ACCOUNTING FOR THE GREAT DIVERGENCE

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Abstract: As a result of recent work on historical national accounting, it is now possible to establish firmly the timing of the Great Divergence of living standards between Europe and Asia. There was a European Little Divergence as Britain and Holland overtook Italy and Spain, and an Asian Little Divergence as Japan overtook China and India. The Great Divergence occurred because Japan grew more slowly than Britain and Holland, starting from a lower level. Key turning points are identified around 1348 and 1500, and a framework is developed to explain these divergences via the differential impact of shocks on economies with different underlying structures. The key shocks were the Black Death of the mid-fourteenth century and the new trade routes which opened up from Europe to Asia and the Americas at the end of the fifteenth century. The key structural factors were the extent of sectoral diversification, the nature of state institutions and the quantity and quality of labour.

I. INTRODUCTION

The debate over the Great Divergence of productivity and living standards between Europe and Asia has had a remarkable impact on the economic history profession. For more than a century, economic historians had worked within a general framework where the Industrial Revolution was seen as the culmination of a process of gradual improvement, beginning in the late middle ages and continuing through the early modern period. As Europe transformed its institutions and accumulated capital, Asia stagnated and began to fall behind. The Industrial Revolution and nineteenth century colonialism were seen as accelerating this process of divergence, but were not seen as its fundamental causes. Pomeranz (2000) questioned what he saw as the Eurocentric bias of this account, claiming that as late as 1800, the Yangzi Delta region of China was as developed as Britain and Holland, the richest parts of Europe. Other parts of Asia were also seen as equally developed at the end of the eighteenth century. This chimed with the work of Frank (1998) and other economic historians working in California, and became known as the California School. Parthasarathi (1998) has claimed parity of living standards with Britain for South India during the late eighteenth century, while Hanley (1983) has argued for high living standards in nineteenth century Japan.

However, despite the fundamentally quantitative nature of the revisionist claims being made, this work was not generally based on systematic analysis of data. Whilst this was understandable given the past focus of quantitative economic history on the modern period, and particularly the period since the mid-nineteenth century, the last decade or so has seen tremendous progress in the extension of the quantitative approach both back in time and across space to cover Asia as well as Europe, and this paper draws on this work to provide an account of the Great Divergence. The word "accounting" is used here in two ways,

embracing both measurement and explanation. The firmest conclusions will be in the area of measurement, because that is where most progress has been made recently, but there have also been advances in understanding the explanatory factors leading to the Great Divergence.

This paper argues that the revisionist authors of the California School have massively exaggerated the development level of the most advanced Asian economies in 1800, so that their most striking claim turns out to be false. Nevertheless, the debate has had an enduring positive effect on economic history, since it would now be impossible to make a serious comparison between Europe and Asia without emphasising regional variations within both continents. Much of this paper hinges on regional differences within both continents, and these differences were barely visible in the literature as recently as a decade ago. Although the Great Divergence between Europe and Asia had its origins in the late medieval period and was already well under way in the early modern period, as in the traditional economic history literature, there was a great deal of regional diversity, as suggested by the California School. Within Europe, there was a massive reversal of fortunes between the North Sea Area and Mediterranean Europe. This is sometimes known as the Little Divergence, and involved Britain and Holland overtaking Italy and Spain. Within Asia, there was also a reversal of fortunes with Japan overtaking China and India in another Little Divergence. Although this account therefore suggests some similarities between Japan and the North Sea Area, which seems consistent with the views of the California School, it is important to bear in mind that Japan started from a lower level and grew at a slower rate than the North Sea Area, and thus continued to fall behind until after the Meiji Restoration of 1868. This means that a Great Divergence was occurring between Europe and Asia at the same time as the Little Divergences within both continents.

As well as quantifying the timing of the Great Divergence in terms of GDP per capita comparisons, this paper also offers an account of the Great Divergence, in the sense of explanation. The framework adopted here is to see the divergences as arising from the differential impact of shocks hitting economies with different structures. Two shocks played an important role in the process of divergence. First, the Black Death of the mid-fourteenth century led to a permanent upward shift of per capita incomes in the North Sea Area, which did not occur in the rest of Europe or Asia (Epstein, 2000; Allen, 2001). Second, the new trade routes which opened up from Europe to Asia and the Americas around 1500 accelerated the process of divergence. Both shocks had long-lasting effects through their interaction with structural features of the different economies. The first structural factor is the extent of sectoral diversification, covering both the importance of the livestock sector within agriculture and the balance between agriculture and non-agriculture (Broadberry, Campbell, Klein, Overton and van Leeuwen, 2014). The second structural factor is institutions, with the role of the state helping to explain the success of the North Sea Area through the growth of state capacity, but balanced by constraints on the executive (Epstein, 2000; O'Brien, 2011; Acemoglu, Johnson and Robinson, 2005). The third structural factor is the quantity and quality of labour. Although it is possible to point to an "industrious revolution" in the North Sea Area, which helps to explain the Little Divergence within Europe, the term was first coined in the context of Japan during the Tokugawa Shogunate and points to similarities as well as differences between Japan and the North Sea Area (de Vries, 2008; Hayami, 1967). There are further similarities between Japan and the North sea Area, affecting the quality of the labour force, with high female age of first marriage leading to lower fertility and more investment in human capital (de Moor and van Zanden, 2011).

2. MEASURING ECONOMIC GROWTH BEFORE 1870

Until recently, most accounts of economic growth before 1870 were largely qualitative. That changed with Maddison's (2001), *The World Economy: A Millennial Perspective*, published shortly after Pomeranz's (2000) *The Great Divergence*. Table 1 sets out Maddison's estimates for the four European countries and the three Asian countries which will be the focus of attention in this paper. The four European countries have been chosen to include the richest parts of Europe in the late middle ages (Italy and Spain) and in the modern period (Holland and Britain). Similarly, the Asian economies have been chosen to include the richest parts of Asia in the early part of the second millennium (China) and in the modern period (Japan). Although Maddison's (2010) dataset represents a major breakthrough for quantification of long run economic growth, it contains a large amount of "guesstimation", with a number of observations set at or close to $400 in 1990 international prices. This is equivalent to most people living at "bare bones subsistence", or the World Bank poverty level of $1 per day, with a small rich elite on top. Furthermore, Maddison provides his conjectural estimates only for a small number of years.

Stimulated by Maddison's work, economic historians have recently begun to produce estimates of per capita income in a national accounting framework, based on hard data, and a firmer picture has begun to emerge of the contours of long run growth and development in both Europe and Asia. This is possible because medieval and early modern Europe and Asia were much more literate and numerate than is often thought, and left behind a wealth of data in documents such as government accounts, customs accounts, poll tax returns, parish registers, city records, trading company records, hospital and educational establishment records, manorial accounts, probate inventories, farm accounts, tithe files and other records of religious institutions. With a national accounting framework and careful cross-checking, it is possible to reconstruct population and GDP back to the medieval period.

2.1 Europe's Little Divergence

For some European countries, abundant quantitative information has survived, so that historical national accounts can be constructed on a sectoral basis in great detail. Britain and Holland have very rich data, with historical national accountants able to build on decades of detailed data processing by generations of scholars as well as well-stocked archives (Broadberry, Campbell, Klein, Overton and van Leeuwen, 2014; van Zanden and van Leeuwen, 2012). For other countries, where information is more limited, or where there has been less processing of existing data, Malanima (2011), Álvarez-Nogal and Prados de la Escosura (2013) and others have developed a short-cut method for reconstructing GDP. In the short-cut method, the economy is first divided between agriculture and non-agriculture. In the agricultural sector, output is estimated via a demand function, making use of data on population, real wages and the relative price of food, together with elasticities derived from later periods and the more recent experience of other less developed economies. An allowance can also be made for international trade in food. For the non-agricultural sector, output is assumed to have moved in line with the urban population, but with some allowance made for rural industry and the phenomenon of agro-towns. This output-based GDP is helpful in bridging the gap between the macro approach of growth economists and the sectoral approach of much economic history.

The new estimates based on historical national accounting, presented here in Table 2, revise upwards the level of per capita GDP in the middle ages. Medieval western Europe was substantially richer than Maddison thought, and subsequent growth therefore more gradual. The British data from Broadberry, Campbell, Klein, Overton and van Leeuwen (2014) cover the territory of England before 1700 and Great Britain after 1700, while the Dutch data from

van Zanden and van Leeuwen (2012) cover the territory of Holland before 1807 and the Netherlands after 1807. The Italian data from Malanima (2011) cover central and northern Italy, excluding the south, while the data of Álvarez-Nogal and Prados de la Escosura (2013) cover the territory of modern Spain.

Before the Black Death in 1348, per capita incomes were substantially higher in Italy and Spain than in England and Holland. There then followed a reversal of fortunes between the North Sea Area and Mediterranean Europe, so that by 1800 per capita incomes were substantially higher in Great Britain and the Netherlands than in Italy and Spain. The first turning point was the Black Death. As population fell sharply after 1348, Italy, England and Holland all experienced a substantial increase in per capita incomes. Britain and Holland received a permanent boost to living standards from this, but in Italy, incomes fell back to their pre-Black Death level with the return to population growth from the mid-fifteenth century. Notice that Spain did not share in the general increase of per capita incomes after the Black Death, even in the short run. The second turning point in the Little Divergence occurred around 1500 as new trade opportunities opened up between Europe and Asia around southern Africa and between Europe and the Americas across the Atlantic. Whereas in 1500 per capita GDP was around $1,500 in both Italy and Holland, there then followed a surge of per capita incomes in the North Sea Area, led initially by Holland during its Golden Age of the sixteenth and seventeenth centuries, then by Britain during its Industrial Revolution of the eighteenth and nineteenth centuries.

One further point is worth noting from the annual data plotted in Figures 1 and 2. This is the alternation of periods of positive and negative growth, with growth booms typically followed by growth reversals, leaving little or no progress in the level of per capita incomes

over the long run. This is particularly clear in the cases of Italy and Spain in Figure 1, where per capita GDP fluctuated without trend between 1270 and 1850. For the cases of Britain and the Netherlands in Figure 2, although there are alternating periods of positive and negative growth until the eighteenth century, there is also a clear upward trend, with the gains following the Black Death being retained, and the growth reversals eventually disappearing with the transition to modern economic growth. One way to think about Europe's Little Divergence, and also the Great Divergence, is therefore not so much the beginnings of growth, but rather the weakening and ending of growth reversals. It should be noted that in Figure 2, the data for England have been spliced to the data for Great Britain in 1700, while the data for Holland have been spliced to the data for the Netherlands in 1807, so as to provide continuous series in Figure 2.

2.2 Asia's Little Divergence

Data are available in abundance for some Asian economies for some time periods, but there has been relatively little work so far processing this material. Much work remains to be done on the Chinese data, but it is now possible to produce annual estimates of GDP from the output side, apart from during dynastic changes (Broadberry, Guan and Li, 2014). Japan also has a wealth of data, but at this stage the estimates are closer in spirit to the short-cut methods used for Italy and Spain than to the full output-based estimates for Britain and Holland (Bassino, Broadberry, Fukao, Gupta and Takashima, 2014). Indian data are less abundant, and it has so far only been possible to produce estimates back to 1600 (Broadberry, Custodis and Gupta, 2014). Apart from Abū 'l-Fazl's [1595] remarkable document, *The Ā' īn–i-Akbarī*, from the highpoint of the Mughal Empire, most of the information about India comes from the records of the European East India Companies and the British Raj.

The results for Asia in Table 3, like those for Europe in Table 2, suggest a general upward revision of early GDP per capita compared with Maddison's estimates. However, Japan had very low levels of per capita GDP at the start of the second millennium, then experienced an episodic growth pattern, with per capita GDP increasing first between 1450 and 1600, then remaining on a plateau before a second growth phase beginning around 1720. This pattern of growth phases alternating with periods of remaining on a plateau to produce a long run upward trend is similar to that experienced by Britain and Holland, which is characterised by van Zanden and van Leeuwen (2012) as "persistent but not consistent". However the long run growth rate was slower in Japan than in the North Sea Area. China's per capita GDP, by contrast, was on a downward trajectory from its high-point during the Northern Song Dynasty, when China was the world's per capita income leader. On these estimates, Japan overtook China during the eighteenth century. India shared in the Chinese pattern of declining per capita GDP from 1600, at the height of the Mughal Empire under Akbar. Japan caught up with India during the seventeenth century and pulled ahead only during the eighteenth century.

The Asian Little Divergence thus parallels the European Little Divergence quite closely. Japan followed a similar trajectory to the North Sea Area economies of Britain and Japan, with a general upward trend. And just as stagnation and decline characterised Europe outside the North Sea Area at this time, so too there was stagnation and decline in Asia outside Japan. Of course, China is a large economy, and it would be desirable to disaggregate further, in the spirit of the California School, to see whether the Yangzi Delta was on a par with Japan until the nineteenth century, for example.

Li and van Zanden (2012) have produced a comparison of GDP per capita in the Yangzi Delta and the Netherlands in the early nineteenth century, finding per capita incomes in the Yangzi Delta to be 53.8 per cent of the level in the Netherlands during the 1820s. This suggests a per capita GDP figure of $1,050 for the Lower Yangzi, in 1990 international dollars, above the Japanese level at this time. Note also that a recent paper by Roy (2010) produces an estimate of GDP per capita for Bengal, the first part of India to fall under British control. Roy finds that per capita incomes in Bengal were around 20 per cent of the British level in the 1760s. This is a bit lower than the average suggested by Broadberry, Custodis and Gupta (2014) for India as a whole, falling from 34 per cent in 1750 to 27 per cent by 1801. However, this would be expected for a relatively poor region such as Bengal.

2.3 The Great Divergence

Table 4 puts together the new GDP per capita estimates for Europe and Asia from Tables 2 and 3, to provide a focus on the Great Divergence. Although China was richer than England in 1086, it must be remembered that England was a relatively poor part of Europe in the eleventh century. Comparing China with the richest part of medieval Europe, it seems likely that Italy was already ahead by 1300. However, care needs to be taken here, since a smaller region of China such as the Yangzi Delta may still have been on a par with the most developed parts of Europe in 1500, which would be consistent with the accounts given in the earlier, qualitative literature. This would only require per capita incomes in the Yangzi Delta to have been around 30 per cent higher than in China as a whole, which is broadly consistent with the scale of regional differences within China during the nineteenth century (Li and van Zanden, 2012; Yan, 2011; Rozman, 1973).

However, with the rise of Holland during its Golden Age, there are signs that the Great Divergence was already getting underway during the sixteenth and seventeenth centuries, since by this stage, the difference between the aggregates for China and Holland is too large to be bridged by regional variation. It may be argued that Holland was too small an area to be taken as evidence of a Great Divergence, but by 1700 the gap between Britain and China was also too large to be bridged by regional variation. It is worth noting that Pomeranz (2011) now accepts that his earlier claim of China on a par with Europe as late as 1800 was exaggerated, and he now settles for the earlier date of 1700, which seems to be broadly consistent with the data in Table 4 combined with a reasonable allowance for regional variation within China and India.

A key finding to emphasise from Table 4 is that Japan was following a similar trajectory to Britain and Holland, but at a much lower level, and with a slower rate of growth, so that Japan continued to fall behind the West until after the Meiji Restoration in 1868. This means that there was a Little Divergence within Europe led by the North Sea Area and a Little Divergence within Asia led by Japan. But since the frontier was moving out faster in Europe than in Asia, the Great Divergence between the two continents was also occurring.

3. EXPLAINING THE GREAT DIVERGENCE

The second way of accounting for the Great Divergence is to provide an explanatory framework. Armed with the estimates of economic growth before 1870 from Table 4, this paper now turns to explanation. A common framework of shocks and structural factors will be adopted for analysing the Little Divergences within Europe and Asia, as well as the Great Divergence between the two continents. The key shocks were the Black Death of the mid-fourteenth century, and the new trade routes that opened up from Europe to Asia and the

Americas around 1500. They had differential effects on different economies because of three structural factors: the extent of sectoral diversification; the nature of state institutions; and the quantity and quality of labour.

3.1 Sectoral diversification

Pre-modern growth was typically based on a terms of trade boom in a staple product such as wool, which was followed by a growth reversal. An increase in external demand would lead to a price increase, which would bring forth an increased supply. However, as the boom came to an end, the process went into reverse and a period of negative growth led to the wiping out of the previous gains, so that there was no trend in income. This can be seen clearly in Figure 1 in the cases of Italy and Spain throughout the period 1300-1870. A diversified sectoral structure could help to dampen growth reversals, by making the economy less dependent on the staple product. This diversification seems to have happened early in the cases of Britain and Holland.

The first aspect of a more diversified sectoral structure in the North Sea Area concerns the importance of livestock raising within a mixed arable and livestock farming, with the latter contributing a high share of agricultural value added. The data for England are shown in Table 5. In current prices the share of the livestock sector was already above 50 per cent after the Black Death, and was more than 60 per cent by the mid-fifteenth century. Although the share declined between the 1450s and the 1650s, much of this was due to an increase in the relative price of grain following the return of population growth. In constant 1700 prices, there was an upward trend in the share of the livestock sector, with just a gentle setback between the mid-fifteenth and mid-seventeenth centuries. To put things in

perspective, the livestock share of agricultural value added in India in the early twentieth century was around 20 per cent (Sivasubramonian, 2000).

The second way in which the North Sea Area had a more diversified sectoral structure can be seen in the lower agricultural share of the labour force in England and the Netherlands. Table 6 gives the share of agriculture in the labour force of selected European countries since the medieval period. Rising per capita incomes were strongly associated with declining shares of labour in agriculture. The growth of specialized industrial and service sectors can be seen to have proceeded faster in the Netherlands and England than in the rest of Europe. By 1600, the release of labour from agriculture had proceeded further in the Netherlands than in the rest of Europe, as the Dutch economy relied increasingly on imports of basic agricultural products such as grain and paid for them with exports of higher value added products (de Vries and van der Woude, 1997). By 1700, the share of the labour force engaged in agriculture was even smaller in England, where a highly commercialized agriculture produced enough grain to feed the population without recourse to substantial imports until well into the nineteenth century (Deane and Cole, 1967; Crafts, 1985). The share of the labour force in agriculture remained substantially higher in the rest of Europe.

3.2 Institutions and the role of the state

Work on the role of state institutions has tended in the past to be split between those emphasising the need to impose constraints on an over-mighty state and those who emphasise the need to build up state capacity to provide essential public goods. Acemoglu, Johnson and Robinson (2005) explain the success of Britain and Holland after 1500, together with the failure of Spain and Portugal, through institutional constraints on executive power. In Britain and Holland, constraints on rulers are seen as sufficient to ensure that rulers were unable to act arbitrarily in their dealings with merchants. In Spain and Portugal, by contrast, states are

characterised as being sufficiently powerful to prevent a strong merchant class from constraining their ability to intervene in business matters.

However, this view is countered by the work of Epstein (2000), who argues that state power was fragmented in the medieval period, with market integration hindered by the "freedoms" granted to interests such as towns and guilds, so that what was needed for growth was centralisation of state power and expansion of state capacity rather than constraints on the executive. This view is strengthened if we consider the importance of sectoral diversification, particularly the shift of labour out of agriculture. This required individual producers to be confident that they could maintain access to reliable supplies of food through the market as they left the land, and to retain the profits from their investments and innovations in non-agricultural activities. This confidence required a state with the capacity to enforce property rights, create a unified market and intervene during times of crisis. The formalised system of poor relief from the Elizabethan period, which encouraged English workers to remain in specialized non-agricultural occupations, had its origins in earlier developments at the local level, reaching back to the late-medieval period (Dyer, 2012) as well as the early Tudor period (Slack, 1988; Hindle, 2004, McIntosh, 2012). Solar (1995: 2-3) argues that from the seventeenth century the 'uniformity and comprehensiveness' of the English poor laws played an 'integral, and to a degree autonomous, part in England's economic development'. Such state institutions also required strong parliamentary control to prevent arbitrary interference in business.

The two views can be reconciled once it is recognised that a balance is needed between having a state that is strong enough to enforce property rights but not so strong that can it can appropriate all the gains from trade. Indeed, Dincecco (2011) argues convincingly on the basis of Europe's experience between 1650 and 1913 that what was needed for economic development was the establishment of a regime that was both fiscally centralised

and politically limited. Fiscal centralisation was needed to ensure that the state had sufficient capacity to provide public goods such as education and transportation infrastructure, while parliamentary control was necessary to ensure that the public revenues were spent effectively and that the state did not hinder the processes of private wealth creation.

There is empirical evidence to back up the importance of the expansion of both state capacity and parliamentary control in the European Little Divergence. Early modern Britain and Holland dominated Spain and Portugal in terms of both the ability of the state to raise taxes that allowed for an expansion of state capacity and the control exercised by mercantile interests over the state through parliament. Table 7 on the ability of the state to raise fiscal revenue per capita shows a pattern of divergence between northwest Europe and the rest of the continent during the seventeenth and eighteenth centuries, with England and the Dutch Republic forging ahead. Table 8 shows very different patterns of parliamentary activity in the North Sea Area and Mediterranean Europe from the twelfth to the eighteenth centuries. The index of parliamentary activity constructed by van Zanden, Buringh and Bosker (2012) is based on the calendar years per century in which parliament met. During the first half of the second millennium, Parliamentary activity was higher in Spain and Portugal than in the North Sea Area. However, activity then peaked in the fifteenth or sixteenth century in Spain and Portugal before going into decline. In the North Sea Area, by contrast, although parliamentary activity was slow to get going, it continued to increase after 1500, reaching very high levels during the seventeenth and eighteenth centuries.

Asian states are sometimes portrayed as more centralised and autocratic than European states, thus holding back Asian economic development (Jones, 1981; Landes, 1998). However, there is little evidence to suggest that the problem was one of Asian states

being too strong. In fact, it is easier to point to Epstein's (2000) problem of states being too weak to sustain integrated markets and support the trade needed to bring about prosperity. Parthasarathi (2011) makes this claim for India, and the work of Prange (2011) on the problems of piracy in the Indian Ocean supports the idea that merchants would have been better off with stronger states able to effectively enforce property rights. Data on fiscal revenue per capita in Table 8 suggest that China and India failed to keep up with northwest Europe in increasing fiscal capacity during the early modern period. Covering a longer span of history, Brandt, Ma and Rawski (2014: 67) suggest that China's per capita fiscal revenue had been on a downward trajectory since the Northern Song dynasty, falling to just 30 per cent of its Northern Song peak by the late Ming period. This decline of the fiscal state mirrors China's decline in per capita GDP. Data assembled by Sng and Moriguchi (2012) suggest substantially higher per capita tax revenue and provision of local public goods in Tokugawa Japan than in China between 1650 and 1850.

3.3 The quantity and quality of labour

Differences in both the quantity and quality of labour have received attention in the literature as a factor explaining the Great Divergence. Differences in the quantity of labour supplied by individuals have been used to explain the Little Divergence within Europe since Max Weber (1930) introduced the idea of the protestant ethic. However, it has now been secularised in the term "Industrious Revolution", widely associated with de Vries (1994), but actually coined by Hayami (1967) to describe developments in Tokugawa Japan. The basic idea is that people worked harder to obtain new goods made available by long distance trade and industrial innovation. As people worked more days per year, their annual incomes rose accordingly.

Following the Reformation, the number of holidays in Europe was reduced by around 50 per year, and during the Industrial Revolution, a further 50 holidays per year were removed as the practice of tolerating people not turning up for work on the first day of the week, known colloquially as St Monday, disappeared. Table 9 sets out the empirical evidence on annual days worked per person in England, drawing on a study by Allen and Weisdorf (2011). The length of the working year doubled from around 165 in the fifteenth century to around 330 in the nineteenth century. De Vries (2008: 87-92) discusses the less systematic evidence for other European countries, finding a similar pattern in the Netherlands but a slower elimination of saints' days in countries that remained catholic. Malanima's (2011: 203) calculation of the number of working days per year in Italy, using the marginal productivity theory of distribution, is consistent with this, yielding an average of 182 days per year between 1350 and 1820, but with an increase during the sixteenth century.

Hayami (1967) saw the Japanese industrious revolution during the Tokugawa period as underpinned by opportunities for women in protoindustrial work, particularly in the silk industry, and later in cotton textiles, in contrast to the labour market opportunities for European females in livestock agriculture (Voigtländer and Voth, 2010). Although Pomeranz (2000: 91-206) also argues for an industrious revolution in China, Huang (2002) views this as a misinterpretation of what he calls "involution". For Huang, Chinese over-population led to smaller landholdings, driving women to work in proto-industry just to remain at subsistence. Without the link to fertility through the age of first marriage for females, and the accumulation of human capital emphasised in the Japanese case by Saito (2012), working harder did not lead to long run economic development.

In the long run, however, what mattered more was the quality of the labour supplied by individuals, as human capital was accumulated. The North Sea Area had an advantage in this area because of its approach to marriage. Hajnal (1965) argued that northwest Europe had a different demographic regime from the rest of the world, characterised by later marriage and hence limited fertility. Although he originally called this the European Marriage Pattern, later work established that it applied only to the northwest of the continent. This can be linked to the availability of labour market opportunities for females, who could engage in market activity before marriage, thus increasing the age of first marriage for females and reducing the number of children conceived (de Moor and van Zanden, 2010). Later marriage and fewer children are associated with more investment in human capital, since the women employed in productive work can accumulate skills, and parents can afford to invest more in each of the smaller number of children because of the "quantity-quality" trade-off (Voigtländer and Voth, 2010). Development in northwest Europe was characterised by human- as well as physical-capital intensity (Baten and van Zanden, 2008). Part A of Table 10 summarises the results of a number of detailed local studies in the North Sea Area and Mediterranean Europe, reaching back to the sixteenth century. It suggests a relatively high age of marriage already by the early modern period in England and Holland. Although there was an upward trend in the age of first marriage for females in Italy and Spain, there was still a sizeable gap before the nineteenth century.

Part B of Table 10 presents similar data for Asia. Although the informational basis is weaker than in Europe, it does nevertheless point to marriage patterns playing an important role in the Asian Little Divergence. Although the female age of first marriage in China and India was much lower than in northwest Europe, Japan was an intermediate case, closer to the experience of England. The average age of first marriage for females was 22.1 in Tokugawa

Japan, compared with 25.4 in eighteenth century England, but 18.6 in late Ming and Qing China and just 13.0 in modern India.

3.4 The effects of the Black Death

The catching-up process of the North Sea Area with Mediterranean Europe and with China started with the arrival of the Black Death in the mid-fourteenth century. The same shock had different effects in different parts of Europe because of the way it interacted with structural features of the different economies. The classic Malthusian response to a mortality crisis is a rise in per capita incomes for survivors because of an increase in the per capita endowment of land and capital. As population recovers, however, there should then be a corresponding decline in per capita incomes, back to the pre-crisis levels. This is what happened in Italy. However, the outcomes were different in Britain and Holland, where the per capita income gains of the mortality crisis were sustained after the return to population growth from the mid-fifteenth century. The contrast between the outcomes in Britain and Holland on the one hand and Italy on the other hand are related to the structural characteristics outlined above. First, Britain and Holland had a diversified sectoral structure, with a large livestock component within agriculture, and a large share of the labour force working in industry and services. Second, Epstein (2000) attributes the different outcomes to differences in the role of the state. Whereas states in Italy were seen as fragmented, leading to low levels of market integration, states in the North Sea Area were seen as strong and centralised, leading to the provision of integrated markets. This has been borne out by recent empirical work on the degree of grain market integration in different parts of Europe, with Chilosi, Murphy, Studer and Tunçer (2013: 58) describing North Western Europe as standing out as "a beacon of integration already in 1620-1789". Third, the North Sea Area also had the benefit of a labour

force prepared to work more days per year and with more human capital as a result of a higher age of first marriage for females.

In the case of Spain, there was not even an initial increase in per capita incomes after the Black Death. Álvarez-Nogal and Prados de la Escosura (2013) explain this by the high land-to-labour ratio in a frontier economy during the Reconquest. Instead of reducing pressure on scarce land resources, Spanish population decline destroyed commercial networks and further isolated an already scarce population, reducing specialisation and the division of labour. Thus Spain did not share in the general west European increase in per capita incomes after the Black Death.

In Asia, there are no signs of a positive effect from the Black Death on per capita incomes, in contrast to Europe. This is not surprising in the case of Japan, which is known to have remained isolated from the Black Death. However, China is usually seen as the source of the Black Death, which spread to Europe via the Silk Road, and there was a large decline in China's population during the fourteenth century. However, it is not clear to what extent this mortality crisis was caused by plague rather than invasion and Mongol rule, since the evidential base for this period is relatively weak (Wilkinson, 2000: 862-878). Particularly in the early years of Mongol rule, hydraulic works were neglected, priority in land use was given to providing grazing for horses and many cities were destroyed (Maddison, 1998: 26; Perkins, 1969: 196-200). The destruction of the sophisticated institutional structures of the Northern Song dynasty reduced specialisation and the division of labour, so that per capita GDP declined. China's experience was therefore closer to that of Spain than to that of England or Holland.

3.5 The effects of the new trade routes

The reversal of fortunes within Europe pivots around 1500, when per capita incomes were approximately $1,500 in both Italy and Holland. The North Sea Area forged ahead after 1500, led initially by Holland during its Golden Age of the sixteenth and seventeenth centuries, and then by Britain during the Industrial Revolution. Economic historians have long pointed to long distance trade as playing an important role in this post-1500 Little Divergence, following the opening up of new trade routes to Asia around the south of Africa, and to the New World after Europe's encounter with the Americas. It might be expected that Spain and Portugal would have been the gainers from these changes, since they were the pioneers and both had Atlantic as well as Mediterranean coasts. However, as noted above, early modern Britain and Holland dominated Spain and Portugal in terms of institutional structures, including both the ability of the state to raise taxes to finance the expansion of state capacity and the control exercised by mercantile interests over the state through parliament (O'Brien, 2011; Karaman and Pamuk, 2010; van Zanden, Buringh and Bosker, 2012).

China adopted a restrictive closed door policy towards long distance trade after the "voyages to the western oceans" that had occurred between 1405 and 1433, which had shown China to be technologically ahead in shipbuilding (Fairbank, 1992: 137-140). However, following an initial period of openness to relations with European traders, Tokugawa Japan adopted a policy of *sakoku* or "seclusion" from the 1630s, so any Japanese advantage from the earlier Chinese turn inwards was short lived (Tashiro, 1982). Although recent work has tended to question the extent to which trade really was closed off by these policies, the contrast with the outward orientation of the European states which sponsored the voyages of discovery from the fifteenth century remains striking (van der Wee, 1990). With early

modern China and Japan turned inwards, India was the most open Asian economy, with its major export business in cotton textiles (Chaudhuri, 1978). However, this did not lead to Indian prosperity because of the low level of state capacity and its consequences for the enforcement of property rights (Prange, 2011; Parthasarathi, 2011).

4. CONCLUSIONS

This paper sets out to "account" for the Great Divergence between Europe and Asia, covering issues of both measurement and explanation. Dealing with measurement, there are a number of firm conclusions. First, the traditional view, in which the Great Divergence had late medieval origins and was already well under way during the early modern period, is confirmed. Second, however, revisionists are correct to point to regional variation within both continents. Third, there was a Little Divergence within Europe, with a reversal of fortunes between the North Sea Area and Mediterranean Europe. Fourth, there was a Little Divergence within Asia, with Japan overtaking China and India. Fifth, however, Japan started at a lower level of per capita income than the North Sea Area and grew at a slower rate, so continued to fall behind until after the Meiji Restoration of 1868.

The Little and Great Divergences are explained by the differential impact of shocks hitting economies with different structures. The main structural factors can be listed as follows. First, the degree of sectoral diversification mattered. The large share of livestock farming in agriculture and the early importance of non-agricultural employment contributed to the dampening of growth reversals in the North Sea Area. A more diversified economy was less vulnerable to terms of trade reversals in staple commodities. Second, state institutions were important in explaining the patterns of divergence within Europe and Asia as well as between the two continents. In the North Sea Area, state capacity was able to

expand, but at the same time merchants were able to exercise control over the state through parliamentary activity. Asian states exhibited no similar increase in state capacity. The growth of state capacity also helped with sectoral diversification, as a system of poor relief guaranteed access to food for those prepared to leave the land to take up opportunities in other sectors. Third, the quantity and quality of labour also mattered. This draws attention to some similarities between Japan and the North Sea Area, with de Vries (1994) taking Hayami's (1967) idea of an industrious revolution in Tokugawa Japan and applying it to northwest Europe. Also, the high female age of first marriage in northwest Europe led to lower fertility and more investment in human capital. Although female marriage was early in India and China, Japan was closer to the northwest European pattern.

There were two key shocks which interacted with the structural differences to produce the Little and Great Divergences. First, the Black Death led to a permanent upward shift of GDP per capita in the North Sea Area, which did not occur in the rest of Europe or Asia. Second, the new trade routes that emerged around 1500 accelerated the divergences. Whereas European states encouraged the voyages of discovery, in Asia China and Japan turned inwards. Although India remained open, it lacked state capacity, so this did not lead to Indian prosperity.

Much has already been achieved by applying a historical national accounting approach to the Great Divergence debate, but more research is still needed. First, historical national accounts are needed for more countries, reaching further back in time. Second, more regional disaggregation is needed within large countries. Third, much more work is needed to assemble systematic comparative data on potential explanatory variables. Fourth, more attention needs to be paid to the case of Japan, the first Asian country to achieve modern

economic growth, but which has been overshadowed in the Great Divergence debate by the focus on China.

TABLE 1: Maddison's estimates of GDP per capita in Western Europe and Asia, 1000-1870 (1990 international dollars)

	UK	NL	Italy	Spain	Japan	China	India
1000	400	425	450	450	425	466	450
1500	714	761	1,100	661	500	600	550
1600	974	1,381	1,100	853	520	600	550
1700	1,250	2,130	1,100	853	570	600	550
1820	1,706	1,838	1,117	1,008	669	600	533
1870	3,190	2,757	1,499	1,207	737	530	533

Sources and notes: Maddison (2010). The estimates are for countries within their modern boundaries, and hence cover the United Kingdom rather than Great Britain or England and the Netherlands rather than Holland.

TABLE 2: GDP per capita levels in Europe (1990 international dollars)

	England/ GB	Holland/ NL	Italy	Spain
1086	754			
1270	759			957
1300	755		1,482	957
1348	777	876	1,376	1,030
1400	1,090	1,245	1,601	885
1450	1,055	1,432	1,668	889
1500	1,114	1,483	1,403	889
1570	1,143	1,783	1,337	990
1600	1,123	2,372	1,244	944
1650	1,100	2,171	1,271	820
1700	1,630	2,403	1,350	880
	1,563			
1750	1,710	2,440	1,403	910
1800	2,080	2,617	1,244	962
		1,752		
1820	2,133	1,953	1,376	1,087
1850	2,997	2,397	1,350	1,144

Sources and notes: England/Great Britain: Broadberry, Campbell, Klein, Overton and van Leeuwen (2014); Broadberry and van Leeuwen (2011); Holland/Netherlands: van Zanden and van Leuwen (2012); Italy: Malanima (2011); Spain: Álvarez-Nogal and Prados de la Escosura (2013). Figures are for 10-year averages starting in the stated year (i.e. 1270-79, 1300-09,…) apart from 1348, which refers to the pre-Black Death years 1339-48.

FIGURE 1: Real GDP per capita in Italy and Spain 1270-1850 (1990 international dollars, log scale)
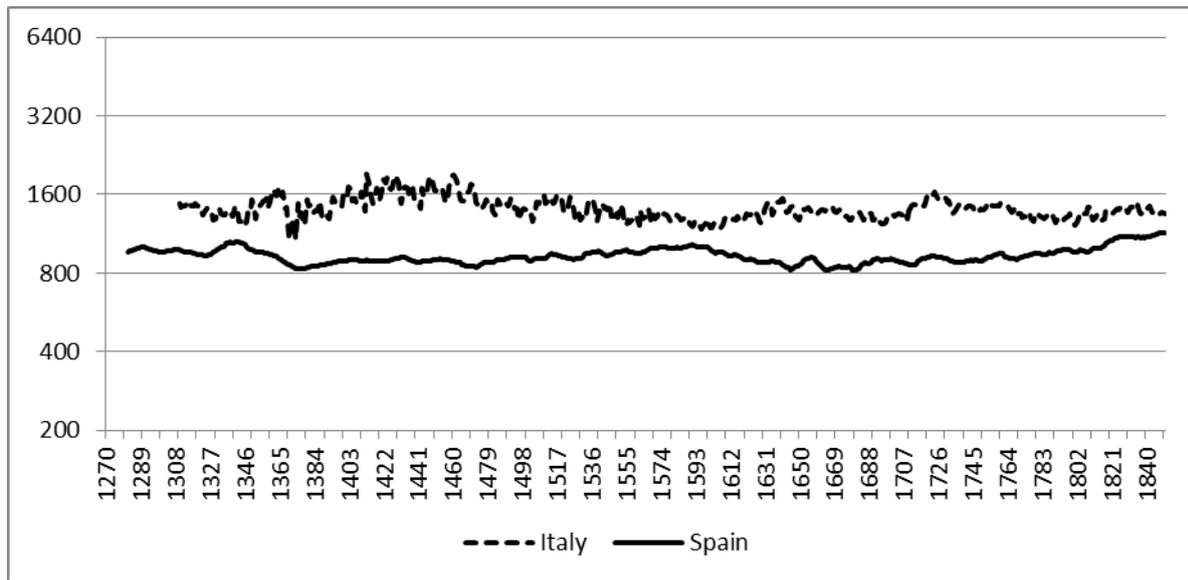
Source: Malanima (2011); Álvarez-Nogal and Prados de la Escosura (2012).

FIGURE 2: Real GDP per capita in Britain and Holland, 1270-1870 (1990 international dollars, log scale)
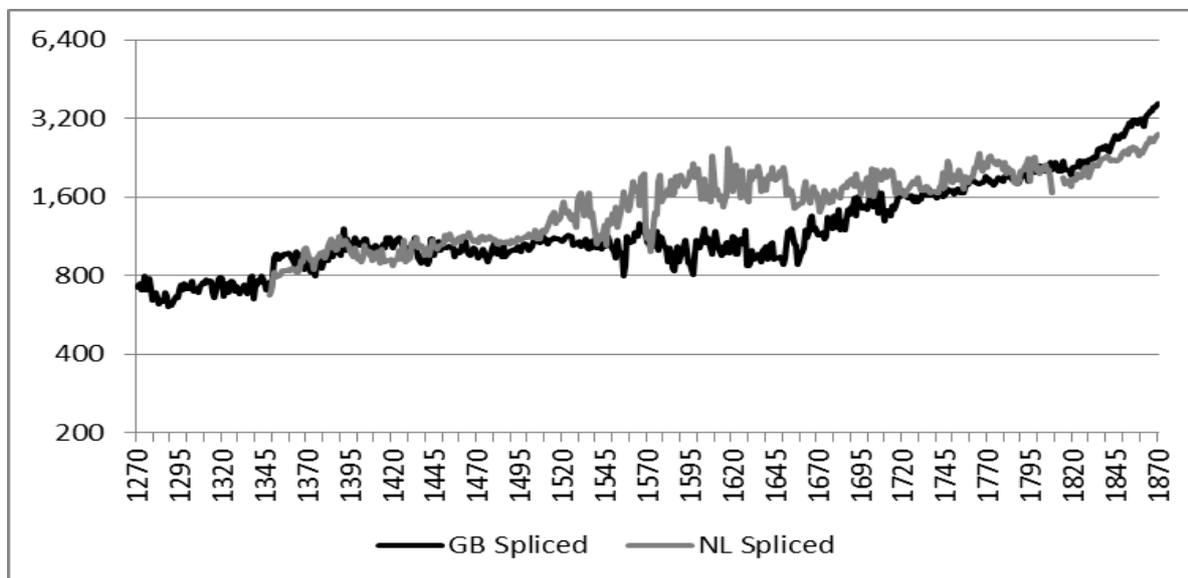
Source: Broadberry, Campbell, Klein, Overton and van Leeuwen (2014) and van Zanden (2012).

TABLE 3: GDP per capita levels in Asia (1990 international dollars)

	Japan	China	India
725	551		
900	476		
980		1,247	
1020		1,518	
1050		1,458	
1086		1,204	
1120		1,063	
1150	508		
1280	552		
1300			
1400		960	
1450	552	983	
1500		1,127	
1570		968	
1600	605	977	682
1650	619		638
1700	597	841	622
1750	622	685	573
1800	703	597	569
1850	777	594	556

Sources and notes: Japan: Basssino, Broadberry, Fukao, Gupta and Takashima (2014); China: Broadberry, Guan and Li (2014); India: Broadberry, Custodis and Gupta (2014); Chinese data are for 10-year averages starting in the stated year (i.e. 980-89, 1020-29,…), but data for Japan and India are only available for benchmark years.

TABLE 4: GDP per capita levels in Europe and Asia (1990 international dollars)

	England/ GB	Holland/ NL	Italy	Spain	Japan	China	India
725					551		
900					476		
980						1,247	
1020						1,518	
1050						1,458	
1086	754					1,204	
1120						1,063	
1150					508		
1280	679			957	552		
1300	755		1,482	957			
1348	777	876	1,376	1,030			
1400	1,090	1,245	1,601	885		960	
1450	1,055	1,432	1,668	889	552	983	
1500	1,114	1,483	1,403	889		1,127	
1570	1,143	1,783	1,337	990		968	
1600	1,123	2,372	1,244	944	605	977	682
1650	1,110	2,171	1,271	820	619		638
1700	1,563	2,403	1,350	880	597	841	622
1750	1,710	2,440	1,403	910	622	685	573
1800	2,080	1,752	1,244	962	703	597	569
1850	2,997	2,397	1,350	1,144	777	594	556

Sources: Tables 2 and 3.

TABLE 5: Share of the livestock sector in English agricultural value added, 10-year averages (%)

	At current prices	At constant 1700 prices
1270s	39.9	30.8
1300s	48.8	33.6
1350s	51.2	46.7
1400s	53.7	42.5
1450s	61.6	46.9
1550s	41.9	39.5
1600s	41.9	41.2
1650s	35.5	36.0
1700s	40.3	38.5
1750s	42.2	45.4
1800s	51.5	54.7
1850s	55.2	55.8
1860s	60.0	55.7

Sources: Broadberry, Campbell, Klein, Overton and van Leeuwen (2014).

TABLE 6: Share of agriculture in the European labour force (%)

	England	Netherlands	Italy	France	Poland
1300	--	--	63.4	--	--
1400	57.2	--	60.9	71.4	76.4
1500	58.1	56.8	62.3	73.0	75.3
1600	--	48.7	60.4	67.8	67.4
1700	38.9	41.6	58.8	63.2	63.2
1750	36.8	42.1	58.9	61.1	59.3
1800	31.7	40.7	57.8	59.2	56.2

Source: Derived from Broadberry, Campbell, Klein, Overton and van Leeuwen (2014); Allen (2000: 8-9).

TABLE 7: Per capita fiscal revenues, 1500/09 to 1780/89 (grams of silver)

	1500/09	1550/59	1600/09	1650/59	1700/09	1750/59	1780/89
Dutch Republic			76.2	114.0	210.6	189.4	228.2
England	5.5	8.9	15.2	38.7	91.9	109.1	172.3
France	7.2	10.9	18.1	56.5	43.5	48.7	77.6
Spain	12.9	19.1	62.6	57.3	28.6	46.2	59.0
Venice	27.5	29.6	37.5	42.5	46.3	36.2	42.3
Austria				10.6	15.6	23.0	43.0
Russia					6.3	14.9	26.7
Prussia			2.4	9.0	24.6	53.2	35.0
Ottoman Empire		5.6	5.8	7.4	8.0	9.1	7.1
Poland	1.5	0.9	1.6	5.0	1.2	0.8	11.2
China				7.0	7.2	4.2	3.4
India			11.1	17.4	21.9	17.6	5.5

Source: Europe: Karaman and Pamuk (2010: 611); China: Brandt, Ma and Rawski (2014: 69); India: derived from Broadberry, Custodis and Gupta (2014).

TABLE 8: Activity index of European parliaments, 12th to 18th centuries (calendar years per century in which parliament met)

	_12th_	_13th_	_14th_	_15th_	_16th_	_17th_	_18th_
North Sea Area							
England	0	6	78	67	59	73	100
Scotland	0	0	10	61	96	59	93
Netherlands	0	0	0	20	80	100	100
Mediterranean							
Castile and Leon	2	30	59	52	66	48	7
Catalonia	3	29	41	61	16	14	4
Aragon	2	25	38	41	19	11	1
Valencia	0	7	28	29	12	4	0
Navarre	2	7	17	33	62	30	20
Portugal	0	9	27	47	12	14	0

Source: van Zanden, Buringh and Bosker (2012: online appendix S1).

TABLE 9: Annual days worked per person in England

Period	Blanchard/Allen and Weisdorf	Clark and van der Werf	Voth
1433	165		
1536	180		
1560-1599		257	
1578	260		
1584	210		
1598	259		
1600-1649		266	
1650-1699		276	
1685		312	
1700-1732		286	
1733-1736		295	
1760			258
1771		280	
1800			333
1830			336
1867-1869		293-311	
1870		318	

Sources and notes: 1433-1598: derived by Allen and Weisdorf (2011: 721) from Blanchard (1978: 24) as the number of days worked in agriculture (135) plus the share of the remaining130 workdays spent in mining; 1560-1599 to 1870: Clark and van der Werf (1998: 838); 1760-1830: Voth (2001: 1078).

TABLE 10: Female age of first marriage

A. Northwest Europe

	16th century		17th century		18th century		19th century	
	mean	n	mean	n	mean	n	mean	n
England	24.8	3	25.7	66	25.4	110	24.4	48
Netherlands	--		25.2	2	27.1	11	26.4	12
Italy	19.5	8	21.6	31	22.7	72	24.0	94
Spain	19.3	2	20.3	2	23.7	26	23.9	4

B. Asia

	Period	Range	Mean
Japan	1680-1860	18.8 to 24.6	22.1
China	1550-1931	17.2 to 20.7	18.6
India	1911-1931	12.9 to 13.3	13.0

Sources and notes: Part A: derived from Dennison and Ogilvie (2013); n is the number of local communities included in the study and mean is the unweighted average. Part B: Mosk (1980: 476); Lee and Wang (1999: 67); Bhat and Halli (1999: 137); mean is the unweighted average.

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