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ARENAS IN GLOBAL HISTORY: DATING THE GREAT DIVERGENCE
CLOSING REMARKS

Why understanding the timing of divergence matters

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What is divergence and why does it matter?

The question motivating all of us is to understand what led up to modern economic growth. Malanima is correct that I follow Kuznets and describe this as *rapid and sustained growth in both population and output per head*, but I would now add a third qualifier, *to levels beyond the pre-industrial peak*. All three qualifiers are necessary because history has many examples of *sustained growth* in population and output per head: as van Zanden and Bolt show in their comment, both Britain and Holland had positive trend growth in real GDP/capita all the way from the late Middle Ages to the eighteenth century. It seems clear that classical Greece and Rome each had at least three centuries of sustained growth in population and GDP/cap as well, and China likely did also before achieving the heights reached in the Northern Song.[1] But all of these *sustained growth* episodes were very slow, as van Zanden and Bolt show in their regressions for Holland and England, where real income growth averaged not more than 0.2% per year.

There were shorter periods of much more *rapid* growth, which I have labelled 'efflorescences.' In these cases, a combination of technical innovations in farming or transport or other production allows higher output that supports urbanisation and more extensive trade, which in turn leads to greater specialisation, greater monetary circulation and profits that feed further investment to boost productivity, in a virtuous cycle.[2] In post-classical Europe, the High Middle Ages in the north, Renaissance Italy and Golden Age Holland are examples; outside Europe, the peaks of the Song and Qing dynasties in China, the early Baghdad Caliphate and perhaps the Mughal Empire under Akbar are likely others. But over time, population continues to grow, trade patterns change, climate shifts, administrative inefficiency, wars and diseases take their toll and after a century or less, rapid growth in GDP/cap comes to an end.

Finally, past episodes of rapid and/or sustained growth, as beautifully shown by Broadberry's Figure 5 above, showing GDP/cap in the leading regions of China and Europe, often approached but never reached beyond an apparent limit in GDP/cap of about $1800.[3] Instead, from classical times up to 1750, as Malanima makes clear, GDP/cap fluctuated in a relatively narrow band under

[†]I wish to thank my commentators twice over. First, for providing the data that were the subject of my essay. I am a comparative-historical sociologist, trained to seek patterns and causal relations in world history; without the incredible work of these scholars, I and other world historians would be far poorer and less able to do our work. My debt to them, and my admiration for their truly path-breaking achievements, is immense. Second, I thank them for so thoughtfully responding to my interpretation of their work. Their replies force me to sharpen my argument and consider new approaches to the data.

[1]S. Broadberry, H. Guan, and D. Li, "China, Europe and the Great Divergence: A Study in Historical National Accounting," *Journal of Economic History* 78 (2018): 955–1000; J. Ober, *The Rise and Fall of Classical Greece* (Princeton: Princeton University Press, 2018); P. Erdkamp, "Economic growth in the Roman Mediterranean World: An Early Good-Bye to Malthus?," *Explorations in Economic History* 60 (2016): 1–20.

[2]G. Grantham, "Contra Ricardo," *European Review of Economic History* 3 (1999): 199–232.

[3]J. Goldstone, "Urbanization, Citizenship and Economic Growth in the Long Run," *International Review of Social History* 65 (2020): 1009–124.

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this limit, until after 1820 growth breaks out and becomes exponential. This is the 'Great Divergence'—it is the *divergence from the past*, that is, from all prior patterns of growth in GDP per capita. Prior to 1750, there are only 'little divergences' among societies and across time periods. Still, these little divergences may be of great significance, if we can identify a pattern in these early variations in GDP/cap that distinguished Great Britain, or Europe, where the Great Divergence initially took place, from other times and places.

Malanima argues that these early divergences had no such significance. In his view, 'The sharp bend after 1820 was preceded by small oscillations around a straight line and nothing else.' What mattered for the great divergence was not any prior growth patterns, but a technological revolution: the ability to convert heat to 'mechanical use; that is the ... revolutionary innovation in the use of energy' that fueled the shift to modern growth. I wholly agree with him! In this view, prior growth patterns did not make Britain, or Europe, uniquely likely to achieve this breakthrough; for that we need to look at prior changes in culture, nature-knowledge, religion, political authority and other factors that served as either encouragements or obstacles to this discovery.[4]

In contrast, Broadberry and van Zanden and Bolt argue that there was an important 'little divergence' between Europe and China, in particular northwest Europe, that made a difference for future growth. For Broadberry, the uniqueness is twofold: first, Britain and Holland responded to the Black Death not merely by recovering earlier levels of GDP/cap, but by leaping forward to new heights and then sustaining them; this was then followed by two big leaps forward—in Holland from 1530 to 1640 and then in Britain from 1650 to 1800—that carried Europe to the threshold of modern economic growth. In contrast to this pattern of upward bounds without major declines, other regions in Europe and China may have reached high levels of GDP/cap but had major growth reversals. Italy's GDP/cap declined after 1450 and never recovered; China's GDP/cap fell down what looks like a slide from 'chutes and ladders' after 1700. Only northwestern Europe had a record of upward leaps without major declines. To quote Broadberrry's comment above: 'Although other west European economies shared in the growth of per capita incomes after the mortality crisis of the Black Death, only Britain and Holland retained the gains and avoided shrinking as population growth returned, before building on these gains during the early modern period, culminating in the first transition to sustained modern economic growth in eighteenth century Britain'.[5] Van Zanden and Bolt also argue against a cyclical pattern of growth, noting 'after 1348 growth was consistent and persistent in Holland and England,' and fit a regression trend line to show that while slow, the trend line was positive for the entire period.

I concede to Broadberry and Van Zanden and Bolt that growth was generally positive from 1300 to 1800 in Holland and Britain. Yet, I do not think that this invalidates the position of myself and Malanima. This is because there is yet more data to consider. Moreover, by fitting trend lines on their data for different periods, one can arrive at quite distinct conclusions.

Levels and patterns of GDP/cap growth

Broadberry claims that after the Black Death, England enjoyed 'a permanent boost to per capita GDP, ... remaining on a plateau with substantially higher per capita income.' As shown in his Figure 6 above, he estimates that England's GDP/cap rose from an index level about 50 in 1270–1340 to about 75 from 1400 to 1570, a roughly 50% increase. But was this really a leap

[4]J. Mokyr, *A Culture of Growth: The Origins of the Modern Economy* (2016); J. Goldstone, "Divergence in Cultural Trajectories: The Power of the Traditional within the Early Modern," in *Comparative Early Modernities 1100-1800*, ed. David Porter (New York: Palgrave-Macmillan, 2012), 165–92.

[5]S. Broadberry and J. Wallis, "Growing, Shrinking and Long Run Economic Performance: Historical Perspectives on Economic Development," National Bureau of Economic Research Working Paper No. 23343, 2017, http://www.nber.org/papers/w23343.

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to a higher level? We cannot be sure from Broadberry's data because his starting point is 1270–1340. That is famously known, for English historians as a period of crisis when population pressures seemed to be lowering incomes.[6] Indeed, Broadberry et al., in their Table 5.07, show strongly negative growth rates of real GDP/head in this period: −0.29% per year in 1270–1300 and then −0.12% per year in 1300–1350.[7]

If England's GDP/cap was in sharp decline heading into the Black Death, might it have been higher earlier? New evidence suggests it was. We have known for some time that the high Middle Ages in England were a period of considerable urbanisation, expanding commerce, and of course the construction of magnificent cathedrals, which hint at considerable reserves of surplus capital and labor. We have also known that population was quite high, as were grain yields: both may have peaked at levels not seen again until the seventeenth century.[8] But we have had no real quantitative measures for the economy as a whole.

A brilliant new article by, among others, van Zanden plots cathedral construction in European countries in terms of cubic meters of new construction per capita from the eighth to the fifteenth centuries.[9] They correctly note that 'Accounts of the European economy as it entered a more dynamic phase sometime between the 10th and 12th centuries [currently] lack temporal and spatial precision,' which they argue their data help remedy. They make a strong case that cathedral construction reflected prosperity in the wider economy, both from observations in later periods, where GDP/cap and construction show similar trends, and the large volume and wide variety of materials and skilled craftsmen required, observing that 'Each major project was an intrinsically economic undertaking with significant multiplier effects for the wider economy.'

Their data show that Great Britain had an exceptionally high level of cathedral construction from 1100 to 1250, with a peak c. 1150.[10] But then a steep decline set in—construction fell by half from 1250 to the early 1300s. This was followed by a strong rise to 1400, just as suggested by Broadberry for the fourteenth century. But the level of construction in 1400 only reached the same level as the early 1200s, and the peak in the twelfth century was more than twice that level. Both the sharp rise and steep decline in per capita construction in Britain were much sharper than in other European countries, especially compared to Italy, where construction showed a much milder rise and decline in the same period. The Low Countries by contrast showed no major fall before 1300, instead they do show a slight temporary boost from 1350 to 1400, but that is imposed on a steady upward trend line that began in the early Middle Ages and then after 1400 construction returned to that longstanding trend.

It thus seems likely that the significant 'leap forward' that Broadberry claims for Britain after the Black Death was nothing of the sort. Instead, it appears to have been a sharp rebound after an unusually steep fall in GDP/cap in the late Middle Ages. The rebound was much less in Italy because Italy had neither as sharp a rise in the twelfth century nor as steep a fall in the thirteenth. For Holland, the post Black Death rise in incomes appears not as a new sudden increase, but as a continuation of a medieval boom that petered out after 1400.

Looking closely at Broadberry's Figure 6 above, one can see how 'odd' it is to call England's gains in GDP/cap after the Black Death an 'improvement.' In fact, *both* GDP *and* population continued to decline all the way from 1350 to 1470; GDP/cap only rose and was sustained because population fell even *more* sharply than GDP and then both declined in tandem for more than a century afterwards.

[6]J. Aberth, *From the Brink of the Apocalypse: Confronting Famine, War, Plague and Death in the Later Middle Ages* (London: Routledge, 2001).

[7]S. Broadberry, B. Campbell, A. Klein, M. Overton, and B. van Leeuwen, *British Economic Growth, 1270–1870* (Cambridge: Cambridge University Press, 2015).

[8]C. Dyer, *Making a Living in the Middle Ages: The People of Britain, 850–1520* (London: Yale University Press, 2009).

[9]E. Burlingh, B. M. S. Campbell, A. Rijpma, and J. L. van Zanden, "Church Building and the Economy During Europe's 'Age of the Cathedrals', 700–1500 CE," *Explorations in Economic History* 76 (2020): 101316.

[10]Burlingh, Campbell, Rijpma and van Zanden, "Church Building," Figure 5.

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Tracing GDP, we see it does not recover its level of 1270 until about 1560. Then, when population growth becomes a bit more rapid after 1570, we see a distinct decline in GDP/cap from 1570 to the 1630s. From the 1640s to 1700, there is a burst of growth in GDP/cap, but this is not because of any change in the long-term slow growth of GDP. That continues on the same path. It is the population curve that changes, flattening out from the 1630s to 1700; if that curve had kept its trajectory since 1470 constant, England's GDP/cap would have remained unchanged from its centuries-long plateau.

From about 1720, GDP grows faster, but population does as well, swallowing up most of the gains so that GDP/cap growth remains slow, much slower than from 1650 to 1700. Broadberry's own calculations show that from 1700 to 1750 GDP/cap growth returned to its long-term rate of increase of just 0.19% per year.[11]

Putting aside our argument over whether agricultural growth then lifted that rate after 1750, Broadberry makes much of the combination of positive growth in population and GDP/cap in the half century 1700–1750 as heralding a new era of non-Malthusian growth. But in fact there was nothing novel or unusual about having a half century of slow population growth (0.77% per year) and very slow GDP/cap growth (0.19% per year), as occurred in this period. Broadberry et al.'s own data (again from table 5.07) show that England had essentially the same performance in 1550–1600 (pop growth 0.62% per year, GDP/cap growth .19% per year), and it signalled nothing; GDP/cap then dipped down for the next half century. Holland of course had performed much better still from the 1540s to the 1640s, with population growth and GDP/cap growth *both* around 1% per year, then never attained anything like that combination again until after 1800.

In the working paper from which van Zanden and Bolt draw the data for their comment, the authors observe, noting the return to slow growth after 1700, that 'in the eighteenth century the British economy went through a "Malthusian intermezzo"' before launching into modern economic growth in the nineteenth century.[12] That is exactly what I observe in the data as well: taking all the evidence into account, and looking at the movements of both population and GDP and not just GDP/cap itself, the data show that up to 1750 Britain remained in an essentially Malthusian economy, where GDP/cap growth was generally non-existent, and the short bursts of sharp gains in real income after 1350 and 1650 depended on a pause or decline in population growth. Moreover, this poor growth performance occurred at a level of GDP/cap that even in 1750 remained far below that of Holland, and by Broadberry's own estimates, about the same as China's leading region in 1700 or as Northern Italy in 1450.[13] I certainly can grant Broadberry's point that by 1750 Britain was well ahead of China; but that was because after 1700 China's GDP/cap had fallen so sharply, not because Britain had reached extraordinary heights. The Great Divergence *from the past* was not prefigured in Britain by either a unique leap forward in GDP/cap after the Black Death or by any evidence of strong tandem growth in population and GDP/capita until after 1750 and (depending on how the debate on British agriculture in the late eighteenth century is resolved) perhaps not until after 1800.

Regarding Holland, there is no doubt that if one draws a *single* trend line through the data, then the slope is consistently positive from 1348 to 1800. I agree with van Zanden and Bolt that regression allows you to use all the data; but a single trend line regression does not *keep* all the data; rather it throws away all the deviations from the trend line to present the average growth rate from the beginning to the end of the period of observations. Thus, one can get very different results by fitting a trend line to different periods. If you fit one line to Dutch GDP/cap from 1348 to 1620, and another from 1620 to 1800, you get a dramatically different pattern: growth is much more

[11]Broadberry, Campbell, Klein, Overton, and van Leeuwen, *British Economic Growth, 1270–1870* (Table 5.07).

[12]A. De Pleijt and J. L. Van Zanden. A tale of two transitions: the European growth experience, 1270–1900. *Maddison project Working Paper*, WP 14, 2020.

[13]Broadberry, Guan, and Li, "China, Europe," 955–1000.

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rapid in the first period and disappears altogether in the second. I am not alone in seeing the data as showing a marked change in Holland's growth trajectory after the early-seventeenth century: Broadberry and Wallis analyse Holland's total factor productivity (TFP) growth and observe that Holland's 'period of positive TFP growth [prior to 1620] was followed by a period of strongly negative TFP growth between 1620 and 1665, and barely positive TFP growth thereafter, so there was no trend increase in TFP over the period 1540–1800 as a whole. The Dutch example thus serves as a reminder that growth reversals can occur in TFP as well as GDP per capita, and that the transition to modern economic growth requires an end to TFP growth reversals as well as GDP per capita growth reversals'.[14]

In sum, taking van Zanden's reflection on Broadberry's data, finding a 'Malthusian Intermezzo' in eighteenth-century England, and Broadberry's analysis of van Zanden's data, finding no net growth in Holland after 1620, one must conclude that neither Holland nor Britain had clearly established themselves on a path to modern economic growth prior to the late-eighteenth century.[15]

Conclusion

When the California School gathered, the long-standing view of the rise of the West, anchored in enormously influential works from Marx and Weber to Landes and Wallerstein, was that European civilisation had long been economically superior to other regions of the world. The California School historians argued, first from comparisons with China, but also from a closer look at patterns of growth within Europe, that in fact, when the Industrial Revolution began, living standards in Europe were not that different from what they had been in Europe several centuries earlier, nor that different from what they were at periods of peak prosperity in China, often earlier still.

The data developed and presented with such skill and erudition by Broadberry et al., Malanima, van Zanden and van Leeuwen and many other truly remarkable scholars (listed in footnote 1 of Broadberry's comment) have largely borne out this revised view. Their work has shown that before 1750, though growth was strong in many times and places in Europe (Renaissance Italy, sixteenth-century Holland, late seventeenth-century England, in Hamburg during the Hanseatic League, etc.), that growth did not spread to the hinterlands, and it always gave way to periods of subsequent stagnation or decline. England—where the Industrial Revolution began—was, as late as 1700, still not yet at the level of GDP/cap reached by Italy 250 years earlier, nor much advanced beyond levels reached by the leading areas of China at that time, and even earlier. In sum, the emergence of modern economic growth after 1750 has to be understood as something that emerged rather late and suddenly, and was not prefigured, much less caused, by a distinctive pre-industrial pattern of growth in GDP/cap.

That is an enormous shift from earlier views, and now based on far richer and better data than Pomeranz or others like myself had when we ventured these speculations two decades ago.[16] As Malanima argues so eloquently, that points us in other directions, such as understanding

[14]S. Broadberry and J. Wallis, "Growing, Shrinking and Long Run Economic Performance: Historical Perspectives on Economic Development," National Bureau of Economic Research Working Paper No. 23343, 2017, http://www.nber.org/papers/w23343, p. 18.

[15]J. L. van Zanden and B. van Leeuwen, "Persistent but not Consistent: The Growth of National Income in Holland, 1347–1807," *Explorations in Economic History* 49 (2012): 119–130.

[16]J. Goldstone, "The Problem of the 'Early Modern' World," *Journal of the Economic and Social History of the Orient* 41 (1998): 249–84; K. Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000).

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the technology of energy capture and use to explain why Britain forged ahead, and the equally puzzling issue of why other places—from Holland to Baghdad to India to China—did not discover the simple principles of air pressure, how to manipulate vacuums or to calculate the efficiency of work. That of course leaves an enormous amount of work to be done. But at least now it can be done on a much firmer basis of knowing when the divergence from the past took place, as an essential foundation for understanding how and why.

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