.[39] Improving institutional quality had a positive effect on economic growth.

However, regressing income on institutions poses a serious estimation problem—institutions cannot be assumed to be independent of income. Typically, higher incomes can make better institutions more affordable. A valid instrument for institutions is needed to counter the incidence of reverse causations. Most of the earlier work linking institutions with income did not tackle this problem as they lacked a purely exogenous source of variation for the institutions variable,[40] rendering the results of these studies

[37]One often cited example is the Hanseatic embargo against the city of Bruges that forced the city to adhere to its contractual agreement with the German merchants (*ibid*).

[38]Although not credited for it, Kormendi and Meguire (1985) and Scully (1988) were the pioneering studies in using proxies for institutional variables (indices of economic and political freedom from Freedom House) in growth regressions. In recent years, availability of data and better estimation techniques have opened floodgates of research in this field.

[39]Barro (1991) differs from the other two studies in the sense that he did not use institutional quality indices but instead used war deaths and revolutions to capture political instability in growth regression framework.

[40]Hall and Jones (1999) is one exception, which used distance from the equator as an instrument. They did not, however, check the validity of the instrument.

biased. Acemoglu, Johnson, and Robinson (2001) worked around this problem by utilising differences in mortality rates faced by the European colonialists as an instrument for current institutions.[41] Their estimates suggested that institutions explained approximately three-quarter of the income per capita differences in former colonies, and once institutions were controlled for measures of geography (distance from equator, continental dummies) did not cause income. Later, Rodrik, *et al.* (2004), Easterly and Levine (2003) and Kaufmann and Kraay (2002) also lend support to the institutions hypothesis.

Another issue that has to be solved within this tradition is *which institutions matter*? North (1990) has identified two types of institutions that are needed for growth—contract enforcing institutions, and coercion constraining institutions (property rights).[42] Whereas contract enforcing institutions relate to private contracts *between citizens*, coercion constraining institutions define contract *between the state and its citizens* [Acemoglu and Johnson (2003)]. In a series of papers, Djankov, Glaeser, La Porta, Lopez-de-Silanes and Shleifer (2003), Djankov, La Porta, Lopez-de-Silanes and Shleifer (2002, 2003) and La Porta, *et al.* (1997, 1998, 1999) have stressed the importance of legal system (a proxy for contract enforcing institutions) for growth. Their work, more generally dubbed under "law matters", argues that differences in legal systems cause different political and economic outcomes [Glaeser and Shleifer (2002)].[43] Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003) find that procedural formalism, which is much greater for civil law countries, is related with judicial delays, corruption, and unfair judicial decisions.[44]

La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) report that, compared to common law countries, countries governed by civil law have worse governments, i.e. more interventionist in the sense of less secure property rights, worse regulation, and inefficient implying bureaucratic delays and little tax compliance.[45] Acemoglu and Johnson (2003), in an effort to "unbundle institutions" and determine which institutions matter the most, find that when measures of contract enforcement and property rights are put simultaneously in their regression model, the later trump over contract enforcement institutions. Their results imply a direct effect of property rights on long run development. Legal system (proxy for contract

[41]See following section for their reasoning.

[42]Coercion constraining institutions ensure protection of property rights against expropriation by a predatory state, whereas "the predatory state would specify a set of property rights that maximised the revenue of the group in power, regardless of its impact on the wealth of the society as a whole" [North (1981), p. 22]. Also see Greif (2005) for this point.

[43]Legal systems, across the world, are predominantly influenced by either English common law or French civil law traditions, except for a few countries which follow German, Scandinavian or socialist law. These two systems, which were transplanted to recipient countries through conquest and colonisation, are different from each other in very fundamental ways. Common law relies on independent judges, broad legal principles and oral arguments and was developed in part to protect the rights of common citizens from expropriation by the monarchs. In contrast, civil law relies on professional judges (appointed by the royalty to further the interest of the sovereign), legal codes, and written records [Glaeser and Shleifer (2002)]. As a result, both legal traditions differ in terms of degree of formalism.

[44]Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003) construct an index of legal procedural formalism based on the number of procedures that litigants and courts use to evict a tenant for non-payment and to collect a bounced check.

[45]Same is true for countries governed by social, German or Scandinavian law. In all cases, common law countries have better governments.

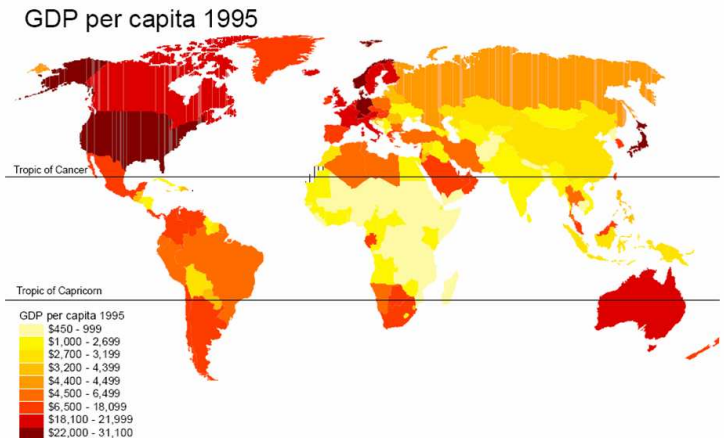
enforcement) does not bear a direct effect on growth, but appears to have an impact on financial intermediation (stock market development).

4. THE ROOT CAUSE: INSTITUTIONS OR GEOGRAPHY?

In previous sections we discussed the two schools of thought and the empirical evidence that they present in favour of their hypotheses. We mentioned earlier in the paper that these factors are now considered as "deeper determinants" that explain more proximate causes of growth. But which of these provides a more *fundamental* explanation of the divergence in economic performance across countries. The *geography school* argues that the climate, soil quality, water availability, and disease ecology of a region has a direct bearing on its growth potential. The *institutions school,* on the other hand, assigns a primal role to the institutions of the society. For them, institutions define the incentive structure facing an individual who then decides whether to invest in capital and to engage in productive activities. What are the arguments put forth by each school in support of their hypothesis?

The *geography school* points out a number of important geographical correlates of modern economic growth. *First*, countries that lie in the tropics are poorer compared to other regions of the world. The average income of tropical countries is $3326, while that of temperate countries is $14828 (excluding socialist countries).[46] Twenty three of the top thirty countries—as ranked by 1995 PPP-adjusted GDP per capita[47]—are situated in the temperate zone. The following (Figure 3) is a map of GDP per capita in 1995 (PPP adjusted) and clearly depicts that tropical countries are poorer compared to temperate zone countries [Gallup and Sachs (1999)].

Fig. 3.



[*Source:* Gallup and Sachs (1999)].

[46]Tropical countries are defined as those where half or more of the land area is within the tropic of cancer and the tropic of Capricorn.

[47]Their source for GDP figures is World Bank's *World Development Indicators1998.*

Second, coastal regions have higher incomes than landlocked regions. Except for a few countries within Western and Central Europe, landlocked economies are nearly all poor. Their average income ($1771) is much smaller than the average income of non-European coastal economies ($5567) [Gallup and Sachs (1999)].

Third, economic growth has been lower for countries afflicted by high disease burden. Of the 150 countries in the world with population of over one million, 44 have intensive malaria. Of these, 35 are in Africa. Malaria intensive countries are on average poorer (average income $1526) than countries without malaria (average income $8268). The richest 31 countries have no malaria. The severity and spread of malaria is linked to the climate and ecology.[48] Successful cases of malaria eradication over the past few decades belong to temperate ecological zones with low nighttime outdoor temperatures and less efficient malaria vectors. Ninety percent of world's malaria is in Africa because sub-Saharan Africa exclusively houses the most efficient vector[49] *Anopheles gambiae* and where *falciparum* malaria predominates[50] [Gallup and Sachs (2000)].

Gallup and Sachs (1999) write that "leading thinkers have pointed to four major areas in which geography will play a fundamental *direct* role in economic productivity: transport costs, human health, agriculture productivity (including animal husbandry); and proximity and ownership of natural resources" [Gallup and Sachs (1999), p. 9]. A number of empirical studies also demonstrate that *geography* does differentiate. Agriculture productivity in the tropics is lower than that in the temperate areas [Gallup (1998)]. Tropical countries share a higher burden of disease, which lowers their per capita incomes by almost 33 percent [Gallup and Sachs (2000)]. Landlocked countries face higher cost of transportation that lowers their growth rate [Radelet and Sachs (1998)].

Remember that the institutions school had asserted that geography has no independent effect on income, apart from an indirect effect working through institutions. Sachs (2003) responds to this claim by regressing income on institutions (rule of law), openness, and geography (malaria prevalence) simultaneously. His results show that malaria has a direct and independent effect on income i.e., it does not lose significance even if institutions variable appears simultaneously in the regression framework. Carstensen and Gundlach (2006) also confirm this result.

In testing Diamond's theory of long-run development, Olsson and Hibbs (2005) report that countries with favourable initial biogeographic conditions made an early transition to sedentary agriculture, which gave them a head start over other regions in terms of technological advancement and thus yielded wide disparities in economic development across the world. According to their study this biogeographic endowment has a direct effect on income even today once the impact of institutions is controlled. In a later work, Hibbs and Olsson (2004) agree that institutions are strongly connected with national economic performance, and that capital accumulation and technological development, the proximate causes of growth, are "molded by the political institutions essential for the smooth functioning of markets", but draw attention to "*still deeper and*

[48]The geographical spread of malaria is determined by the ecology of parasites (different species of malaria plasmodia) and disease vectors (different species of Anopheles mosquitoes) [Gallup and Sachs (2000)].

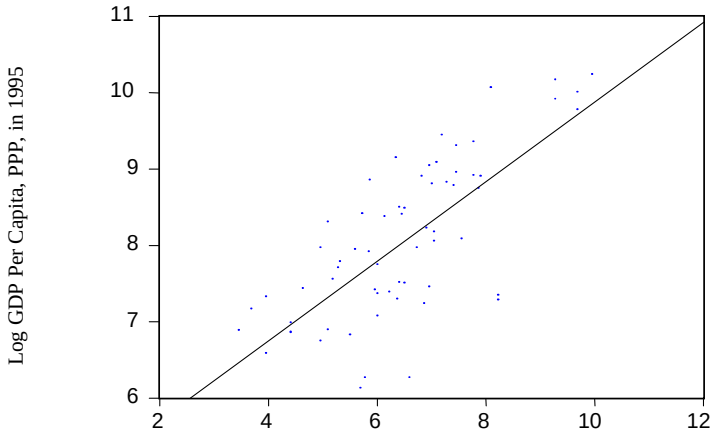
[49]Vector capacity measures the efficiency with which mosquitoes carry malaria from one human to another and has major impact on the feasibility of controlling malaria (*ibid*).

[50]*P. falciparum* is the most malignant form, compared to less serious *P. vivax*, *P. malariae* and *P. ovale* (*ibid).*

more—nearly—ultimate sources of contemporary prosperity"—*the initial biogeographic conditions*.

Of late, the *institutions school* has come out very strongly to assert their point of view. Acemoglu, *et al.* (2005a) write, "economic institution matter for economic growth because they shape the incentives of key economic actors in society, in particular, they influence investments in physical and human capital and technology, and the organisation of production. Although cultural and geographical factors may also matter for economic performance, *differences in economic institutions are the major source of cross-country differences in economic growth and prosperity*" [Acemoglu, *et al.* (2005a), p. 3], emphasis added]. The following is a scatter plot of GDP per capita in 1995 and a measure of property rights—"protection against expropriation risk".[51] This plot shows that countries with better economic institutions (more secure property rights) have higher average incomes.

Fig. 4. Average Protection against Risk of Expropriation 1985–95 and Log GDP Per Capita 1995



The main thrust of the argument of the institutions school of thought in the present debate is that geography affects income only indirectly via its effect on institutions.[52] At least two theories linking geography (endowments) with institutional development are in vogue. One, perhaps more current these days, is the "germs theory"[53] and is due to Acemoglu, Johnson, and Robinson (2001). Their reasoning is summarised here: Europeans adopted different colonisation strategies in different colonies. They established efficient institutions in places where conditions

[51]The data for this scatter plot is taken from Acemoglu, *et al.* (2001). The GDP figures are PPP adjusted per capita GDP for 1995 from World Bank's *1999 World Development Indicators*. The data on property rights comes from Political Risk services (a private company that assesses the risk of investment being expropriated in different countries), and is an average over the period 1985-1995. This measure of property right has been used extensively in research [Knack and Keefer (1995); Hall and Jones (1999); Acemoglu, *et al.* (2001, 2002)].

[52] In previous section we have quoted empirical evidence in favour of institutions hypothesis. Here we limit the evidence to only those studies that work around the institutions-geography framework.

[53] This term was used by Easterly and Levine (2003),

were suitable for their settlement (measured by low mortality rate), and extractive institutions where they could not settle in large numbers and extractive institutions were more profitable for them.[54] These early institutions persisted till present time. Using differences in European mortality as a purely exogenous source of variation for institutions they estimated the effect of institutions on incomes. Their results suggest that, for former colonies, about three quarter of differences in economic performance is explained by differences in institutions. And once institutions are accounted for, geography variables do not explain economic performance.

Earlier Engerman and Sokoloff (1994) had developed a similar argument, called the "crop theory", about the linkages between geography and institutions. They argued that differential resource endowments of the new world influenced the type of institutions that were ultimately established. Land, soil quality and climate of Latin America and the Caribbean were suitable for large scale plantation crops (e.g., sugar). These areas developed highly stratified societies, where white minority élite dominated the majority slave labourers, with extractive institutions. North America, on the other hand, had resource endowment suitable for small family sized farms for wheat production. This led to more homogenous distribution of wealth and power in the society, so more egalitarian institutions developed that protected the rights of a broad base of citizens. Engerman and Sokoloff (1994) further document evidence that the ruling élites hindered accumulation of human capital by the majority of population, and halted development of democratic institutions in Latin America and the Caribbean.

Easterly and Levine (2003) test this "crop theory" of institutional development and confirm the hypothesis that resource endowments affect income indirectly via institutions but do not have a direct effect on income. Rodrik, Subramanian, and Trebbi (2004) extend this endowments— institutions—income framework further by incorporating 'integration' as another "deeper determinant". They test the 'germs theory' of institutional development due to Acemoglu, Johnson, and Robinson (2001). The results of their study also confirm that 'endowments' do not explain income and hence establish the 'primacy' of institutions over geography.[55]

Acemoglu, *et al.* (2005a) further document the Korean experience in favour of the *institutions hypothesis*. Korea gained independence from Japan after World War II. Soon after, it was divided into North Korea and South Korea at the 38th parallel. Before this division, Korea shared same history, culture, and geography.[56] Both countries shared same disease environment, geographical possibilities of access to markets, and transport costs. After this split, the two parts were organised in radically different ways. The North Korea under Kim Il Sung opted for communist policies, and South Korea followed the path of the capitalist system. By the year 2000, per capita income in South Korea was $16100, while that of North Korea stagnated at $1000. Since the geography, disease environment, access to markets and transport costs did not change radically after the separation, the divergent growth experience of the two economies can only be attributed to differences in institutions.

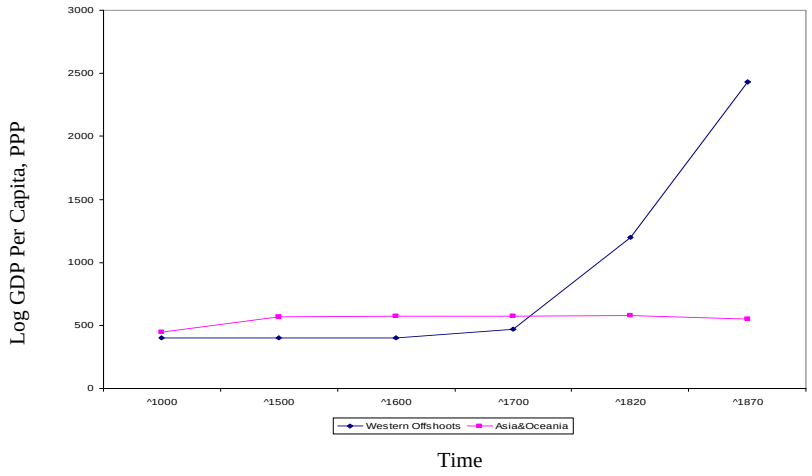
[54] Examples of settlement colonies are: USA, Canada, Australia, and New Zealand.

[55] Both geography and integration variables are insignificant in the regression equation.

[56] CIA Factbook describes climate of North Korea as "temperate with rainfall concentrated in summer" and its terrain as "mostly hills and mountains separated by deep, narrow valleys; coastal plains wide in west, discontinuous in east". It describes climate of South Korea as "temperate, with rainfall heavier in summer than winter" and the terrain as "mostly hills and mountains; wide coastal plains in west and south" [Acemoglu, *et al.* (2005a), p. 18].

The second argument that they put forward in support of the institutions hypothesis is "the Reversal of Fortune" among former European colonies. Around 1500, the Mughals in India, and the Aztec and Inca Empires in the Americas were among the richest of civilisations whereas the territories of North America, Australia and New Zealand were inhabited by less developed civilisations. However, after the European colonisation, there has been a reversal in incomes. Areas where the Mughal, Aztec and Inca Empires once stood are now occupied by societies that are ranked at the lower end of world income distribution, and North America, Australia and New Zealand are among the richest nations today (see Figure 5 below).[57]

Fig. 5. Evolution of Income in Asia and Western Offshoots from 1000 A.D. to 1870 A.D.



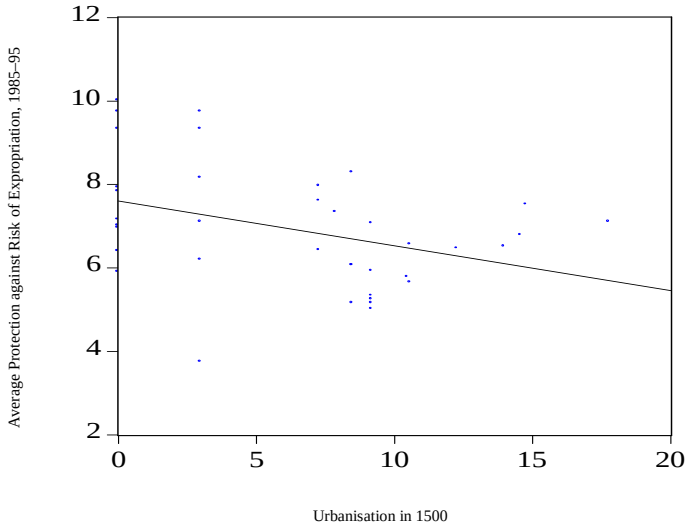
They argue that this reversal cannot be explained by the *geography hypothesis*. The only explanation is offered by the *institutions hypothesis.* In Acemoglu, *et al.* (2002) they provide evidence in support of this assertion. Using urbanisation rates in 1500 A.D. as a proxy for prosperity in former colonies,[58] these authors show that areas that were prosperous before colonisation are poor now, and vice versa. If one goes by the geography hypothesis then areas that were rich in 1500 (owing to their geographical advantage) should be rich today since geography did not change much. This reversal is explained by the fact that European colonialist established worse institutions in places where they could not settle and instead followed an extractive policy. In contrast, areas where they could settle in large numbers efficient institutions were put in place. Current prosperity of these settlers' colonies is explained by institutions hypothesis. The scatter plot below shows that colonies that were rich in 1500 have worse institutions today.[59]

[57] This graph is based on data from Maddison (1995).

[58]Since reliable data for income for all colonies is not available for that period, they argue that only prosperous regions could have afforded large populations.

[59]Institutional data is described above. Urbanisation rates in 1500 are a proxy for prosperity at that time since income data is not available and is taken from Acemoglu, *et al.* (2002).

Fig. 6. Urbanisation in 1500 and Average Protection against the Risk of Expropriation 1985–95



Timing of reversal is another issue for Acemoglu, *et al.* (2005a). This reversal occurred around the eighteenth century when previously poor colonies took over the relatively rich colonies (Fig. 4). This time period coincides with the beginning of the industrial revolution. Diamond (1999) had argued that Europe had an advantage over others continents due to its superior technology. Since this technology was ecological zone specific, i.e., suitable for temperate climates, tropical regions could not use it to their advantage. But reversal in incomes occurred around a time period that is characterised by beginning of the industrial revolution. They argue that it is hard to imagine why industrial technologies will not function in the tropics. For them, the *geography hypothesis* does not explain evolution of world income over the long run. Institutions are the fundamental cause of long-run growth.

Taking the Debate Further—Some Critical Observations

The discussion so far does not provide a clear answer to the basic, and unarguably the most important, question facing the development community today. What is the fundamental determinant of the differences in incomes across the world? Does "geography determine" or "institutions matter"? Which of these two hypotheses provides a more credible account of the evolution of world income overtime? Though the academia has not come to a consensus yet, one can definitely single out the more plausible candidate. In doing so it is also desirable to pose certain questions that each school has failed to address in their respective analyses.

Indeed, the geography hypothesis identifies some important correlates of economic development, but few points are worth mentioning. The geography hypothesis, in its simplest form, stresses a kind of determinism that is time-invariant in its effect.

That is, areas that were rich initially, owing to better geographic endowments, should be rich today. However, we witness that some of the new world economies (USA, Canada, Australia and New Zealand) surpassed the initially more prosperous areas of Asia and parts of Africa (Fig. 5 above). Second, geography school suggests an upper bound on the development capacity of the region owing to its location. It fails to explain why Singapore (and Hong Kong), despite its 'tropical location', joined the league of prosperous temperate zone economies. Gallup and Sachs (1999) write that the average income of tropical countries ($3326) is much below that of temperate countries ($9320). They further write that *if socialist countries are taken out* of temperate zone countries then the average income of this group rises even further ($14828). The question remains, why socialist countries of temperate zone linger behind their capitalist counterparts? If geography is destiny, then why do economic fortunes of North Korea and South Korea, which share similar geography, differ so much? Similarly, if one were to go with Diamond's analysis, then Olsson (2005) very rightly questions why countries of the Fertile Crescent, which have the highest biogeographic potential and where agriculture first appeared, have lagged behind. The geography school has to provide answers to these questions and fill many loopholes before it can be considered as the 'ultimate' factor behind economic performance.

Invariably, the institutions school provides a more credible account of the economic development over the long run. Countries that developed strong and efficient institutions experienced substantial improvements in their incomes. This school, however, has yet to provide satisfactory answer to one important question. If institutions explain differences in income across countries then what explains differences in institutions? Why some societies develop efficient institutions while others do not? Various theories have been put forward in this regard, and they all are based on endowments as the ultimate exogenous explanatory variable. One such attempt is the "germs theory", due to Acemoglu, Johnson, and Robinson (2001), of institutional development. While this theory effectively answers question regarding underdevelopment of former colonies, but what about those countries that were never colonized? Why these societies failed to develop efficient institutions? Another significant effort was by Engerman and Sokoloff (1994) who presented the "crop theory" of institutional development, but their analysis is also partial as it only dealt with the geographic regions of the Americas (North and South) and the Caribbean. There is a need to come up with a holistic theory about development of institutions if we are to have a comprehensive understanding of the long-run development process. And here the institutions school can borrow some more insights from other contemporary research. Olsson (2005) suggests that initial endowments (biogeographic potential) can be one possible factor. Moore (2002) hypothesizes that states relying on unearned income (due to ample supply of natural resources and international aid) do not make an effort to govern their citizens effectively; hence, he incorporates forces of globalisation in his analysis. The institutions school has to widen its scope of analysis to make further progress.

5. CONCLUSION AND POLICY IMPLICATIONS

What is the fundamental determinant of differences in economic performance across countries? The literature has highlighted two such candidates: institutions and

geography. The *geography hypothesis* asserts that these differences are accounted for by the geography (climate, geology, topography, ecology) of a region, which directly affects the quality of land, labour, and production techniques. The alternative, the *institutions hypothesis*, on the other hand, documents economic development of human society as a story of evolution of the institutions of a society. It is the institutions of a society that shape the incentive structure for its people to engage in productive activities. For them, geography does not explain economic performance beyond its ability to explain institutional development. Put simply, the geography school argues for a direct impact of geography on the economic performance of countries, whereas, the institutions school argues that the impact of geography on income runs through its effect on institutions.

In discussing the geography hypothesis, we divided this school into the classics and the contemporaries. The classical work focused attention on climate and topography. The *climate theories* of growth assert that climate of a country shapes work habits and productivities of its people. Wittfogel's (1957) theory of *hydraulic civilisations* brought out importance of topography for development. Important recent contributions in this area include Diamond (1999), Landes (1999), and Scahs and his colleagues [Sachs (2003, 2001); Gallup, Sachs, and Mellinger (1999); Radelet and Sachs (1998); Gallup (1998)]. Contemporary work on geography points out five major areas in which geography directly affects economic productivity—technological development, agriculture productivity, human health, transport costs, and proximity and ownership of natural resources.

The institutions school, however, contends that the enormous variations in incomes across countries are due to differences in institutions. We discussed North's theory (1990) of Institutions. He argues that institutions define the incentive structure for a society so that individuals decide to invest in education, equipment and machineries, innovation and attain prosperity as a result of these endeavors. In describing an institutional account of the long-run development, North and Thomas (1973) and North (1981, 1990) claim that the rise of the Western World can only be explained in terms of evolution of its institutions from inefficient to efficient ones, which allowed individuals and organisations in search of profits to take advantage of economic opportunities. The institutions hypothesis finds empirical support from numerous studies [Knack and Keefer (1995); Hall and Jones (1999); Acemoglu, *et al.* (2001); Easterly and Levine (2003); Rodrik, Subramanian, and Trebbi (2004)].

In discussing the debate about the deeper determinants of growth we reviewed arguments and evidence provided by the two schools of thought, and concluded in favour of the institutions hypothesis as the geography hypothesis does not provide a consistent account of the evolution of world income over the long-run. We also highlighted the weakness of the institutions hypothesis—its inability to explain the process of institutional development, and recommended that this school can proceed ahead by borrowing ideas from other contemporary research [Moore (2002) and Olsson (2005)].

In the end, we endorse the proposition that institutions matter. Existence and enforcement of property rights for a broad cross section of people; enforcement of contracts; rule of law, so that powerful elites are constrained from expropriating the property of other less powerful sections of the society; impartial and speedy dispensation of justice; honest and efficient governments are conditions that are

necessary for protecting fruits of entrepreneurship without which development cannot proceed. Developing countries, like Pakistan, stand to gain a lot from investment in improving their institutional infrastructure. If Pakistan can improve the protection of private property against expropriation to the level of Singapore, its per capita income would increase manifolds nearing income levels in Singapore.[60] "Recognising the importance of institutions in economic development… is the first step toward significant progress in jump-starting rapid growth in many areas of the world today" [Acemoglu (2003), p. 30].

REFERENCES

Acemoglu, D. (2003) The Root Cause. *Finance and Development.* June, 27–30.

Acemoglu, D., S. Johnson, and J. A. Robinson (2001) The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review* 91:5, 1369–1401.

Acemoglu, D., S. Johnson, and J. A. Robinson (2002) Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *Quarterly Journal of Economics* 117:4, 1231–1294.

Acemoglu, D., S. Johnson, and J. A. Robinson (2005a) Institutions as the Fundamental Cause of Long-run Growth. In P. Aghion and S. Durlauf (eds.) *Handbook of Economic Growth.* North-Holland.

Acemoglu, D., S. Johnson, and J. A. Robinson (2005b) The Rise of Europe: Atlantic Trade, Institutional Change and Economic Growth. *American Economic Review* 95:3, 546–579.

Acemoglu, D. and S. Johnson (2005c) Unbundling Institutions. *Journal of Political Economy* 113:5, 949–995.

Akerlof, G. A. (1970) The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics* 84:3, 488–500.

Aron, J. (2000) Growth and Institutions: A Review of the Evidence. *The World Bank Research Observer* 15:1, 99–135.

Auty, R. M. (ed) (2004) *Resource Abundance and Economic Development*. WIDER Studies in Development Economics. Oxford: Oxford University Press for UNU/WIDER.

Barro, R. J. (1991) Economic Growth in a Cross-Section of Countries. *Quarterly Journal of Economics* 106:2, 407–443.

Barro, R. J. (1997) *The Determinants of Economic Growth: A Cross-Country Empirical Study*. Cambridge: MIT Press.

Barzel, Y. (1989) *Economic Analysis of Property Rights*. Cambridge: Cambridge University Press.

Bennedsen, M., N. Malchow-Møller, and F. Vinten (2005) Institutions and Growth—A Literature Survey. Report 2005-01. Centre for Economic and Business Research.

[60]These estimates are based on results from Acemoglu, *et al.* (2001). Pakistan scores a 6.5 on institutional index measuring risk of expropriation against government seizure. Singapore scores 9.32 out of 10. Coefficient of institutional variable is 0.98. Pakistan's per capita income is 7.35 (in logarithm) while that of Singapore is 10.15. Improving its score on institutional index from 6.5 to 9.32 would raise Pakistan's income to 10.11.

Bloch, H., and S. H. K. Tang (2004) Deep Determinants of Economic Growth: Institutions, Geography and Openness to Trade. *Progress in Development Studies* 4, 245–255.

Bok, Hilary (2003) Baron de Montesquieu, Charles-Louis de Secondat. *The Stanford Encyclopedia of Philosophy (Fall 2003 Edition)*, Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2003/entries/montesquieu/>.

Bulte, E. H., R. Damania, and R. T. Deacon (2005) Resource Abundance Poverty and Development.

Carstensen, K., and E. Gundlach (2006) The Primacy of Institutions Reconsidered: Direct Income Effects of Malaria Prevalence. *The World Bank Economic Review* 20:3, 309–339.

Dam, K. (2006) Institutions, History and Economic Development. Chicago John M Olin Law and Economics. The Law School, University of Chicago. (Working Paper No. 271.)

De Silva, K. M. O. (1994) The Political Economy of Windfalls: The 'Dutch Disease'—Theory and Evidence. Downloaded from: http://pgpblog.worldbank.org/files/Dutchdisease_Migara.pdf

Deacon, R. T., and B. Mueller (2004) Political Economy and Natural Resource Use. www.econ.ucsb.edu/papers/wp01-04.pdf

Demsetz, H. (1967) Towards a Theory of Property Rights. *American Economic Review* 57:2, 347–359.

Diamond, J. M. (1999) *Guns, Germs and Steel: The Fate of Human Societies*. New York: W. W. Norton and Company.

Diamond, J. M. http://www.edge.org/3rd_culture/diamond/diamond_p1.html.

Djankov, S., E. Glaeser, R. La Porta, F. Lopez-de-Silanes, and A. Shleifer (2003) The New Comparative Economics. *Journal of Comparative Economics* 31:4, 595–619.

Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer (2002) The Regulation of Entry. *Quarterly Journal of Economics* 117:1, 1–37.

Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer (2003) Courts. *Quarterly Journal of Economics* 118:2, 453–517.

Easterly, W., and R. Levine (2003) Tropics, Germs, and Crops: How Endowments Influence Economic Development. *Journal of Monetary Economics* 50:1, 3–39.

Eggertsson, T. (1990) *Economic Behaviour and Institutions*. New York: Cambridge University Press.

Eifert, B, A. Gelb, and N. B. Tallroth (2002) The Political Economy of Fiscal Policy and Economic Management in Oil Exporting Countries. The World Bank, Washington, D.C. (World Bank Policy Research Working Paper 2899.)

Engerman, S. L., and K. L. Sokoloff (1994) Factor Endowments, Institutions and Differential Paths of Growth Among New World Economies: A View From Economic Historians of the United States. National Bureau of Economic Research. (NBER Historical Paper No. 66.)

Escobal, J. and M. Torero (2000) Does Geography Explain Differences in Economic Growth in Peru. Inter-American Development Bank, Washington, DC. (Working Paper R-404.)

Gallup J. L., J. D. Sachs, and A. Mellinger (1999) Geography and Economic Development. Working Papers Center for International Development at Harvard University. (CID Working Paper No. 1.)

Gallup, J. L. (1998) Agriculture Productivity and Geography. Harvard Institute for International Development. Downloaded from: http://www2.cid. harvard.edu/hiidpapers/agprod.pdf.

Gallup, J. L., and J. D. Sachs (2000) The Economic Burden of Malaria. Working Papers Center for International Development at Harvard University. (CID Working Paper No. 52.)

GilFillan, S. C. (1920) The Coldward Course of Progress. *Political Science Quarterly* 35:3, 393–410.

Glaeser, E. L., and A. Shleifer (2002) Legal Origins. *The Quarterly Journal of Economics* 107:4, 1193–1229.

Greif, A. (1989) Reputation and Coalitions in Medieval Trade: Evidence on the Maghribi Traders. *The Journal of Economic History* 49:4, 857–882.

Greif, A. (1993) Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Trader's Coalition. *American Economic Review* 83:3, 525–548.

Greif, A. (2003) Institutions and Impersonal Change: The European Experience. http://www-econ.stanford.edu/academics/greif_228_2005/Greif%202005% 20Impersonal %20Exchange.pdf.

Greif, A. (2005) Commitment, Coercion and Markets: The Nature and Dynamics of Institutions Supporting Exchange. Downloaded from: http://www-econ.stanford.edu/faculty/Greif_Papers/Commitment_Coercion_ Markets.html

Greif, A., P. Milgrom, and B. R. Weingast (1994) Coordination, Commitment and Enforcement: the Case of Merchant Guild. *Journal of Political Economy* 102:4, 745–776.

Gylfason, T. (2001a) Nature, Power and Growth. Centre for Economic Studies and ifo Institute for Economic Research. Munich, Germany. (CESifo Working Paper No. 413.)

Gylfason, T. (2001b) Natural Resources and Economic Growth: What is the Connection? Centre for Economic Studies and ifo Institute for Economic Research. Munich, Germany. (CESifo Working Paper No. 530.)

Gylfason, T. (2001c) Lessons from the Dutch Disease: Causes, Treatment, and Cures. Institute of Economic Studies. University of Iceland. Iceland. (Working Paper Series W01:06.)

Gylfason, T., and G. Zoega (2001) Natural Resources and Economic Growth: The Role of Investment. Economic Policy Research Unit (EPRU), University of Copenhagen, Department of Economics. Copenhagen, Denmark. (EPRU Working Paper Series 01-02.)

Gylfason, T., T. T. Herbertsson, and G. Zoega (1999) A Mixed Blessing. *Macroeconomic Dynamics* 3, 204–225.

Hall, R. E., and C. I. Jones (1999) Why Do Some Countries Produce So Much More Output Per Worker Than Others? *Quarterly Journal of Economics* 114:1, 83–116.

Harriss, J., J. Hunter, and C. M. Lewis (eds.) (1995) *The New Institutional Economics and Third World Development*. London: Routledge.

Hibbs, D. A., and O. Olsson (2004) Geography, Biogeography and Why Some Countries Are Rich And Others Are Poor. *Proceedings of the National Academy of Sciences* 101: 3715–3720.

Jütting, J. (2003) Institutions and Development: A Critical Review. OECD Development Centre. (Working Paper No. 210.)

Kaufmann, D., and A. Kraay (2002) Growth Without Governance. The World Bank. (The World Bank Policy Research Working Paper Series 2928.)

Kibritcioglu, A. and S. Dibooglu (2001) Long-run Economic Growth: An Interdisciplinary Approach. University of Illinois at Urbana-Champaign. (Working Paper 01-0121.)

Knack, S., and P. Keefer (1995) Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures. *Economics and Politics* 7:3, 207–227.

Kormendi, R. C. and P. G. Mequire (1985) Macroeconomic Determinants of Growth. *Journal of Monetary Economics* 16, 141–163.

Krugman, P. (1995). Development, Geography, and Economic Theory. The MIT Press, Cambridge, Massachusetts.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny (1997) Legal Determinants of External Finance. *Journal of Finance* 52:3, 1131–1150.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny (1998) Law and Finance. *Journal of Political Economy* 106:6, 1113–1155.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny (1999) The Quality of Government. *Journal of Law, Economics and Organisation* 15:1, 222–279.

Landes, D. S. (1999) *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor*. New York: W. W. Norton and Company.

Leite, C., and J. Weidmann (1999) Does Mother Nature Corrupt? Natural Resources, Corruption and Economic Growth. International Monetary Fund. (IMF Working Paper WP/99/85.)

Maddison, A. (1995) Monitoring the World Economy 1820-1992. Development Centre Studies. OECD. Paris.

Matsen, E., and R. Torvik (2003) Optimal Dutch Disease. Norges Bank Research Department. Oslo, Norway. (Working Paper ANO 2003/3.) Downloaded from: http://www.norges-bank.no/publikasjoner/arbeidsnotater/pdf/arb-2003-03.pdf

Mckinley, T. (2005) Why is the Dutch Disease Always a Disease? The Macroeconomic Consequences of Scaling Up ODA. International Poverty Centre. United Nations Development Programme. (Working Paper No. 10.)

Montesquieu, Baron de (1752). *The Spirit of the Laws.* Available at: http://www.constitution.org/cm/sol.txt

Moore, M (2002) 'Bad Governance' or the Development of Political Underdevelopment. Paper presented at the conference on 'Towards a New Political Economy of Development: Globalisation and Governance' at the Political Economy Research Centre, University of Sheffield. July.

Nabli, M. K., and J. B. Nugent (1989) The New Institutional Economics and its Applicability to Development. *World Development* 17:9, 1333–1347.

Nakahodo, S. N., and M. S. Jank (2006) The Fallacy of the Dutch Disease in Brazil. ICONE. Institute for International Trade Negotiations. Sao Paulo, Brazil. (Working Paper).

North, D. C. (1978) Structure and Performance: The Task of Economic History. *Journal of Economic Literature* 16:3, 963–978.

North, D. C. (1981) *Structure and Change in Economic History*. New York: W. W, Norton and Company.

North, D. C. (1990) *Institutions, Institutional Change and Economic Performance*. New York: Cambridge University Press.

North, D. C. (1991) Institutions. *Journal of Economic Perspectives* 5:1, 97–112.

North, D., and R. P. Thomas (1970) An Economic Theory of the Growth of the Western World. *The Economic History Review* 23:1, 1–17.

North, D., and R. P. Thomas (1973) *The Rise of The Western World: A New Economic History*. New York: Cambridge University Press.

Olsson, O. (2003) Conflict Diamonds. Department of Economics. Göteborg University. (Working Papers in Economics No. 86.)

Olsson, O. (2005) Geography and Institutions: A Review of Plausible and Implausible Linkages. *Journal of Economics* 10, 167–194.

Olsson, O., and D. A. Hibbs (2005) Biogeography and Long-run Economic Development. *European Economic Review* 49:4, 909–938.

Pejovich, S. (1990) *The Economics of Property Rights: Towards a Theory of Comparative Systems*. Dordrecht: Kluwer Academic Publishers.

Pritchett, L. M. Woolcock, G. Busby, and J. Isham (2004) The Varieties of Rentier Experience: How Natural Resource Export Structures Affect the Political Economy of Economic Growth. Middlebury College, Department of Economics. (Middleburry College Working Paper Series 0308.)

Przeworski, A. (2004) Geography vs. Institutions Revisited: Were Fortunes Reversed? New York University. (Working Paper Wilf Family Department of Politics.)

Radelet, S., and J. Sachs (1998) Shipping Costs, Manufactured Exports and Economic Growth. http://www2.cid.harvard.edu/hiidpapers/shipcost.pdf

Rodrik, D. (ed.) (2003) *In Search of Prosperity: Analytic Narratives on Economic Growth*. Princeton, NJ: Princeton University Press.

Rodrik, D., A. Subramanian, and F. Trebbi (2004) Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development. *Journal of Economic Growth* 9:2, 131–165.

Ross, M. L. (1999) The Political Economy of The Resource Curse. *World Politics* 51: January, 297–322.

Ross, M. L. (2001) Does Oil Hinder Democracy. *World Politics* 53: April, 325–361.

Runge, C. F. (1984) Strategic Independence in the Model of Property Rights. *American Journal of Agricultural Economics* 66:5, 807–813.

Sachs, J. D. (2001) Tropical Underdevelopment. (NBER Working Paper No. 8119.)

Sachs, J. D. (2003). Institutions Don't Rule: Direct Effects of Geography on Per Capita Income. (NBER Working Paper No. 9490.)

Sachs, J. D., and A. Warner (2001) The Curse of Natural Resource. *European Economic Review* 45:4–6, 827–838.

Scully, G. (1988) The Institutional Framework and Economic Development. *Journal of Political Economy* 96:3, 652–662.

Simon, H. A. (1955) A Behavioural Model of Rational Choice. *Quarterly Journal of Economics* 69:1, 99–118.

Simon, H. A. (1957) Models of Man: Social and Rational. Summary available at: http://cepa.newschool.edu/het/profiles/simon.htm.

Smith, A. [1776] (1981) *An Inquiry into the Nature and Causes of the Wealth of Nations* (Vol. 1 and 2). Indianapolis, Liberty Classics.

Snowdon, Brian (2006) The Enduring Elixir of Economic Growth. *World Economics* 7:1, 73–130.

Stehr, N., and H. v. Storch (1998) Climate Determines: An Anatomy of a Disbanded Line of Research. Downloaded from: w3g.gkss.de/staff/ storch/pdf/Climate.determines.pdf

Whitbeck, R. H., (1916) Review: Civilisation and Climate. *The American Historical Review* 21:4, 781–782.

Wittfogel, K. A. (1957) Oriental Despotism: A Comparative Study of Total Power. Yale University Press. New Haven. Summary available at: <www.riseofthewest.net/ thinkers/wittfogel05.htm>

Woods, D. (2004) Latitude or Rectitude: Geographical or Institutional Determinants of Development. *Third World Quarterly* 25:8, 1401–1414.

World Bank (2004) *World Bank Atlas* (36th edition). The World Bank. <www.undp-povertycentre.org/ newsletters/WorkingPaper10.pdf>