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REGIONAL VARIATION AND THE ASIAN LITTLE DIVERGENCE

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Abstract: Comparing the major Asian economies of China, India and Japan without taking account of variations in size suggests that the Asian Little Divergence began in the eighteenth century when Japan overtook first India and then China. However, the Great Divergence debate has focused on when the leading regions of the declining countries first fell behind and there was significant regional variation in GDP per capita in all three countries. Allowing for regional variation significantly changes the dating of the Asian Little Divergence: (1) In China, the Yangzi Delta, with a population about the same size as the whole of Japan, did not fall behind until around the time of the Meiji restoration in 1868. (2) In Japan, the Kinai region forged ahead of the Yangzi Delta around 1800. (3) In India, Mysore remained behind the Yangzi Delta throughout the period 1600-1870 and therefore has less significance for the timing of the Asian Little Divergence.

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1. INTRODUCTION

There has recently been much progress in the quantification of Asian economic history, stimulated particularly by the debate over the Great Divergence of productivity and living standards between Asia and Europe. Alongside this global debate about when Europe first forged ahead of Asia, there has also been a controversy over the European Little Divergence, which has stimulated further quantitative work on historical national accounting for individual European economies. This has clarified the parameters of the reversal of fortunes between the northwest and Mediterranean regions of Europe. Within Asia, there has been some debate about the reversal of fortunes between China and Japan, since China has often been characterized as the world's productivity leader at the start of the second millennium, but it was Japan that made the first Asian breakthrough to modern economic growth in the late nineteenth century and went on to attain western living standards in the twentieth century. There have also been attempts to portray parts of India as on a par with the leading European nations until the nineteenth century. This raises a number of questions about the Asian Little Divergence, for which this paper attempts to provide some quantitative answers.

We begin with a comparison of national economies, without for the moment taking into account differences in population size. Recent developments in historical national accounting enable us to compare China and Japan from the beginning of the second millennium. Taken at face value, this suggests that the Asian Little Divergence began in the eighteenth century when Japan pulled ahead of China. Estimates of Indian GDP per capita are also available from 1600 and suggest that Japan also overtook India in the eighteenth century, a couple of decades before overtaking China.

However, one of the most important findings of the Great Divergence debate was the need to take account of size differences when comparing Asian and European states. Whereas Chinese population in 1600 was 160 million, the populations of the leading northwest European economies of England and the Netherlands were 4.3 million and 1.5 million, respectively. In such circumstances, there could easily have been a Chinese region of a similar size to a European nation state that was still on a par with the most developed parts of Europe until the beginning of the nineteenth century. For Pomeranz (2000) this was the Yangzi Delta with a population of 20 to 30 million during the late Ming and Qing dynasties, comparable to that of France, Europe's largest nation state. In this paper, we are applying the same logic to intra-Asian comparisons of per capita incomes. Starting with the comparison between China and Japan, it turns out that the population of Japan was about the same as the Yangzi Delta. Thus the natural comparison is between the Yangzi Delta and the whole of Japan. The effect of this is to delay the Asian Little Divergence until around the time of the Meiji restoration of 1868, compared with the mid-eighteenth century using the aggregate data for both China and Japan.

It is nevertheless interesting to examine regional variation within Japan, which was the first Asian economy to achieve modern economic growth and went on to attain western levels of GDP per capita during the second half of the twentieth century. To what extent do we see signs of these developments in the patterns of regional economic performance in Japan during the Tokogawa Shogunate? It is certainly possible to construct a "Japan leader" series from West Tōhoku in the eighteenth century, East Tōhoku from the first half of the nineteenth century and Kinai from the third quarter of the nineteenth century. This suggests that Japanese overtaking of the Yangzi Delta occurred shortly after 1800, rather than only after 1874. However, none of these regions was of comparable size to the Yangzi Delta and the lack of consistency in the leading region is not suggestive of the steady build-up of a dominant cluster. Nevertheless the Kinai region, containing the ancient capital Kyoto as well as the major port city of Osaka, was close to the frontier by the beginning of the nineteenth century, emerged as Japan's GDP per capita leader by 1874 and has remained a high-GDP per capita region since then. However, the West Kantō region, containing the modern capital Tokyo, was fast catching up during the Tokugawa Shogunate and would emerge as the dominant region during the twentieth century.

There is no available overview of the regional distribution of per capita incomes across the whole of India. Nevertheless, there are two sub-national studies of GDP per capita in India for the regions of Mysore in the south and Bengal in the north. Sivramkrishna (2009) uses data from Buchanan (1807) to suggest that GDP per capita in Mysore was on the same level as in northwest Europe at the beginning of the nineteenth century, which is considerably higher than in the Yangzi Delta and would make Mysore the Asian GDP per capita leader. As we shall see, however, Sivramkrishna's estimates are biased upwards, and Nagar (2024) provides adjusted estimates that suggest that although Mysore was richer than India as a whole, and also richer than Bengal, it lagged behind the leading regions of both China and Japan. In the current state of knowledge, the Asian Little Divergence therefore remains a reversal of fortunes between China and Japan, even taking account of regional variation.

2. COMPARING NATIONAL ECONOMIES

There have been a number of studies over the last decade or so which have attempted to measure GDP and population for Asian economies with a view to comparison with European economies to shed light on the timing of the Great Divergence. We begin our analysis with a study of these economies, focusing on GDP per capita in China, Japan and India over the period 1000-1870, leaving the analysis of regional variation for later sections.

2.1 Chinese data

The data for China are taken from Broadberry, Guan and Li (2018; 2021), who reconstruct GDP from the output side and combine this with population data to derive GDP per capita. These estimates draw on three main types of evidence. First, the official historical literature was part of a long imperial tradition of recording history to provide experience and lessons in national governance for future dynasties. Second, there were private historical works by renowned scholars which sometimes recorded important economic data based on investigative research by the authors. Third, local gazetteers were area records which often provided useful information on industries, particularly where they were concentrated regionally.

GDP was reconstructed from the output side, dividing the economy between agriculture, industry and services. Agricultural output was estimated mainly from data on the amount of agricultural land cultivated, multiplied by crop yields per unit of land. The cultivated land area estimates rest ultimately on official data but have also been adjusted in line with data gleaned from contemporary gazetteers and private histories, as well as the work of more recent economic historians such as Perkins (1969), Chao (1986) and Shi (2017). Grain yields have been collected from official sources and gazetteers, and care has been taken to obtain regionally representative samples. Of particular importance here is the difference between the higher yields of rice in southern Chinese paddy farming compared with wheat yields in the dry farming areas of the north. The recent estimates of Shi (2017) for the Qing dynasty represent a particular advance in the geographic coverage and the number of data points.

Industry is divided into four main sectors: metals and mining; food processing; textiles and other manufacturing; and building. The basic approach is to obtain indicators of the volume of output in each main branch of industry and to aggregate these into an index of industrial production using value added weights for the benchmark year of 1840. The output of the metals and mining sector is tracked using volume data for iron, copper and salt, taken largely from official sources, supplemented by information from gazetteers and private historical sources, particularly where an industry was regionally concentrated. Food processing is assumed to grow in line with agricultural output, following the approach of Broadberry, Campbell, Klein et al. (2015) for England. Building is assumed to grow in line with population, but with an allowance for urbanization, since the growth of towns was associated with more building. This also follows the procedure of Broadberry, Campbell, Klein et al. (2015) in the estimation of English economic growth, 1270-1700. The textile industry, which is taken as representative of other manufacturing, is assumed to grow in line with population, consistent with evidence on cloth consumption per capita (Li, 2005; Xu, 1992).

The service sector is broken down into three subsectors: commerce; government; and housing and domestic services. Volume indicators are used to construct real output indices for each subsector. The output of the commercial sector is estimated as a weighted average of the volume of agricultural and industrial goods to be distributed, with the weights taking account of the lower proportion of agricultural output being distributed due to own-consumption of food produced by peasants. For government services, the value of output is calculated from the numbers of civil servants and soldiers and their salaries, derived from official sources, deflated by the overall price index to obtain the real value of government services. It is assumed that housing and domestic service grew in line with population, again with an allowance for urbanization, as for the building sector.

The population estimates for the Ming and Qing dynasties are based ultimately on Liu and Hwang (1979), who interpolated the benchmark estimates of Perkins (1969) to provide a continuous decadal series, although some minor adjustments have been incorporated following the work of Maddison (1998).

2.2 Japanese data

The Japanese data are taken from Bassino, Broadberry, Fukao et al. (2015), based on a reconstruction of GDP from the output side. Agricultural output was estimated directly from the supply side using data on crops harvested or the amount of land used for crop production multiplied by crop yields. For the ancient period (730-1192) and the medieval period (1192-1600) agricultural output was derived from data on arable land in use multiplied by land productivity, while for the Tokugawa period (1600-1868), the most reliable data are for agricultural production and land use, with land productivity derived from these two series. These supply side estimates can then be cross-checked against estimates of the demand for food derived indirectly from data on population, wages and prices. Although the supply side estimates cover a long span of time, they are available only at a relatively low frequency. By contrast, the demand side estimates are available at higher frequency, but covering a shorter span of time. Fortunately, both supply and demand estimates suggest similar long run patterns.

The share of the population living in towns is often used as a measure of the non-agricultural sector, but Saito and Takashima (2016) point out that this is problematic when applied to the case of Japan because urbanization rates declined during the late Tokugawa period, widely seen as a period of proto-industrial growth. Just using urbanisation rates would thus miss the expansion of cottage industry in the rural industrious revolution highlighted by Hayami (1967). The solution of Saito and Takashima is to allow secondary and tertiary sector output to vary with population density as well as the urbanisation rate. Population density continued to rise during the late Tokugawa period when urbanisation rates declined.

Japanese population data are assembled, cross-checked and made consistent from a range of studies establishing population for benchmark years covering the ancient, medieval, Tokugawa and early Meiji periods. For the ancient period, 710-1192, the population size is derived from estimates of the number of villages multiplied by average village size or the cultivated area divided by the amount of land needed to provide sufficient food for one person (Farris, 2009). For the medieval period, 1192-1600, the population is estimated either from the cultivated area and the amount of land needed to feed one person, as in the ancient period, or from the number of soldiers multiplied by estimates of the ratio of soldiers to the rural population, with an adjustment to allow for the urban population (Farris, 2006; Saito and Takashima, 2017). For the Tokugawa period, 1600-1868, benchmark estimates are based on the first national census for 1721 and further national surveys during the nineteenth century (Kito, 1996). For the final benchmark year during the early Meiji period, the population of 1874 is taken from Fukao, Bassino, Makino et al. (2015).

2.3 Indian data

The Indian data from Broadberry, Custodis and Gupta (2015) cover the period 1600-1871 and refer to the territory of the Indian sub-continent, including Pakistan and Bangladesh as well as modern India. The starting point is the estimation of population, which is used to derive domestic demand for goods and services, as well as to provide the denominator for the series of GDP per capita. The population series is anchored to the first full census of India, which was conducted non-synchronously between 1867 and 1872 and is usually presented as the first decennial census for 1871. Data for the period 1801-1871 are taken from Mahalonobis and Bhattacharya (1976), who assembled information collected by the British for the three Presidencies of Bengal, Madras and Bombay, and supplemented this with assumptions about the rate of population growth in the non-enumerated areas. For earlier years, Broadberry, Custodis and Gupta (2015) drew on the estimates collected together by Visaria and Visaria (1983: 446), based on evidence that is mostly regional and incomplete. Given the hybrid nature of the series projected back from the 1871 benchmark, it is useful that Habib (1982: 164-166) provides a cross-check for the absolute population level in 1600 on the basis of three alternative methods of estimation using the cultivated area, land revenue and army size.

In agriculture, the demand approach makes use of data on wages and prices as well as the population estimates. Dividing the wage by the price of grain yields the grain wage and the assumption of an income elasticity of demand for food of 0.4 is used to estimate the per capita demand for food. This is then multiplied by the population to arrive at the domestic demand for food, which is supplemented by data on agricultural exports. In a final step, the agricultural demand series is extended to 1910 and cross-checked against the growth of the grain supply between 1600 and 1910, using data on the cultivated area and grain yields from Moosvi (1987) and Department of Revenue (1912).

For industry, the demand approach makes use of data on wages and cloth prices to derive the cloth wage. The income elasticity of demand for cloth is set at 0.5 to be consistent with changes in the per capita demand for cloth during the nineteenth century from Roy (2012). However, imports of cloth have to be subtracted from aggregate domestic demand to obtain output for the domestic market. As in agriculture, it is necessary to add exports to domestic output to obtain a series for overall industrial output. The main sources of export data are the data on textile exports to Britain from Chaudhuri (1978) and Bowen (2007). Although data are not available for exports to other countries, it is possible to make an allowance for the changing share of Britain as an export destination using data on regional shares of bullion inflows to India from Haider (1996: 323).

For the services sector, private services are assumed to grow in line with the urban population from Habib (1982: 166-171) and Visaria and Visaria (1983: 519), while the size of government is incorporated using data on tax revenue for the Mughal Empire to 1750 and British India thereafter. The indices for sectoral output are aggregated together using value added weights for 1900/01 from Sivasubramonian (2000), projected back to 1871 using changes in employment structure.

2.4 The timing of the Asian Little Divergence using national data

For international comparisons, it is necessary to convert GDP per capita series for each country to a common currency. Most long run studies compare GDP at purchasing power parity (PPP) for a benchmark year of 1990. The PPPs for 1990 are obtained from a major study for most countries in the world conducted by the International Comparison Program (ICP), managed by the World Bank. The World Bank poverty standard in 1990 was $1 per day, or $365 per year, and since any society always contains a rich elite, Maddison (1995) took a per capita income of $400 per year as "bare bones subsistence".

Figure 1 sets out the data on GDP per capita for the three large Asian economies of China, Japan and India, all shown in 1990 international dollars. This suggests that China was a long way above bare bones subsistence during the Song dynasty with a peak per capita GDP of over $1,000 or two-and-a-half times subsistence, then remained at a high level during the Ming dynasty before declining sharply during the Qing dynasty to around $600 or one-and-a-half times subsistence. Japan, by contrast, was relatively poor in the period 1000-1500 with per capita GDP less than $600, but began to improve its position during the Tokugawa Shogunate and had climbed above $1,000 by the time of the Meiji restoration. India was in decline from

1600 onwards, with GDP per capita falling from around $700 in 1600 to little more than $500 by the late nineteenth century.

The national data thus suggest that at the beginning of the second millennium, China was richer than Japan, but that a reversal of fortunes occurred during the eighteenth century as Japan forged ahead of China in the late Tokugawa period, so that a substantial gap had opened up by the time of the Meiji restoration in 1868. The Indian GDP per capita data also suggests a reversal of fortunes with Japan, but with Japan forging ahead already by the early eighteenth century. The eighteenth century thus appears to be a critical juncture in the Asian Little Divergence. However, this takes no account of the substantial differences in size between the three countries. In 1600 the population of China was 160 million, compared with 17 million in Japan and 142 million in India (Broadberry, Guan and Li, 2021; Bassino, Broadberry, Fukao et al., 2019; Broadberry, Custodis and Gupta, 2015). Since Japan emerged as the leading Asian national economy in the eighteenth century, but was much smaller than China and India, we need to consider whether there might have been regions within China and India that might have remained on a par with Japan until the nineteenth century. And since Japan went on to achieve western levels of GDP per capita in the twentieth century, it will also be important to consider what was happening in the leading Japanese regions.

3. REGIONAL VARIATION WITHIN CHINA

Broadberry, Guan and Li (2018, 2021) made the first attempt to provide estimates of GDP per capita in the leading region of China over a substantial period of time, derived by assuming that the ratio between the Yangzi Delta and China as a whole in the 1820s remained constant over time. The ratio for the 1820s was obtained from a comparative study by Li and van Zanden (2012), who found per capita incomes in the Yangzi Delta to be around half of the level in the

Netherlands in the 1820s. This suggests a per capita GDP figure of around $1,050 for the Yangzi Delta, in 1990 international dollars, or about 75 percent higher than in China as a whole. Applying the ratio between the Yangzi Delta and China as a whole in the 1820s to Chinese GDP per capita from Broadberry, Guan and Li (BGL) for earlier years produces a quantification of the leading Chinese region in the same units as the other countries in Figure 1. This does not have to mean that the Yangzi Delta was always the leading region, but rather that there was always a region that was proportionally as far above the Chinese average as the Yangzi region in the 1820s. This is plotted in Figure 2 as the China leader (BGL) series.

Broadberry and Guan (2022) provide estimates of Chinese GDP per capita for four benchmark years, broken down into seven macro regions during the Ming and Qing dynasties, with the Yangzi delta also shown as a sub-region of East Central China and Kaifeng Fu as a sub-region of Northern China. These estimates are reproduced in Table 1. The reason for the inclusion of the Yangzi Delta, apart from its central importance in the Great Divergence debate, is that the East Central region was China's richest region during the Ming and Qing dynasties but still contained around a third of China's population, so much larger than any European state or Japan. It is thus necessary to move to a smaller sub-region and also provide data for the Yangzi Delta, the core of East Central China. With a population of around 20 million in 1600, about the same as France, the Yangzi Delta is more comparable in size to a European nation state and also Japan. For the Northern Song dynasty, although it is not possible to derive a full regional breakdown, data are provided for Kaifeng Fu, the region containing the capital city. Broadberry and Guan's (2022) benchmark estimates are broadly consistent with the time series projections of Broadberry Guan and Li (2021), which hold constant the ratio between GDP per capita in China's leading region and the empire as a whole.

A number of findings stand out clearly from Table 1. First, from the Ming to the Qing dynasty, the Yangzi Delta was the richest Chinese region, with GDP per head more than three times the subsistence level during the Ming dynasty and still two-and-a-half times subsistence during the Qing. Second, GDP per capita remained well above subsistence in most of central and southern China, buoyed up by the high grain yields from paddy farming. Third, however, GDP per capita was much closer to subsistence in northern and northwestern China, where dry farming resulted in low yields which were only partially offset by higher land-labour ratios than in the south. Fourth, Kaifeng Fu exhibited very high GDP per head during the Northern Song dynasty, largely as a result of very high levels of urbanisation.

Zhai's (2023) reconstruction of GDP per capita from the output side in the Yangzi Delta uses a similar methodology to Broadberry, Guan and Li (2018; 2021) but applied at the regional level using local sources such as gazetteers. Figure 2 compares Zhai's (2023) estimates of GDP per capita for the Yangzi Delta with the alternative estimates from Broadberry, Guan and Li (2021) and Broadberry and Guan (2022). Zhai's results are broadly consistent with the BGL and B&G estimates over the period 1400-1870. For the rest of the paper we will focus on Zhai's (2023) estimates for the Yangzi Delta during the Ming and Qing dynasties, combined with Broadberry and Guan's (2022) benchmark estimate for Kaifeng Fu during the Northern Song dynasty.

The main effect of allowing for regional variation within China is to postpone the reversal of fortunes between China and Japan until after the Meiji restoration. This can be seen in Figure 3, which compares Zhai's (2023) series for the Yangzi delta and Broadberry and Guan's benchmark for Kaifeng Fu with the aggregate series for Japan. We have already seen that the Yangzi Delta was of comparable size to the whole of Japan, and although the population of Kaifeng Fu was smaller than that of Japan at the beginning of the second millennium – 1.3 million versus 5.0 million – the scale of the per capita income difference was extremely large compared with during the nineteenth century, so that there can be no doubt about China's per capita GDP leadership during the Northern Song dynasty.

4. REGIONAL VARIATION WITHIN JAPAN

We now explore regional variation within Japan, to see how that might affect the timing of the Asian Little Divergence. The data on GDP per capita in Japanese regions are set out in Table 2 in1990 international dollars. The first seven regions make up Eastern Japan, with West Kantō containing the modern capital city of Tokyo, while Western Japan consists of the last seven regions, with the ancient capital city of Kyoto contained in Kinai. The data are derived from Takashima (2017) and Saito and Takashima (2016), following the method set out in Fukao, Bassino, Makino et al. (2015). Estimates of primary sector output are first taken from Takashima (2017: 140), measured in *koku*.[1] The secondary and tertiary sector GDP are then estimated using equations (5) and (6) from Saito and Takashima (2016: 380) taking account of variation in population density and urbanization rates across regions as well as over time. The urbanization rate is often used to capture the share of secondary and tertiary output, but misses any elevated share associated with rural proto-industry, which is captured by the density of population. GDP per capita is obtained by aggregating primary, secondary and tertiary output and dividing GDP by population, also obtained on a regional basis from Takashima (2017: 166).

In Table 2, we see that in the early eighteenth century neither Kinai nor West Kantō had

[1] Under the *kokudaka* system of the Tokugawa shogunate, lands were valued for taxation purposes in terms of their capacity for producing rice, expressed in *koku*, with one *koku* approximately equal to 150 kg.

per capita GDP above the average for Japan, while West Tōhoku and South Kyūshū were the richest regions in Eastern and Western Japan, respectively. By the early nineteenth century, however, both Kinai and West Kantō enjoyed above-average per capita GDP, with Kinai having emerged as the clear leader by the late nineteenth century. After the Meiji restoration, the capital city moved to Edo - which was renamed Tokyo – in West Kantō. To construct a per capita GDP leader series for Japan involves starting with West Tōhoku in 1721, before moving to East Tōhoku for 1804 and 1846 and to Kinai in 1874. This is plotted together with the Yangzi Delta series for China in Figure 3. Using the Japan leader series therefore moves the dating of the Asian Little Divergence from the late nineteenth century to the early nineteenth century. However, it should be noted that the population of Kinai during this period was between 2 and 3 million, compared with 20 to 30 million in the Yangzi Delta. Even including the area "around Kinai" gives a total population figure for the "greater Kinai" region of only 6 to 7 million. Allowing for regional variation within Japan therefore cannot have the same effect on the timing of the Asian Little Divergence as regional variation within China.

5. REGIONAL VARIATION WITHIN INDIA

The long run data on regional variation within India are much scarcer than for both China and Japan. Nevertheless, there have been two sub-national studies of GDP per capita in India based on welfare ratios for benchmark years. Sivramkrishna (2009) estimated welfare ratios for Mysore in southern India using data on wages and prices extracted from Francis Buchanan's (1807) *Journey through the Countries of Mysore, Canara and Malabar*, conducted during 1800-1801. Roy (2010) used the income of government to infer the income of the population for Bengal in the second half of the eighteenth century.

5.1 GDP per capita in Mysore

Allen (2001) introduced the idea of welfare ratios, which are obtained by dividing an annual wage for a well-defined occupation by the cost of a basket of goods consumed by a representative household. Most authors follow Allen in estimating welfare ratios for precisely-defined occupations to compare living standards of unskilled and skilled workers across countries. However, Sivramkrishna (2009) used them for a wide range of occupations and went on to construct an aggregate welfare ratio, which approximates a measure of GDP per capita constructed from the income side. Sivramkrishna reported an aggregate welfare ratio (or proxy estimate of GDP per capita) for Mysore in 1800/01 of 4.87, shown here in Table 3. GDP per capita in northwest Europe at this time was around $2000 in 1990 international prices in both Britain and the Netherlands. The World Bank's poverty line in 1990 was $1 per day, or $365 per year, but since every society has a rich elite, Maddison (1995) worked with $400 as the subsistence level of GDP per capita. This yields a "GDP per capita welfare ratio" of around 5 for Britain and the Netherlands in 1800/01. According to Sivramkrishna, therefore, GDP per capita in Mysore was about the same as in the richest region of Europe at the beginning of the nineteenth century, and nearly twice as rich as the Yangzi Delta in China. However, there are good reasons to think that Sivramkrishna's estimates are biased upwards.

Sivramkrishna (2009: 711-715) collected 70 observations of wages for a range of occupations. He then divided these wage estimates by the cost of a version of Allen's (2009) subsistence basket, based on ragi, or finger millet, a low quality grain (Sivramkrishna, 2009: 710). As Nagar (2024) points out, however, these welfare ratios do not suggest a particularly high standard of living, with an unweighted average of 1.44. The high aggregate welfare ratio results from high welfare ratios for agricultural cultivators, industrial proprietors and merchants, based on a much smaller number of observations, combined with a peculiar occupational structure based on Buchanan's assessment of the occupational distribution for

Kanara (Sivramkrishna, 2009: 723-724). The occupational distribution is based on data for Kanara, the coastal region of the present state of Karnataka, which has a very different geography from inland Mysore. One worrying distortion here is the inclusion of 14 per cent of the population as "extractors of palm juice" in an area where palm trees are rare, while the allocation of 23.5 per cent of the population to the category of "others" with a welfare ratio of zero to account for the non-earning population implies a relatively high participation rate of 76.5 per cent. However, the biggest problems arise from the class distribution of people engaged in the agricultural and industrial sectors.

In agriculture, which accounted for half the population in 1800, Sivramkrishna found that agricultural labourers and servants had welfare ratios (Rg) less than one, but together account for just 15 per cent of the population. The other 35 per cent of the population engaged in agriculture consisted of small, medium and large cultivators who didn't earn wages but had much higher welfare ratios of 2.9, 7.68 and 15, respectively. Although these are based on the incomes of particular farmers, they were not selected to be representative and it seems likely that Buchanan's sample is biased towards the rich. In industry and commerce, which accounted for 26.5 per cent of the population, wage earners made up just 0.5 per cent of the population, with an average welfare ratio of 1.635. The average welfare ratio of the numerous extractors of palm juice was substantially higher at 5.63, while that of the industrial proprietors was even higher at 8.5.

Nagar (2024) shows that Sivramkrishna's results are very sensitive to assumptions about the class distribution of the population within both industry/commerce and agriculture. Sivramkrishna seems to have inverted the pyramid within industry so that 12 per cent of the population were industrialists and only 0.5 per cent were workers, yielding a ratio of 24 capitalists to each worker. In agriculture, large cultivators were a rural elite with very high incomes, but it seems highly unlikely that they represented as much as 9 per cent of the population, while both large and medium cultivators required many servants to work their land, and yet with Sivramkrishna's assumptions there was less than half a servant per farm. Nagar suggests increasing the number of agricultural servants to 33 per cent and reducing the number of cultivators to 16 per cent, with the large farmers down to 4 per cent and the medium farmers to 8 per cent, so that there were almost 3 agricultural servants per farm.

With this occupational distribution in Table 4, the ragi welfare ratio declines to 2.31. Taking subsistence GDP per capita as $400, this welfare ratio would correspond to GDP per capita in 1990 international prices of $924, or about half of the northwest European level. Broadberry, Custodis and Gupta (2015) report GDP per capita for India as a whole in 1800 as $569, so the ragi welfare ratio implies that GDP per capita in Mysore was 62.4 per cent higher than in India as a whole, which is broadly comparable to the scale of the Yangzi Delta's advantage over China as a whole.

The population of Mysore in the nineteenth century is not straightforward to establish before the first census data for 1872. Buchanan (1807: iii.417) gave the number of houses in the territories belonging to the Raja of Mysore in 1800 as 495,420. Using Buchanan's multiplier of 5 persons per house, this yields a total population of 2.5 million, which would imply an average annual growth rate of nearly 1 per cent to reach the census level of 5 million by 1872, at a time when the Indian population as a whole was growing at only 0.3 per cent per year (Mitchell, 1982: 63; Broadberry, Custodis and Gupta, 2015: 61). Buchanan (1807: iii.415) clearly did not have a lot of faith in the source of the data, the *Caneh Sumareh of the Mysore Rájá's* dominions, noting that "due attention is neither paid to cast nor possession; nor can great reliance be placed on the accuracy of its statements". A better estimate of the population of Mysore in 1800 may therefore be of the order of 4 million, corresponding to a growth rate of 0.3 per cent between 1800 and 1872. Although this is substantially smaller than the population of the Yangzi Delta at the time (27.6 million), it is larger than the population of Kinai in Japan (2.4 million) and somewhere between England (8.7 million) and the Netherlands (2.1 million) in northwest Europe, and is therefore suitable for comparison with the leading regions of these countries (Zhai, 2023: 195; Takashima, 2017: 166; Wrigley and Schofield, 1981: 534; Smits, Horlings and van Zanden, 2000).

5.2 GDP per capita in Bengal

Roy (2010) sought to estimate GDP per capita for Bengal in 1763 by reconstructing incomes in the agricultural and manufacturing sectors. Table 5 sets out the method. In agriculture, gross output is derived from tax revenue by dividing the latter by the tax rate. The tax revenue delivered to the treasury was Rs 25.6 million and although the overall tax rate paid by the peasants to the landlords was of the order of 40 per cent of agricultural gross output, the landlords retained much of this for themselves, so that only 8 per cent was delivered to the treasury. Hence 8 per cent is the tax rate used in the calculation to convert the recorded tax revenue into agricultural output.[2] Roy (2010: 182) assumed that the only intermediate input was seeds, taken as 8 per cent of gross output, so that agricultural net output value was 92 per cent of agricultural gross output value. Total population in 1763 was 30 million and agricultural population was 80 per cent of this, making 24 million. Agricultural net output per agricultural head was therefore Rs 12.3.

[2] Roy (2010: 185) considered three possible tax rates of 20, 10 and 8 per cent and showed that only the latter was consistent with the distribution of income between the state, the landlords and the peasants.

Turning to industry, average cloth consumption per head was 7 yards, which was multiplied by total population of 30 million to obtain cloth production for the home market of 210 million yards. With the addition of cloth exports of 30 million yards, this produced an industrial gross output volume of 240 million yards, and multiplying this by an average cloth price per yard of Rs 0.43 resulted in an industrial gross output value of Rs 103 milllion. With net output equal to 40 per cent of gross output, industrial net output was Rs 41 million.

Roy (2010: 182) calculated income for the economy as a whole by adding together net output in agriculture and textile manufacturing. This yields a total net income of Rs 335 million and total net income per head of Rs 11.2. Roy (2010: 187) went on to treat a peasant income of Rs 7 as providing nutritional adequacy, while still leaving a third of income to be spent on clothing and other necessities. If this is treated as the subsistence basket, it implies a welfare ratio of 1.6. Again assuming subsistence GDP is $400 in 1990 international prices, this in turn implies a GDP per head for Bengal of $640 in 1990 international prices. This is about 10 per cent above the Indian average GDP per capita in 1750 of $576 and places Bengal at a bit more than one-third of the British level in the mid-eighteenth century (Broadberry, Custodis and Gupta, 2015: 70).

6. REGIONAL VARIATION AND THE ASIAN LITTLE DIVERGENCE

More work is clearly needed on regional variation in India, particularly in light of the reversal of fortunes between northern and southern China with the use of high-yielding rice and the emergence of the Yangzi Delta as China’s leading region. A similar divide between dry farming of wheat in the north and paddy farming of rice in the south characterizes India, but this has not been highlighted in regional studies, perhaps reflecting low levels of irrigation in India compared with China. Nevertheless, the regional estimates of GDP per capita in India surveyed above suggest that the highest levels were to be found in Mysore in the south.

Following the approach of Broadberry, Guan and Li (2018), we construct a series for the GDP per capita leader of India by assuming that there was always one Indian region that was richer than the country as a whole by about the same amount as Mysore in 1800. This is shown in Figure 4, where we see that the Indian leader was at broadly the same level of GDP per capita as the Yangzi Delta in 1600. During the second half of the seventeenth century the Yangzi Delta increased its lead over the leading regions of both India and Japan, although this was largely a result of the Malthusian effects of a population decline in the Yangzi Delta during the Ming-Qing transition and did not herald a sustainable lead. Moving on to the eighteenth century, the Yangzi Delta began a steady decline at a faster rate than the decline in the Indian leader, so that by the mid-nineteenth century, there was again little difference between the leading regions of India and China. The most important developments during these two centuries occurred in Japan, where the leading region first caught up with and then overtook both Mysore and the Yangzi Delta. By the mid-nineteenth century the leading Japanese region had become the leading Asian region and Japan was poised to make the first Asian transition to modern economic growth.

7. CONCLUSIONS

This paper compares GDP per capita in the major Asian economies of China, India and Japan over the period 950-1870. The economic history literature has focused upon the Great Divergence of productivity and living standards during this period, noting the importance of regional variation within the Asian countries for the timing of the reversal of fortunes between the two continents. In this paper we consider the role of regional variation for the timing of the reversal of fortunes within Asia between Japan and the other two countries, known as the Asian

Little Divergence. Although some authors have noted the reversal of fortunes between China and Japan, here we also include India in the picture. We also take account of regional variation within the Asian economies, which has played such a crucial role in the timing of the Great Divergence. We show that regional variation also affects the timing of the Asian Little Divergence.

We begin by setting out the aggregate data for the national economies of China, India and Japan, taking no account of variations in the size of the three countries. This suggests that the Asian Little Divergence began in the eighteenth century when Japan overtook first India and then China. However, China and India both dwarfed Japan in terms of territory and population, while all three economies had significant regional variation in GDP per capita. These issues of regional variation and differences in size have played a crucial role in the timing of the Great Divergence because although average GDP per capita may be lower in a large country than in a small country, it is quite possible that within the large country there is a region of similar size to the small country which has a GDP per capita above that of the small country. Comparing the Yangzi Delta rather than China as a whole with the leading European economies shifts the timing of the Great Divergence from the fifteenth to the eighteenth century. Allowing for regional variation also significantly changes the dating of the Asian Little Divergence.

We first consider the role of regional variation within China, where the Yangzi Delta had a population around the same size as the whole of Japan. Since the Yangzi Delta was significantly richer than China as a whole, Japan did not succeed in overtaking the leading Chinese region until around the time of the Meiji restoration in 1868. Second, although Japan as a whole did not forge ahead of the Yangzi Delta until around 1868, the leading region of

Japan overtook the Yangzi Delta around 1800, nearly three-quarters of a century earlier. Although the leading Japanese region changed over time and was always a lot smaller than the Yangzi Delta, it played a key role as Japan became the first Asian economy to make the transition to modern economic growth. Adding India to the picture, although Japan had overtaken India as a whole by the early eighteenth century, the leading Japanese region did not forge ahead of Mysore until the early nineteenth century. However, since Mysore remained poorer than the Yangzi Delta throughout the period 1600-1870, developments in India had less significance for the timing of the Asian Little Divergence.

TABLE 1: GDP per head in Chinese regions, 1080-1850 ($1990)

	1080	1400	1580	1770	1850
NORTHWESTERN CHINA		543	508	368	422
Kaifeng Fu	1,930				
NORTHERN CHINA		419	463	473	353
Yangzi Delta	1,456	1,257	1,158	1,142	1,003
EAST CENTRAL CHINA		1,130	1,055	857	753
CENTRAL CHINA		808	792	787	646
SOUTHEASTERN CHINA		1,161	1,034	842	754
SOUTHWESTERN CHINA		685	690	791	694
OTHER TERRITORIES				552	765
CHINA	867	765	762	694	599

Source: Broadberry and Guan (2022).

TABLE 2: GDP per capita in Japanese regions ($1990)

Region	1600	1721	1804	1846	1874
East Tōhoku	-	706	1,074	1,183	1,025
West Tōhoku	-	856	953	1,043	1,093
East Kantō	-	499	700	734	718
West Kantō	-	593	866	992	1,163
Tōzan	-	610	670	723	845
Niigata/Hokuriku	-	712	691	780	959
Tōkai	-	675	754	781	863
Kinai	-	634	995	1,148	1,548
Around Kinai	-	645	833	925	1,170
Sanin	-	726	725	776	861
Sanyō	-	780	850	876	947
Shikoku	-	688	800	868	1,076
North Kyūshū	-	732	811	879	862
South Kyūshū	-	856	872	923	850
Japan total	667	675	828	903	1,011
Eastern Japan	-	626	847	932	989
Western Japan	-	704	819	889	1,022
Japan leader	-	856	1,074	1,183	1,548

Sources and methods: Derived from Takashima (2017) and Saito and Takashima (2016), following the method set out in Fukao, Bassino, Makino et al. (2015: Appendix 1).

TABLE 3: Occupational distribution of population and computation of aggregate welfare ratio for Mysore, 1800/01

	Population share	Ragi welfare ratio (Rg)	Weighted Rg
Small cultivators	0.09	2.9	0.26
Medium cultivators	0.17	7.68	1.31
Large cultivators	0.09	15	1.35
Agricultural labourers	0.01	0.815	0.01
Agricultural servants	0.14	0.93	0.13
Extractors of palm juice	0.14	5.63	0.79
Industrial proprietors, merchants	0.12	8.5	1.02
Industrial servants	0.005	1.635	0.01
Others	0.235	0	0.00
Whole economy	1.00		4.87

Source: Sivramkrishna (2009: 721).

TABLE 4: Adjusted aggregate welfare ratio for Mysore, 1800/01

	Population share	Ragi welfare ratio (Rg)	Weighted Rg
Small cultivators	0.04	2.9	0.12
Medium cultivators	0.08	7.68	0.61
Large cultivators	0.04	15	0.60
Daily wage agricultural labourers	0.00	0.82	0.00
Agricultural servants	0.33	0.93	0.31
Extractors of palm juice	0.14	1.73	0.24
Industrial proprietors, merchants	0.03	8.5	0.26
Industrial servants	0.10	1.64	0.16
Others	0.24	0	0.00
Whole economy	1.00		2.31

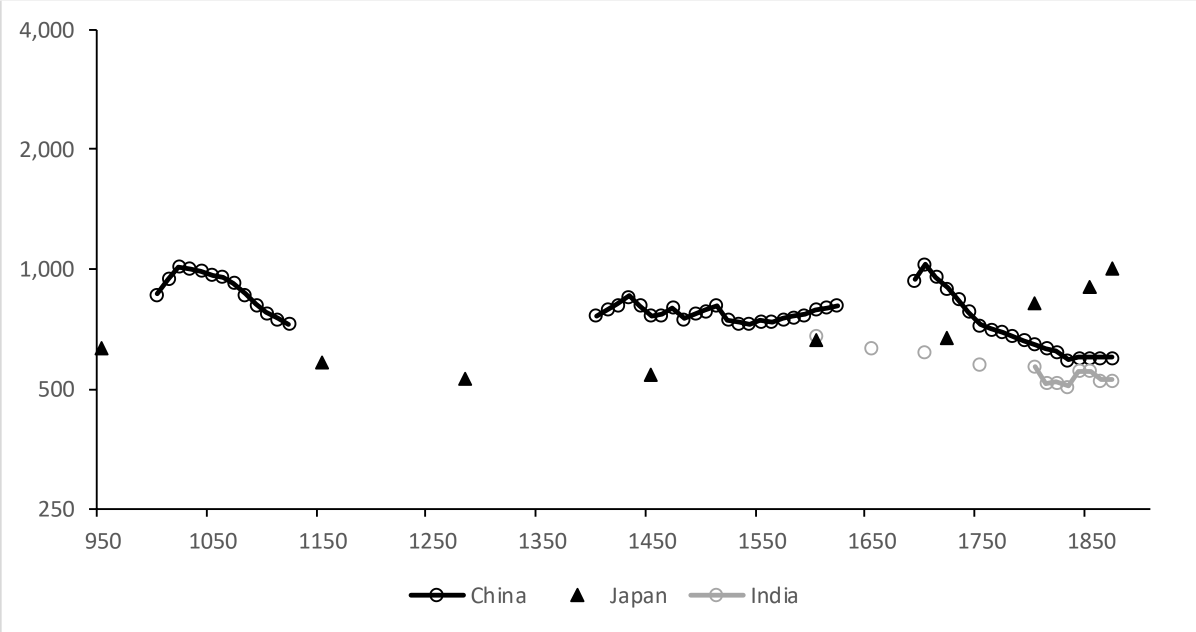
Source: Nagar (2022: 16)

TABLE 5: Income per capita in Bengal, 1763

	Share	Volume	Value
AGRICULTURE			
Tax revenue delivered to treasury			Rs 25.6 million
Tax share of agricultural gross output	0.08		
Agricultural gross output value			Rs 320 million
Seed share of gross output	0.08		
Agricultural net output value			Rs 294 million
Total population		30 million	
Agricultural population		24 million	
Agricultural net output per agricultural head			Rs 12.3
INDUSTRY			
Cloth consumption per head		7 yards	
Cloth production for home market		210 million yards	
Cloth exports		30 million yards	
Industrial gross output volume		240 million yards	
Cloth price per yard			Rs 0.43
Industrial gross output value			Rs 103 million
Industrial net output share	0.4		
Industrial net output value			Rs 41 million
TOTAL ECONOMY			
GDP value			Rs 335 million
GDP per head value			Rs 11.2

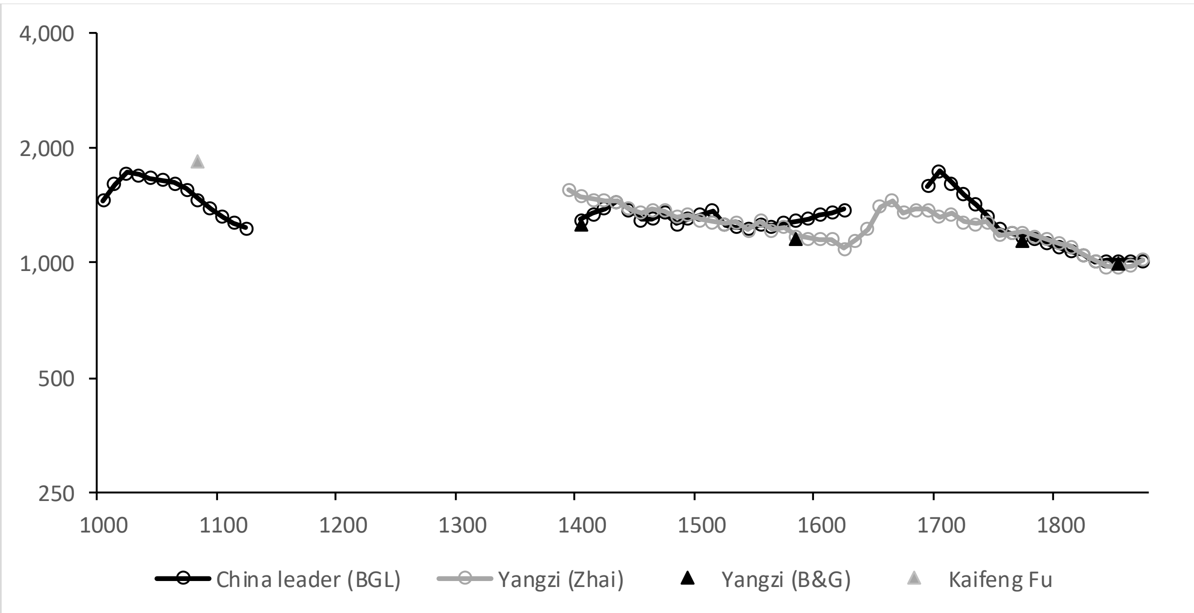
Sources and notes: Derived from Roy (2010: 182-187).
Agricultural gross output value = tax revenue delivered to treasury divided by tax share of agricultural gross output. Although overall land tax was 40 per cent of agricultural gross output, much of this was retained by the intermediaries, so that only 8 per cent was delivered to the treasury.
Agricultural net output value = agricultural gross output value multiplied by one minus the seed share of gross output.
Agricultural population = 80 per cent of total population.
Agricultural net output per agricultural head = agricultural net output divided by agricultural population.
Cloth production for home market = cloth consumption per head multiplied by total population.
Industrial gross output = cloth production for home market plus cloth exports.
Industrial gross output value = industrial gross output volume multiplied by cloth price per yard.
Industrial net output value = industrial gross output value multiplied by industrial net output share.
GDP value = agricultural net output value plus industrial net output value.
GDP per head value = GDP value divided by total population.

FIGURE 1: GDP per capita in Asian national economies, 950-1870 (1990 international dollars)



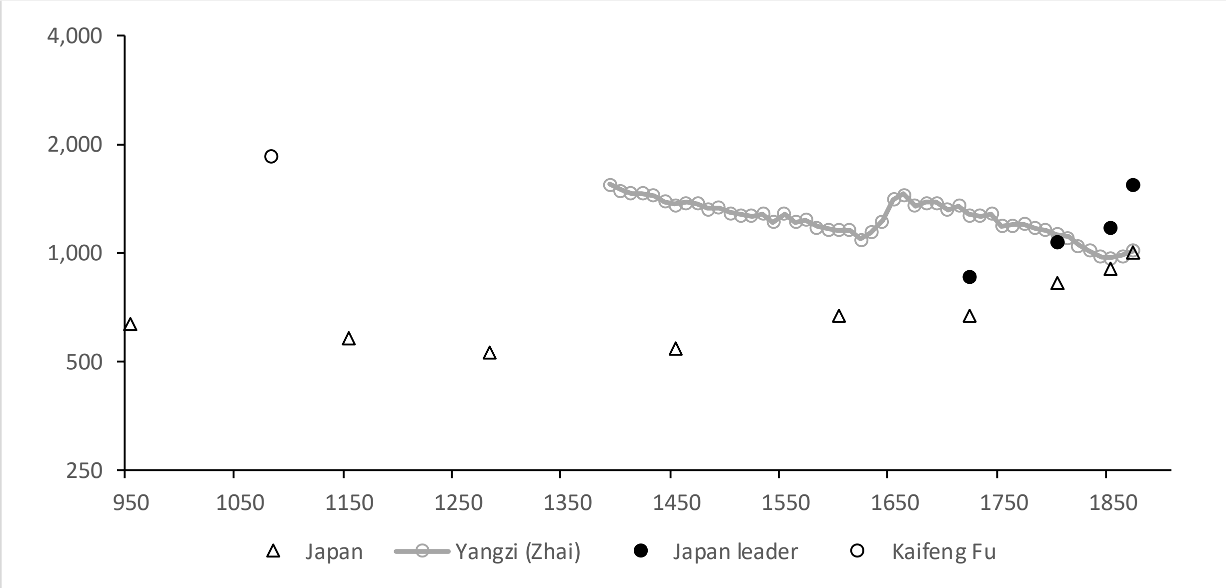
Sources: China: Broadberry, Guan and Li (2021). Japan: Bassino, Broadberry, Fukao et al. (2019). India: Broadberry, Custodis and Gupta (2015).

FIGURE 2: Regional variation of GDP per capita within China, 1000-1870 (1990 international dollars)



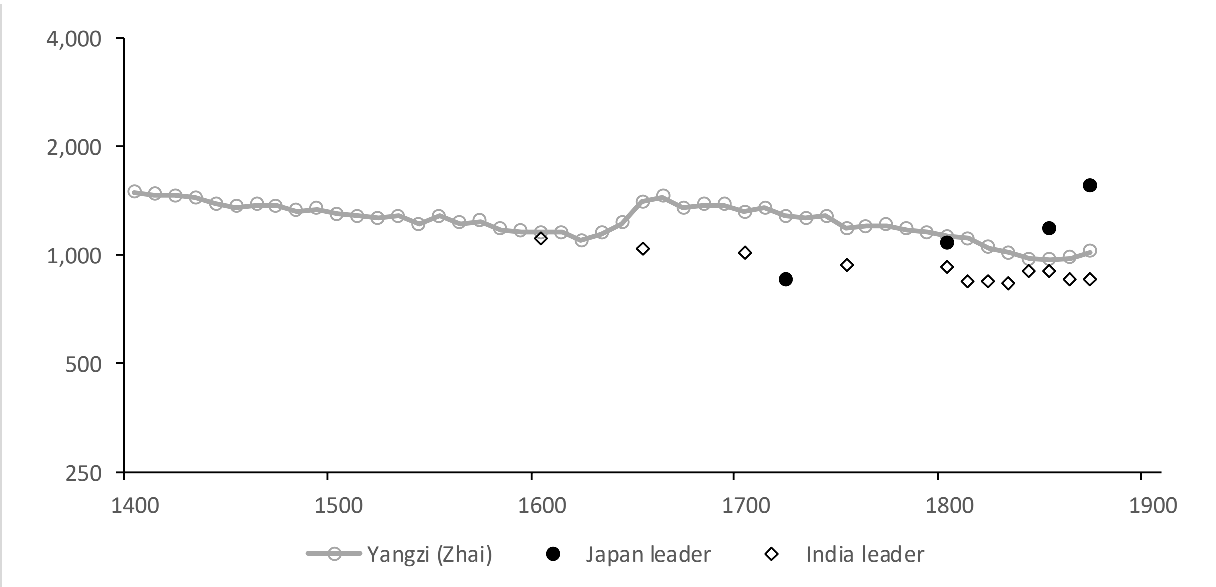
Sources: China leader (BGL): Broadberry, Guan and Li (2021). Yangzi (Zhai): Zhai (2023). Yangzi (B&G) and Kaifeng Fu: Broadberry and Guan (2022).

FIGURE 3: GDP per capita in the leading regions of China and Japan (1990 international dollars)



Sources: Japan: Bassino, Broadberry, Fukao et al. (2015). Yangzi (Zhai): Zhai (2023). Japan leader: Fukao (2024). Kaifeng Fu: Broadberry and Guan (2022).

FIGURE 4: GDP per capita in the leading regions of China, Japan and India (1990 international dollars)



Sources: Yangzi (Zhai): Zhai (2023). Japan leader: Fukao (2024). Kaifeng Fu: Broadberry and Guan (2022). India leader: Broadberry, Custodis and Gupta (2015), benchmarked on Nagar (2022) for Mysore.

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