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## Great Divergence and Great Convergence in a Global Perspective

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Since man first forged metal tools and started farming for his food, thus emerging from the Stone Age, no event in human history has had a greater impact than the Industrial Revolution of the eighteenth and nineteenth centuries. During that span, Europeans increased their use of fossil fuel energy by several orders of magnitude, began to use that fossil fuel energy to produce motive power as well as heat, and developed a host of high-efficiency industrial processes and new modes of transportation, with spillovers into military technology as well. As a result, Europeans went from ‘underdeveloped’ nations, who mainly traded raw materials and bullion for the manufactured and plantation goods of the ‘developed’ world of Asia (cotton and silk textiles; ceramics and lacquer ware and tropical woods; coffee, tea, indigo, nuts, and spices), and who were allowed limited trading roles on the suffrage of India, China, and Japan, to the world's center of manufacturing and manufactured exports, with military dominance and the ability to dictate terms of trade to the major Asian societies.

The shorthand summary of this process for the last two centuries has been the ‘Rise of the West’ and explaining it has been one of the central questions of the social sciences. The traditional view since the time of Karl Marx and Max Weber, extended by the twentieth century scholars such as William McNeil (1963, 1990) and David Landes (1998), was that since the Middle Ages, Europe was a uniquely creative society that advanced in agriculture, accounting, use of wind and water power, and craftsmanship, while Asian societies reached their peak of development in the medieval period, and thereafter simply maintained themselves in a kind of

‘frozen’ state of development or even declined. While in the medieval period the societies of Abbasid Islam and Song China might have started at a higher level of economic productivity and technology than Europe, the ‘rise’ of European productivity and technology over the succeeding centuries led to European global domination by the nineteenth century.

Yet, in the last two decades, a group of comparative sociologists and global historians have offered a counter-narrative, led by scholars of the ‘California School’ of global historians (Goldstone 1991, 2002, 2008a, 2008b; Pomeranz 2000, 2002; Wong 1997; Frank 1998; Marks 2002; Vries 2003, 2010). This counter-narrative called attention to the continuing vitality of agricultural and manufacturing technology in Asia, with India and China remaining world-dominant manufacturing powers up through the seventeenth century. It illustrated relatively high living standards among the Asian agricultural population, comparable to those in Europe, up to 1800. And it demonstrated that Asian merchants and pirates were the equal or superior of European trading companies in wealth and military prowess until the late 1700s. In this counter-narrative, the dominant position of Europe arose rather quickly, not as a long ‘rise’ but as a sudden ‘Great Divergence’ from roughly equal levels of productivity and material well-being *c.* 1750 to clear European dominance a century later.

Both the traditional view and the California school view prompted similar questions: What caused Europe to reach clear superiority in wealth and power *c.* 1850? And is this superiority destined to last a long time, or will it disappear as quickly as it arrived? Yet, they provided very different answers. The traditional view sought to explain a long-term rise by deep and lasting features of European societies – their religious pluralism and heterodoxy (especially Puritanism and Calvinism), their heritage of Greek democracy and science and Roman law, the competitive multi-state system in which they were embedded, regimes of secure property rights and superior accounting of profit and loss, more advanced systems of credit provision, much higher levels of wages achieved by urban workers, and long-lasting experience in transnational and transcontinental trade. From all of these, military superiority and accelerating productivity growth naturally emerged. Yet, since it took many centuries for this pattern of mod-

ern industrial economic growth to be established, rooted in unique and characteristically European institutions and cultures, it would take a very long time (if ever) for non-European societies to converge in income and productivity levels with the West.

The California School takes the opposite view. Since the divergence was late and rapid, they emphasize advantages that appeared late and somewhat by chance: the discoveries that American colonies could produce bountiful cheap cotton for European industry, and that England's abundant coal could be used to fuel piston and rotary engines; the sudden eighteenth century breakthroughs in mechanical engines and production techniques by British metalworkers and craftsmen; and the internal conflicts that undermined the efficiency of Chinese, Ottoman, and Indian agriculture and crafts and governance, amplified by European military aggression. For many of the California School, since the surge of European dominance was short and based more on recent acquisitions and discoveries than long-lasting and unique characteristics, there was every reason to expect that non-European countries would quickly catch up. The success of Japan and South Korea in reaching Western levels of technology and living standards, and the recent growth of China and India at much faster rates than Western nations, suggests that this viewpoint is a more accurate template of current conditions.

For the last decade, proponents of the traditional view and the California school have argued, producing more details and additional arguments to buttress their case. But neither side has won the argument – instead the weaknesses of both positions now stand revealed. On the one hand, many assumptions of the traditional view, that Europe was superior in military technology, trading acumen, and scientific advances as early as the 1500s or earlier, have been shown to be unfounded (*cf.* Agoston 2008; Andrade 2015; Ragep and Feldhay 2015). On the other hand, many assumptions of the California School, especially that the most advanced regions of China had incomes per head equal to those in the most advanced regions of Europe as late as 1800, have been called into doubt (Allen *et al.* 2011; Li and van Zanden 2012). As a result, the era from 1500 to 1800 has emerged as central. Yet our view of those centuries remains cloudy: Of the many characteristics and circumstances that separated European societies from Asian ones in these centuries,

which were critical for the later emergence of European domination after 1800?

Into this confusion, Leonid Grinin and Andrey Korotayev bring clarity and order. They treat the period from 1450 to 1830 as a lengthy period of innovation and productivity increase in Europe, starting from a relatively low level of inventive activity and technology, but proceeding through a series of phases, of which the last phase – from 1760 to 1830, constituting the ‘classic’ Industrial Revolution – was only the final phase of a lengthy process. These phases began with a ‘preparatory’ period from 1100 to 1450 in which the development of free labor and capitalist relations set the stage for profit-seeking and further economic developments, peaking in the rich luxury manufactures of Venice and the trade and accounting and artistic and scientific breakthroughs of the Renaissance. Then the ‘long sixteenth century’ from the late fifteenth to the early seventeenth century showed remarkable advances in oceanic navigation, engineering, windmills and water power, and commercialized high productivity agriculture, led by the Portuguese and Spanish, but also Germany and the Netherlands. This was also the age of the great discoveries and the early breakthroughs to the mechanical model of nature in European sciences. After this period, the next phase arose from the early seventeenth century through the third quarter of the eighteenth century, led by advances in Britain and especially the Netherlands. This period saw the consolidation of constitutional monarchy in Britain and of oligarchic republican rule in the Netherlands; the latter’s development of mechanization, fishing, warehousing, and complex industrial centers; and the rise of global trading companies and military advances, especially in naval warfare. All of these prior developments then set the stage for the ‘final phase’ of the Industrial Revolution utilizing fossil-fuel and water-powered machinery and major advances in chemical processes and transport as well.

This new view, carefully presented and rigorously modeled by Grinin and Korotayev, provides a richer and more nuanced version of the ‘Great Divergence’, bridging many of the differences between the traditional and California viewpoints. Yet they go further. Amazingly, by building a model utilizing human capital (education), global population growth, and regional productivity, they show how both the Great Divergence and the recent ‘Great Convergence’ (the economic catching up of developing countries) are phases of the same

process of global modernization. They make it clear that once begun, the Great Divergence inevitably leads to later Convergence through the globalization of the world economy. Yet they also explain specific regional lags and variations in this process. This is a remarkable achievement and a major advance in the debate on the long-term trajectory of global economic development. The Russian global-historical systems school of scholarship has long been making important contributions to identifying and explaining the major patterns in long-term world history (Turchin and Korotayev 2006; Turchin and Nefedov 2009; Korotayev *et al.* 2006a, 2006b; Korotayev and Tsirel 2010; Grinin 2007, 2011a, 2012a; Grinin and Korotayev 2006). It is a pleasure to introduce this latest work to a broader audience, and commend it to all those who are interested in the debate on the rise of the west and Great Divergence, and all who ponder the future of global inequality and development.

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