How Well Did Facts Travel
to Support Protracted Debate
on the History of the Great Divergence
between Western Europe
and Imperial China?

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Abstract

With the ongoing debate of the Great Divergence since 2000, a wide range of works have been published to compare economic performance of Western Europe with that of China. The upsurge in the divergence scholarship has however been dogged by an issue of reliability and compatibility of 'facts'. A reason is that non-Chinese speaking academics tend to accept stylised facts from Chinese sources too readily without checking, which makes, more often than not, the Chinese part of the story a liability rather than an asset. We here challenge that well-circulated notion that 'any number is better than no number': No number does not make any number right.

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Abstract

With the ongoing debate of the Great Divergence since 2000, a wide range of works have been published to compare economic performance of Western Europe with that of China. The upsurge in the divergence scholarship has however been dogged by an issue of reliability and compatibility of 'facts'. A reason is that non-Chinese speaking academics tend to accept stylised facts from Chinese sources too readily without checking, which makes, more often than not, the Chinese part of the story a liability rather than an asset. We here challenge the widely circulated notion that "Any number is better than no number." No number does not make any number right."

1. The Divergence Debate: A Brief Review

A virtual brigade of economists, economic historians and a sociologist from western and Chinese universities have been heuristically engaged with an analytical narrative published in a seminal book by Kenneth Pomeranz, *The Great Divergence. Europe, China and the Making of the Modern World* in print in 2000. The core theses for that debate have been elaborated and discussed. Its main hypothesis is that divergence in standards of living afforded by the economy for populations contained within the political boundaries of the Ming-Qing empire of China (1368–1911) did not fall behind the levels of well-being afforded to the populations of the national economies of Western Europe until late in the eighteenth century (Daly 2015). Given this is indeed a <u>fact</u>, there could be no reasons to accept views elaborated by a long line of 'Eurocentric' political philosophers (Bossuet, Weber, Montesquieu, Hume, Hegel, Tocqueville, Herder, Comte), and classical economists (Smith, Malthus, Mill, Marx and Weber). They claimed that the political, legal, institutional and cultural frameworks sustaining and conditioning the evolution of production in the Chinese empire that had for centuries before the first industrial revolution placed and maintained the development of the imperial economy upon a path dependent trajectory that led inevitably to a condition of relative backwardness compared to the economies of Western Europe (Bryant 2006; Lebow 2006).

The almost instantaneous reaction to these ostensibly implausible claims from Eurocentred economists and economic historians (with credentials in neo-classical economics and with expertise and reputations derived from scholarship locatable within the Kuznetsian paradigm for empirical economics) was to launch three programmes of scholarly research (Allen et al. 2005; Fogel 2013). These programmes are designed to subject the novel theses communicated by Pomeranz and supported by the California School and other cosmopolitan radicals to the heavy artillery of statistical-cum-econometric 'tests' (Hatton et al. 2007). Predictably that bombardment has concentrated on two indices or indicators for the representation of relative economic success or

retardation among and across the national economies of Europe and the imperial economies of Asia, namely GDP per capita and real wage levels (Broadberry and Hindle 2011). Both indicators dominate theories and vocabularies deployed by economists to specify model and measure convergence among an OECD group of developed economies in the 1980s (Baumol 1994). But recognizing that the pre-modern Chinese economy was composed of household units of production engaged with agricultural, combined with domestic industrial production a third and potentially more promising (but also research intensive) programme has attempted to investigate sources of evidence that could conceivably be used to construct estimates for the net annual incomes and per capita consumption levels afforded to more representative samples of the Chinese population who experienced modal levels of material well-being as members of households engaged in peasant farming and domestic industry (Li 1998; Pomeranz 2002 and 2006; Allen 2009; Broadberry et al. 2015b).

All three programmes generated numbers and presented them as negotiable estimates or conjectures for GDP per capita and real wages available for debate and revision on both conceptual and statistical grounds. These statics purport to be comparable to the refined and constantly revised estimates available for England, Holland and other European countries for at least two centuries before their transitions to industrial market economies (Broadberry and O'Rourke 2010; Broadberry et al. 2015a).

2. Chinese GDP Per Capita from the Han Dynasty to Modern Times

Unfortunately, as we have shown in tedious detail in working papers locatable on websites and in three published articles, the volume range and quality of the data for China accessible in secondary sources does not provide the required run of estimates either for GDP or for total population let alone for a sequence of purchasing power parity rates of exchange required to convert estimates expressed

in Chinese currency at current prices into a numeraire that supposedly allows for the construction of bench-marked estimates in constant prices over centuries of time as well as unambiguous comparisons with a range and quality of estimates that are in print for Britain and other European national economies in early modern times (Deng and O'Brien 2015, 2016a and 2016b).

Alas the short cut methods that Maddison resorted to in order to circumvent his very tightly constrained access to anything approximating to acceptable data cannot in our view be condoned by historians who wish to engage seriously with trends and long cycles for a long run and acceptably quantified explicandum that maps a chronology for divergence between China and the West. Since Maddison has always been commendably transparent about the sources and methods, he utilized to construct estimates for GDP for an impressively wide range of countries and continued to be so in the first and revised editions of his economic history of China, there will be no need to go into details. For those who have and continue to cite his enticing estimates that purport to measure the growth of GDP per capita from the Han Dynasty (207 BCE – 220 AD) to modern times and to compare benchmarked levels with European economies in a common numeraire for pre-modern times, it should be sufficient to simply tabulate the reasons why a school of experts with reputations in Chinese economic history and, latterly, a platoon of distinguished economists have found them to be conceptually and statistically unacceptable as historical evidence (Deaton and Heston 2010; World Bank 2013; Ma and Herman, 2014; Vries 2015; von Glahn 2016):

Maddison utilized just two estimates for China's GDP in current prices. One for 1990 and another unofficial estimate for 1933 (Maddison 2007; Liu and Yeh 1965). All other benchmarked estimates for GDP contained in his book are based: (a) upon backward extrapolations (1990–1870), deploying estimates for GDP growth published by two economists for 1913–33; (b) a guess that this same growth rate prevailed from 1870–1912; (c) an implausible assumption that the annual growth rates for GDP (ostensibly generated by a deflator constructed to measure movements in Chinese domestic

prices over more than a century of time), were consistent both with growth rates that simultaneously reference changes in the volumes and prices of goods and services produced in China with estimates designed for purposes of international comparison expressed in international dollars for 1990 (Johnson 2009). Maddison's third assumption has, moreover, been revealed to be implausible by the reconstituted and improved purchasing power parities utilized by the World Bank to convert the GDPs of 146 and 199 countries into international dollars for 2005 and 2011 (World Bank 2008 and 2013). Conversions at these recently published and improved rates of exchange have generated estimates for the GDPs of China, India and many other countries in international dollars that differed in a highly significant degree from those generated by the conversion coefficients calibrated in prices and quantities of 1990 (Asian Development Bank 2007). Indeed, the variation in GDP that flowed from the utilization of conversion coefficients based upon data for any single (if not singular) years, 1990, 2005 and 2011), has prompted two economists closely engaged with the construction of purchasing parities to conclude that: 'comparisons became less reliable the further apart are the structures of GDP (or its components) of the countries being compared'. They then added 'that many of these numbers have substantial uncertainty and that extrapolations over long periods can easily lead to results that made no sense' (Deaton and Heston 2010). Indeed and our own sensitivity test which converted the Maddison estimates of GDP per capita for years 1 to 1850 into kilocalories per day per capita produced numerical outcomes that suggested: (a) that between 1300 and 1850 Chinese per capita income remained at twice the modern level prescribed by the F.A.O for food security; (b) that level was above the levels sustaining the 'labouring poor' of England over this period, and (c) that Maddison's estimates expressed in kilocalories are in no way congruent with the historical narratives that he and other scholars have written, which represents the economic history of the Chinese Empire (after its famous efflorescence under the Song Dynasty) as one of stasis and decline from 1300–1956 (Maddison 2007; Deng and O'Brien 2016b); (d) the per capita levels of food security implied by estimates in GDP per capita in constant 1990 international dollars imply that

China's ruling elites could have expropriated something approximating to half of the empire's national income (Milanovic et al. 2007). There is no historical evidence that the peoples of China experienced exploitation on that scale, even under the alien and oppressive Mongol dynasty (Deng 1999). Maddison's estimates for GDP per capita for benchmarked years circa 1 AD, 1000, 1300, 1500, 1600, 1700, 1820 and 1850 are based on forward extrapolations from a figure of 450, 1990 international dollars (Maddison 2007). He derived this particular base line number from controversial and ongoing attempts by economists employed by the World Bank to construct a metric for a notional and universal poverty line (Ravallion et al. 1998, 2004 and 2008; Konkel 2014). That concept and its conjoined estimates have come under sustained theoretical and empirical attacks (Anand et al. 2010; Allen 2013). Apart from the difficulty of imagining survival on an income of US$1.25 a day in modern America, the number is seriously out of kilter with recent poverty lines constructed by the Chinese government (Wu 1983; Liu 1990; Huang 1992 and 2007; Liu et al. 2014). Furthermore, the deployment of international dollars as a numeraire implies that any poverty line would fluctuate over time, not merely with incomes received and the prices of commodities and services purchased by impoverished groups of the populations residing in the Chinese empire between the Han dynasty and late Qing dynasty, but with the incomes and prices confronted by those living in poverty in all other parts of the world outside the Middle Kingdom (Allen 2011; Anand et al. 2010). Finally, rates of growth used by Maddison to extrapolate his preselected figure of 450 international dollars for GDP per capita for base Year 1 AD forward in time in order to provide benchmarked estimates for the years 1000, 1300, 1500, 1600, 1700, 1820 and 1850 are based on assertions that do not in our view stand up either to detailed scrutiny or meet several objections raised against them by historians with credentials and claims to expertise in the economic history of imperial China (Xu 2007; Fan 2008; Liu 2009 and 2010). Maddison offered no citations to support the implicit rates of growth applied to construct estimates for the centuries from Year 1 AD to 1368 (Li et al. 1983; Feuerwerker 1992; Deng 1999; Cao 2001; and Holz 2006).

His evidence for rates of growth for the subsequent Ming-Qing period, 1368–1911, were, however, derived from a classic study of Chinese grain output by the Harvard economist and sinologist, Dwight Perkins in his *Agricultural Development in China 1368–1968* (1969). Perkins' book (which we have also examined forensically) is another laudable and heuristic endeavour to provide an acceptable proxy for a key macro-economic index that could serve to measure long-run trends in grain output measured in unhusked rice equivalents (Peng 1957 and 1984; Wu 2009; Guo 2012).

Unfortunately, historians with the linguistic and scholarly credentials required to validate Chinese primary sources know that the imperial state never seriously attempted: to measure grain output; to standardize the measures or record the total areas of the empire cropped or cultivated with rice and other grains; to systematically collect estimates for yields per unit of land cropped with grain; to standardize the area for a 'mu' of land; or to provide figures for the wastage rate that flowed from the conversion of unhusked to husked edible rice (Shi 2012). Perkins did his best to cope with a range of ambiguous and recalcitrant official data and almost recognized that they could not be calibrated or manipulated to form an index that might be accepted as reliable enough to estimate changes in grain output from 1368 to 1911. He reluctantly fell back on the assumption that measure output per capita of unhusked rice that he asserts fluctuated within limits around a modal average of 286 kilogrammes of unhusked rice (transformable into 143 kilogrammes of husked) per capita per annum (Perkins 1969). Thus, Perkins' conjectures for long term trends in grain (and by extension agricultural) output can be represented as an a priori selected constant of 286 kilogrammes of unhusked rice, multiplied by a range of disputed estimates for total population to which he attached rather wide but potential margins of error (Wu 2009; Shi 2012).

Maddison neither verified the evidence behind the Perkins' estimates, nor did he subject their deployment as proxies for the growth of GDP per capita to sensitivity tests. We simply observe that any run of statistics for grain output based upon an unverified assumption of constant output per

capita will be highly correlated with conceptually flawed estimates for GDP per capita also expressed in constant 1990 international dollars. This exercise in abstract and circular quantification will leave an impression of long run stasis that is almost impossible to support with references to China's rich historiography (Elvin 1973; Wong 1997; Pomeranz 2000).

Maddison sought to reinforce his view that 'over the long run in the Ming-Qing dynasties, income per capita was roughly stable' by citing data from another eminent American sinologist that little change had occurred in the proportion of the population living in towns between the Tang and Qing dynasties (Maddison 2007). More recent research on the empire's urbanization ratio has, however, called Gilbert Rozman's statistics, published more than 40 years ago, into question (Li 2005; Cao 2001 vol. 5, pp. 723, 828–9; Hou 2001 vol. 6, pp. 482–3). Furthermore, for both global and Chinese economic history the familiar supposition that an urbanization ratio has been or indeed could be unambiguously measured within acceptable margins of error across space and over time and that this ratio remained closely correlated with trends in GDP per capita is, to say the least, unproven and improbable (Bairoch 1988; Morris 2013; Chandler and Fox 1987; Pasciuti and Dunn 2014). While applauding the heuristic value of Maddison's endeavours, we conclude that for the economic history of China, they do not provide an index for the measurement for the empire's long run growth, nor a statistically based chronology for divergence or even plausible numerical conjectures that could be used to compare its levels of development with Europe (Deng and O'Brien 2016b).

3. Nominal and Real Wages for Major Cities in the Orient and Occident

Another more realistically conceived programme which retains far greater potential for these purposes is a collective endeavour led by Robert Allen and Jan Luiten van Zanden (Allen 2001; van Zanden 1999) to reconstruct and compare estimates for the real income levels sustaining wage dependent unskilled labourers and their families resident in a very small sample of Chinese, Indian,

Japanese and Ottoman cities with a larger and better validated sample that refers to their counterparts employed in the towns and cities of Western, Southern and Eastern Europe Comparable evidence for Europe (particularly Western Europe) is more extensive, abundant and potentially reliable because the relative proportions of the workforce in Asian economies, dependent on waged labour to sustain standards of living for their populations, was significantly smaller (Lucassen 2005). As late as the 1890s the Chinese 'proletariat' continued to represent but a tiny proportion (5–10%) of the Qing workforce – a fact which raises doubts about the relevance of inferences that might be drawn for reciprocal comparisons, based upon wage dependent labour (Liu 1990; Li 2005).

As scholars with expertise on the economic history of China have observed, this methodological issue might be more convincingly resolved (not solved) by a comparison between the incomes of the 'labouring poor' employed as waged labour in Europe's urban construction industries and agricultures on the one hand and the incomes of Chinese peasant households on the other (Liang 1980; Deng 1999 chs 2–3; Guo 2012).

We deal with that well taken observation in Section 4. Here we offer several reasons why recently published statistics calibrated to compare the living standards of waged labour in China (and India, and possibly Japan?) with ostensibly similar groups of workers employed in the major European cities and agricultures are insecure (Francks 2013). While these exercises are potentially promising those published so far are based upon the incomplete and defective primary and secondary sources for nominal daily wage rates available for Ming and Qing China (Wu 1983; Liu 1990; Huang 1992; Liu et al. 2014). Nominal daily wage rates have long been recognized as an intractable source of evidence for the measurement of productivity and standards of living for European economic history (Scholliers 1989). For China, India and other parts of Asia with far less extensive, integrated and competitive labour markets the evidence in primary sources required to standardize nominal daily wage rates recorded in governmental, judicial and only very rarely in business records into plausible estimates for the annual earnings of wage dependent proletarian unskilled male workers is

almost never clear or clarified (Hofmeester et al. 2016). For example, the sources provide entirely limited information on such payments in kind as food, clothing, shelter, etc. (Peng 1963; Li et al. 1983; Liu 1990). Such payments were, however, a feature of all pre-modern wage systems because they alleviate risks associated with fluctuations in food prices and obviated the difficulties of securing currency in the forms and denominations required to remunerate labour (Marks 1991; Wang 1992; Kishimoto 1997; Yu 2000; Huang 2007).

Chinese sources refer to annual, weekly, monthly and daily wage rates, but supply virtually no information on the numbers of days worked. Observations recovered from governmental sources are marked by long term stability over time and across space (Moll-Murata, n.d.). Prima facie they look analogous to fixed pay scales, maintained for the remuneration of soldiers or bureaucrats (Zurcher 2013). Most of the evidence recently uncovered consists of records of daily rates that fell below the amounts required to purchase sufficient rice for 'food security' (Deng and O'Brien 2015, 2016a and 2016b).

4. Comparisons of the Incomes of Peasant Households of Jiangnan with the Incomes of Wage Dependent Unskilled Labour Employed in English Towns

Nominal wage evidence was generally recorded in the official unit of account (taels of silver) which was neither a standardized officially minted coin, for the empire as a whole, nor convertible at any official and stable rate of exchange into copper cash or *wen* – the currency utilized for local purchases of goods and services (Kuroda 2013). Even copper coins were cast in different ways, denomination and copper content at no less than 50 provincial mints. Thus the virtually unregulated monetary system has added an almost insurmountable layer complexity to the endeavours of modern economic historians attempting to convert scant and ambiguous evidence for nominal daily wage rates into annual incomes expressed in a numeraire that might facilitate reciprocal comparisons

across Eurasia (King 1965; Kuroda 2005; Moll-Murata n.d.; Li et al. 1983; Wu 1983; Liu 1990; Huang 1992; Liu et al. 2014). Even if these obstacles could be circumvented the inferences that could be drawn from acceptable estimates for relative levels of real wages would remain too circumscribed to settle core questions formulated by Pomeranz and cogently addressed by Peer Vries and others who continue to debate the historical origins for the Great Divergence (Vries 2015). The Weberian view that the economies of East Asia (and South Asia) were for some centuries prior to the Industrial Revolution on trajectories leading to divergence might, however, derive stronger statistical support from exercises in quantification that have generated more acceptable estimates for the relative standards of living afflicting the lives of the labouring poor in the west and majorities of the Chinese labour force engaged in household units of production in the east (Bryant 2006; Brenner and Isett 2002).

This particular and potentially most fruitful of all approaches for quantifiable investigations into the Great Divergence has been explored by innovatory exercises by Philip Huang and Bozhong Li who have reached diametrically opposed conclusions on the standards of living afflicting (*pace* P. Huang) or enjoyed (*pace* Li) peasant households in the Yangtze delta under the Qing dynasty (Huang 1988; Li 1998). That region around Lake Tai (Jiangnan) has long been widely regarded among economic historians of China as the most commercialized and economically advanced of the empire (Faure 2015). Ken Pomeranz and Bozhong Li and Jan Luiten van Zanden have selected this province as apposite for comparisons with England and Holland (Li and van Zanden 2012). In published articles, we have reconfigured and recalibrated recently published data that purported to measure the net incomes of a tiny sample of hopefully 'representative' peasant households for benchmarked years that refer to their conditions in the early seventeenth, mid-eighteenth and early nineteenth centuries (Deng and O'Brien 2015, 2016a and 2016b).

Essentially our methodology consists of conversions utilizing price data for the <u>net</u> output/incomes accruing to these households from agricultural production and the manufacture of

coarse cotton cloth into edible rice equivalents and transforming their disposable incomes measured in kilograms of rice equivalents into kilocalories per capita per day (Liu et al. 2014; Deng and O'Brien 2015).

In an exchange of correspondence (July 2016), Kenneth Pomeranz has agreed with our methodology but has expressed doubts about the data we use for modal land labour ratios for the eighteenth century. 'Facts' are in his words 'stubborn things' to establish. Nevertheless, these procedures provided us with figures for levels and changes in the standards of living for peasant households in Jiangnan from circa 1600 to circa 1829. We compared these conjectures with estimates embodying far superior claims to represent levels and trends in kilocalories potentially available to unskilled labour employed in English agriculture and the construction industries of southern English towns for benchmarked periods 1600–50, 1651–1700, 1701–50, 1751–1800, 1801–50 (data for England e.g. Allen 2001, 2009, 2015; Clark 2007; Broadberry et al. 2015a). If our recalibrated data derived from recently published secondary sources is regarded as sufficiently secure for a reciprocal comparison then some tentative and negotiable inferences flow from these imperfect numbers that lend support to the views that Peer Vries has been developing in response to contrary claims made by Ken Pomeranz in his seminal book of 2000 (Pomeranz 2000; Vries 2013).

Our clarified and recalibrated estimates suggest that from the early seventeenth century onwards, the state, institutions and foundational culture of the Chinese empire was failing to cope with 'the pressures of numbers and environmental degradation' nearly as well as the states and economies of Western Europe. Joseph Bryant's restatement of a Weberian view that the potential for specialization, trade and technological innovation between and among families, villages, town and regions of the Qing (and let us add the Ottoman and Mughal) empires had diminished over time, has some imperfect statistical evidence to commend it (Bryant 2006).

To conclude: our general view is that the information currently available for China and in more dubious quality for India is and may well remain too fragmentary (Struder 2016), ambiguous and

insecure to sustain a Kuznetsian perception for investigation into the historical origins of the Great Divergence. As that becomes accepted, other paradigms and historiographical traditions for the construction of metanarratives of the kind, depth and quality we are now reviewing, could be formulated as second best solutions to an intractable problem of uncovering 'facts', figures and concepts that really can travel in order to facilitate reciprocal comparisons between the West and East (Howlett and Morgan 2010), at very least we might begin to reach a consensus view of the Great Divergence before we move on to analyse the Great Convergence (Baldwin 2016).

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