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Institutions and the long-run impact of early development

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ABSTRACT

We study the role of institutional development as a causal mechanism of history affecting current economic performance. Several indicators capturing different dimensions of early development in 1500 AD are used to remove the endogenous component of the variations in institutions. These indicators are adjusted with large-scale movements of people across international borders using the global migration matrix of Putterman and Weil (2010) to account for the fact that the ancestors of a population have facilitated the diffusion of knowledge when they migrate. The exogenous component of institutions due to historical development is found to be a significant determinant of current output. By demonstrating that the relationship between early development and current economic performance works through the channel of institutions and that better institutions can be traced back to historical factors, the results of this paper shed some light on how history has played a role in shaping long-run comparative development.

1. Introduction

This paper studies the role of institutions as a channel through which historical development influences current economic outcomes. The issue of whether history matters for current economic performance has received considerable attention from recent contributions to the literature on long-run comparative development. For example, Nunn (2008) provides evidence showing that Africa's external trade in slaves had a permanent negative impact on economic development in the region. Comin et al. (2010) measure the level of technology for the periods up to 1000 BC, 1 AD and 1500 AD and find that historical rates of technology adoption show a high level of persistence over the last three millennia. They also find that the 1500 AD indicator of technological sophistication is most strongly associated with per capita income today.[1] Putterman and Weil (2010) demonstrate that the length of state history and the timing of agricultural transition are robust predictors for current levels of income.[2] Their findings also indicate that the predictability of these indicators improves substantially once they are adjusted for the location of the current populations' ancestors in 1500 AD, hence suggesting that cross border migration influenced early development's impact on contemporary countries through the dissemination and exchange of knowledge.

While the importance of these historical factors for growth in the very long run and for understanding the variation of income levels across countries today have been well documented in the literature, it is not clear if these effects run through some intermediate channels rather than affect growth or income levels directly. One important channel through which history can affect economic outcomes is institutions (Acemoglu and Robinson, 2012; Nunn, 2009; Putterman and Weil, 2010). Building on the earlier contributions of North and Thomas (1973) and North (1981), who highlight the fact that countries with good institutions are able to use their factors of production more efficiently to achieve higher levels of income, Acemoglu et al. (2001), Engerman and Sokoloff (1997), and La Porta et al. (1997) argue that differences in economic performance today are due to colonial rule that created completely different institutional development trajectories. Hence, their argument concentrates on institutional development as a causal mechanism through which colonial rule influences economic development.

These studies, along with the subsequent contributions of Acemoglu et al. (2002) and Acemoglu and Johnson (2005), among others, focus almost exclusively on the effects of the European expansion and colonialism since the sixteenth century that resulted in the evolution of institutions, and hence the different development paths for former colonies. However, we cannot rule out the possibility that historical factors prior to the major colonization of modern times have also played an influential role in the evolution of institutional development. This paper investigates how current income can be traced to historical forces through the process of institutional development by analyzing the

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[1] Using more recent and comprehensive data on the diffusion of technologies, Comin and Hobijn (2010) show that technology adoption lags have shortened substantially in the past few decades, and the timing of adoption of new technologies over the last two centuries accounts for at least 25% of the cross-country differences in per capita income.

[2] See also the previous contributions of Bockstette et al. (2002), Burkett et al. (1999), Chanda and Putterman (2005), Chanda and Putterman (2007), Putterman (2000) and Putterman (2008).

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specific roles of an early development of successful agrarian systems, the historic presence and formation of polities and state societies, the level of ancient technological sophistication, the ease of adopting the frontiers' technologies due to genetic similarity and geographical proximity, and the extent of economic prosperity up to 1500 AD.

The idea that good institutions are precipitated by the above historical forces is not new. For instance, Diamond (1997) proposes that superior modes of agricultural production following the transition from hunting and gathering to sedentary agriculture, or the Neolithic transition, led to the accumulation of food surpluses. The availability of excess food thus enabled the creation of a class of specialists who could engage in writing legal codes, defining property rights, and developing initial social and political structures, which formed the basis for subsequent institution building.

The emergence of early polities and state societies is another major contributing factor for institutional development. A longer history of statehood, which is often associated with stronger political integration, is deemed conducive to improving institutional capacity because efficient and stable states have more competent bureaucrats who can design effective rules of law (Bockstette et al., 2002). Effective states can also foster linguistic unity that harmonizes social interaction and facilitates the adoption of social norms that reduces the risks of creating weak and fragile states (Chanda and Putterman, 2007).

Furthermore, Mokyr (2003) argues that, historically, institutions and technology have substantial interaction. The effect of technology on institutions can work through several mechanisms. For instance, technological development in the military altered the balance of power between ordinary people and government, thus enabling the creation of centralized states that subsequently provided the rule of law in the modern world. Rapid technological change had also contributed to institutional development when a "factory system" emerged during the Industrial Revolution. Workers were expected to follow certain rules such as being cooperative, punctual, disciplined and willing to accept guidance, all of which lay the foundations of present day institutions.

We argue in this paper that the effects of early development on institutions and how current performance is shaped by historical events are not two unrelated consequences, and hypothesize that the relationship between history and current income reflects the effect of early development working through institutions. To test this hypothesis, we regress current income on previous decade institutions, and instrument the latter using seven different indicators of pre-modern development, henceforth PMD, in 1500 AD, including the timing of agricultural transition, state history, the historical rate of technology adoption, geographical proximity to the regional frontier, genetic similarity to the global frontier, population density, and their first principal component to capture various dimensions of early development. These indicators are adjusted for the effects of global migration using the cross-border population flow data of Putterman and Weil (2010) to account for the fact that when people migrate they bring with them their know-how and ideas. Current institutions are measured as the first principal component of the six Worldwide Governance Indicators of the World Bank, namely voice and accountability, political stability, rule of law, control for corruption, regulatory quality, and government effectiveness.

Our first-stage regressions of current institutions on the above-mentioned individual indicators of PMD deliver economically and statistically significant effects. Technological adoption rates and the overall early development indicator (i.e., the first principal component) are found to be the most significant determinants of institutions. The significance of these migration-adjusted estimates also suggests that the diffusion of knowledge or innovation through cross-border migration has been crucial for institutional development. Our results, based on the two-stage least squares estimator, provide evidence that the exogenous component of the variations in institutions extracted by PMD measures in 1500 AD significantly determines current income.

These estimates rest on the key premise that institutional development is the mechanism through which historical development in the pre-modern eras influences current economic performance. Hence, the exclusion restriction implied by our instrumental variable approach is that PMD in 1500 AD has no direct impact on current income, other than through institutional development. Test results of over-identifying assumptions indeed suggest that the effect of PMD on income only operates through institutions, thus satisfying the exclusion restriction. A major concern with this identification strategy, however, is that our measures of PMD could be correlated with some variables, which may have a direct effect on current economic performance. To ensure that our results are not driven by omitted factors, we control for a number of factors which are potentially correlated with PMD and current income. The estimates are remarkably consistent when we include controls for religion, human capital, early institutions, legal origins, geographic factors, and continent fixed effects.

Our work is closely related to the influential study of Acemoglu et al. (2001), who use data on European settler mortality rates, mostly in the 19th century, to provide evidence that changes in the institutional development resulting from European colonialism has a persistent effect on today's income. Instead of focusing on the role of the European expansion, we show in this paper that historical forces predating European settlement such as the timing of agricultural settlement, the historic presence of supratribal polities, the adoption rates of primitive technology, the accessibility to historical frontier technologies due to geographical and human genetic barriers, and past economic prosperity could have a long-term impact on current performance through influencing the subsequent institutional development. This paper is also related to the important contribution of Putterman and Weil (2010), who show that an early transition to agriculture and a longer state presence are both associated with higher levels of current income, and that state development is positively correlated with several measures of institutional quality, including executive constraint, expropriation risk and government effectiveness. However, the mechanism explaining how agricultural transition and state history, as well as other dimensions of early development considered in this paper, are causally related to income and institutions is not addressed in their study.

This paper proceeds as follows. Section 2 describes the data. The next section presents and discusses the empirical estimates. Several robustness checks are provided in Section 4. Section 5 conducts some further analyses to throw some light on how early development is linked to current income through various dimensions of governance and how different aspects of early technological development affect subsequent institutional development. Section 6 concludes.

2. Data

This section describes the key variables used before presenting the empirical estimates in the next section. A summary list of all variables used, their definitions and data sources is provided in the Appendix (see Table A1). Summary statistics and the correlation structure of these variables are also presented in the Appendix (see Tables A2 and A3, respectively).

2.1. Quality of institutions

The quality of institutions is a summary measure of several key dimensions of their development constructed using the World Bank's Worldwide Governance Indicators, including: 1) voice and accountability; 2) political stability; 3) rule of law; 4) control for corruption; 5) regulatory quality; and 6) government effectiveness. The data are provided for more than 200 countries over the period 1996–2009. These indicators are constructed using a wide variety of different sources, which reflect governance perceptions reported by survey respondents, public, private and other non-governmental organizations worldwide. A detailed description of the methodology used to construct this data set is provided by Kaufmann et al. (2010).