

# *Poverty or prosperity in northern India? New evidence on real wages, 1590s–1870s<sup>†</sup>*

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This article introduces a new dataset on wages in northern India (from Gujarat in the west to Bengal in the east) from the 1590s to the 1870s. It follows Allen's subsistence basket methodology to compute internationally comparable real wages to shed light on developments in Indian living standards over time. It adjusts the comparative cost-of-living indices to take into account differences in climate and caloric intake due to variances in heights. The article also discusses the male/female wage gap in northern India. It demonstrates that the 'great divergence' started in the late seventeenth century, and widened further after the 1720s and especially after the 1800s. It was subsequently primarily England's spurt and India's stagnation in the first half of the nineteenth century that brought about most serious differences in the standard of living. If the British colonial state is to blame—as often suggested by the literature on India's persistent poverty—the fault lies in its failure to improve the situation after the British became near-undisputed masters of India in 1820.

At the end of the sixteenth century, the Indian subcontinent, largely unified under the Mughals, was one of the most developed parts of the global economy, with relatively high incomes and a thriving manufacturing sector. Over the centuries that followed, however, incomes declined and India de-industrialized. The precise timing and causes of the decline in Indian living standards in this period hold centre stage in the debate about the 'great divergence' between Europe and Asia. It is clear that before it is possible to start thinking about the causes of the decline, the timing needs to be established. In the most recent contribution to this discussion, Broadberry et al. have estimated GDP per capita for India between 1600 and 1871.<sup>1</sup> These estimates suggest that Indian per capita incomes steadily declined over the seventeenth and eighteenth centuries, and were about a third of those in England in the latter century. Both these GDP estimates and other contributions to the debate have to a large extent been based on wage evidence. Broadberry and Gupta, as well as Allen, have put forward data suggesting that

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<sup>1</sup> Broadberry, Custodis, and Gupta, 'India and the great divergence'; Broadberry and Gupta, 'Indian economic performance'.

Indian wage labourers were already relatively poor in the later seventeenth century,<sup>2</sup> while Parthasarathi and Sivramkrishna have produced wage evidence suggesting Indian standards of living were on a par with or even higher than in Europe even at the beginning of the nineteenth century.<sup>3</sup> Sivramkrishna's evidence concerns only southern India, while Parthasarathi's data and argument pertain to both southern India and Bengal (in the north-east). Our study develops new evidence for northern India only (including Bengal).

Consensus in the debate has been hindered by the general paucity of consistent quantitative evidence about wages and the labour market. Parthasarathi notes that the quantitative data are inconclusive, because 'wages found in primary sources are radically different from the scattered data in the secondary literature'.<sup>4</sup> Furthermore, he suggests that new primary evidence should be combined with information about the place of labourers in the larger political economy. Roy agrees that the wage evidence is 'hard to read unless we obtain more data on who were paying these wages and for what work'.<sup>5</sup>

In the period between the 1590s and the 1870s 'India did not exist as an integrated political, economic and environmental entity'.<sup>6</sup> As a consequence, living standards could differ significantly across different regions and aggregates for the entire subcontinent may provide us with little information. Within India, Bengal deserves particular attention if we are aiming to understand the timing of the great divergence, as it was highly commercialized and one of the wealthiest regions of India.<sup>7</sup> Furthermore, it was the first Indian region that was colonized after the English East India Company (EIC) took over *de facto* power from the Nawab after the Battle of Plassey in 1757 (although it took another 60 to 90 years for the north to be conquered entirely). Although significant amounts of new wage data are put forth for the regions of Gujarat, Agra, Awadh, and Delhi, most of the information presented in this article refers to north-eastern India: Bengal (as well as neighbouring Bihar and Orissa). The extent of colonial power changed over time and it is possible to distinguish between a pre-colonial (before 1757), early colonial (1757–1819), and mature colonial period (after 1819).<sup>8</sup> Given the importance many scholars have attributed to the role of colonialism in India's economic demise,<sup>9</sup> we need to study living standards over the entire period from the late sixteenth to the late nineteenth century.

A study of wages stretching from the late sixteenth to the nineteenth century may also add to the Indian historiography on the eighteenth century. In much of the traditional historiography, the eighteenth century has been regarded as 'an epoch of decay, chaos, greed and violence'.<sup>10</sup> Yet various studies that have

<sup>2</sup> Broadberry and Gupta, 'Early modern great divergence'; Allen, 'India in the great divergence'.

<sup>3</sup> Parthasarathi, 'Rethinking wages'; idem, *Why Europe grew rich*; Sivramkrishna, 'Ascertaining living standards'. Broadberry and Gupta, 'Early modern great divergence', noted the limited nature of Parthasarathi's evidence on southern India.

<sup>4</sup> Parthasarathi, *Why Europe grew rich*, p. 45.

<sup>5</sup> Roy, *Economic history*, p. 137.

<sup>6</sup> Ibid., p. 126.

<sup>7</sup> Roy, 'Economic conditions'.

<sup>8</sup> Only from 1819 onwards (but with the exception of the Sikh state in the Punjab) did the British prevail militarily (Cooper, *Anglo-Maratha campaigns*), which enabled them to interfere more actively with the economy at large and in particular with the labour market.

<sup>9</sup> For example, Bagchi, *Political economy*; Banerjee and Iyer, 'History'; Habib, 'Studying a colonial economy'.

<sup>10</sup> Washbrook, 'Eighteenth century issues', p. 372.

appeared since the 1980s paint a contrasting picture: one of economic growth, urbanization, and commercialization. Bayly paints a picture of dynamic north Indian regions in the eighteenth century, with various areas showing rising cultivation, commercialization, and relative prosperity despite political troubles.<sup>11</sup> Marshall notes the greater commercial integration of the larger Bengal region and the beneficial impact of the rise of the Calcutta market for the spread of new cultivation and the growth of employment opportunities in the eighteenth century,<sup>12</sup> a view that was recently confirmed and expanded on by Mukherjee and Datta.<sup>13</sup> Alam presents evidence of eighteenth-century rising trade and the growth of cities as a sign of increasing prosperity in the region of Awadh.<sup>14</sup> Similarly, a recent book by Yazdani observes Smithian economic growth and relatively high living standards in eighteenth-century Gujarat.<sup>15</sup> New wage data can shed more light on the issue of when precisely it was that the economy of northern India declined and how the rise of colonialism is related to these patterns.

In this article, we will introduce a new dataset on wages in India, collected from Dutch and British archival and secondary sources. This combined dataset contains an exceptional amount of detail (as compared with the few scattered wage observations that have been presented in the debate so far) about wages for a wide variety of occupations, for women and children, as well as for various towns across northern India from the late sixteenth to the late nineteenth centuries. Our data show that the great divergence between northern India and England started in the late seventeenth century. The eighteenth century was a period of decline in India as wage labourers saw their purchasing power diminish. During several periods in the eighteenth and nineteenth centuries the male wage was not sufficient to sustain a family above subsistence level, pointing to the importance of women's and children's contributions to household incomes.

## I

To what extent can the real wages of urban wage labourers be seen as representative of the standard of living of the vast majority of the population?<sup>16</sup> For India as a whole, it has been suggested that as a result of the high degree of monetization in towns (in which perhaps 10–15 per cent of the population lived):<sup>17</sup> 'money wages were universally in vogue for both skilled and unskilled labour'.<sup>18</sup> While some received payments in kind, Moosvi suggests that money wage payments were largely the rule in Indian towns in the seventeenth century.<sup>19</sup> Prakash adds that the Dutch East India Company (*Verenigde Oost-Indische Compagnie*; VOC) had no problem in finding sufficient labour at the prevailing market wage rates as the supply of labour was very flexible.<sup>20</sup> This is also in line with Nadri's finding that

<sup>11</sup> Bayly, *Rulers, townsmen and bazaars*.

<sup>12</sup> Marshall, *Bengal*, pp. 180–1.

<sup>13</sup> Mukherjee, 'Markets'; idem, *Political culture and economy*; Datta, *Society, economy and the market*.

<sup>14</sup> Alam, *Crisis of empire*, pp. 247–50.

<sup>15</sup> Yazdani, *India*, pp. 380, 553–6.

<sup>16</sup> See, for example, Booth, 'Measuring living standards'.

<sup>17</sup> Habib, 'Potentialities of capitalistic development', p. 201; Roy, *Economic history*, p. 108.

<sup>18</sup> Moosvi, 'World of labour', p. 246.

<sup>19</sup> Ibid.

<sup>20</sup> Prakash, *Dutch East India Company*, p. 238.

in Surat, 'beyond some conventional caste or ethnic influences or restrictions on mobility, the labour market was free and any employer could find workers if he wanted to'.<sup>21</sup> Generally high levels of monetization in early modern India, even comparable to Europe at times, have been noted in earlier research.<sup>22</sup>

For Bengal specifically there is elaborate evidence of the widespread existence of wage labour. The VOC silk reeling unit in Kasimbazar, established in the 1650s, perhaps employed as many as 4,000 workers in 1715.<sup>23</sup> In addition, a detailed sketch of labour at the Ichapur (near Calcutta) Gunpowder Factory shows that in the 1790s it could occupy as many as 2,000 to 2,500 unskilled and skilled labourers, which made it 'one of the world's largest factories'.<sup>24</sup> While no concrete numbers are given, the number of workers in the Mughal royal mints was probably also fairly large.<sup>25</sup> Next to these manufacturing centres, there were many wage labourers involved in the numerous building projects, constructing forts, other buildings, and ships (from which the wage data in this article were also taken).<sup>26</sup> Huge numbers of workers were engaged in the building of the new Fort William in Calcutta in the second half of the eighteenth century.<sup>27</sup> According to Marshall, 'no less than 30,000 coolies were said to be at work on the fort in 1761'.<sup>28</sup> While most of the construction workers employed were unskilled labourers, many skilled craftsmen such as masons, carpenters, and smiths were hired as well. These labourers were generally hired on a daily basis.

We collected wages mainly from three sources. For the period 1600–1800 wages were gathered from the VOC archives.<sup>29</sup> The Company's 'Proceedings of the Political Council' in Bengal, of which copies were sent to the Dutch Republic each year, also contained statements on the expenses incurred on the construction and repairs of different VOC buildings and ships. These documents state the costs of materials for the building project, as well as the various workers hired, and for how many days. As real wage studies on other areas, such as Europe, have often used the wages of building craftsmen and labourers, wages taken from these documents are comparable to those in other studies. Most of the wages listed in these documents were reported as daily rates.

The British data from 1775 to 1850 originate from the 25 volumes of proceedings of the Military Board of Ordnance (1775–85) and a selection of some 250 out of the in total 1,554 volumes of proceedings of its successor, the Military Board (1786–1858).<sup>30</sup> These two series (totalling an estimated one million written pages), available at the National Archives of India in New Delhi, provide an excellent source for virtually any research topic related to labour issues. Each week, the members of these boards discussed extensively the material needs of the army and the progress

<sup>21</sup> Nadri, *Eighteenth-century Gujarat*, p. 37.

<sup>22</sup> Lucassen, 'Labour and deep monetization'; idem, 'Deep monetization in Eurasia'.

<sup>23</sup> Prakash, *Dutch East India Company*, p. 117.

<sup>24</sup> Lucassen, 'Ichapur', p. 19.

<sup>25</sup> Prakash, *Dutch East India Company*, p. 117.

<sup>26</sup> Moreland, *India at the death of Akbar*, pp. 185–6.

<sup>27</sup> Sengupta, 'New Fort William', pp. 239–40.

<sup>28</sup> Marshall, 'Company and the coolie', p. 25.

<sup>29</sup> Dutch National Archives, The Hague (hereafter DNA), Archives of the Dutch East India Company (hereafter VOC) inv.no. 1.04.02, various volumes.

<sup>30</sup> National Archives of India, New Delhi (hereafter NAI), Board of Ordnance (hereafter BoO) and Military Board Proceedings (hereafter MBP).

reports of work being carried out. Each meeting was recorded in hundreds of pages of minutes, as all appendices were written out in full, certainly in the early decades. These discussions relate to building and repairing roads, canals, bridges, barracks, fortresses, hospitals, and bungalows, and the manufacture of arms, gun powder, uniforms, and so on. In order to determine the prices to be paid for labour, estimates were based on comparisons with previous works at the same spot or elsewhere, as well as with the 'nerrick' (local, frequently renewed tariffs).<sup>31</sup>

We conclude our series with hundreds of wage observations from William Wilson Hunter's 20-volume work, *A statistical account of Bengal* (1875–7), followed by a supplement on Assam (2 volumes, 1879) covering mainly the decades 1850–70, but also containing several earlier observations.<sup>32</sup> Commissioned by the colonial government whose headquarters were in Calcutta, Hunter collected his information through local correspondents. Their rich and detailed information was evaluated critically by Hunter himself, which makes his results at least as credible as similar information we have on other parts of the world, including Europe.

Our combined dataset is a significant leap forward in comparison to the limited amount of data that was available before, adding over 7,000 observations to the previously available few hundred. For our analyses, we also added material from previous studies to the database, bringing the number of observations to a grand total of 7,586.<sup>33</sup>

In terms of the temporal coverage of the new dataset, besides the observations from the well-known *Ain-i-Akbari*<sup>34</sup> from 1595, we added hundreds of VOC wage observations for the 1630s. Nonetheless, the data before 1680 are still scarce, which should be kept in mind when discussing the data for the earlier part of the period. Regionally our information pertains to many different places in the northern part of the Indian subcontinent, from Surat (Gujarat) in the west to Chittagong (Bengal) in the east. Figure 1 shows Mughal provinces or Indian states in the eighteenth century and all towns for which we have wage evidence in our database.<sup>35</sup>

Regional integration of labour markets is an important factor that influences wages, and bears on the representativeness of the wage levels presented here. The many navigable rivers that cross the part of the country under scrutiny from the west to the east create the geographical conditions for such integration. A detailed study of a gunpowder factory in late eighteenth-century Bengal has already suggested that the free labour market was relatively integrated as workers came to work seasonally at the factory from as far as Midnapore (150 kilometres to the west), the north of Orissa (some 250 kilometres to the south-west), and Chittagong (700 kilometres to the east by sea).<sup>36</sup> This seasonality is also an indication of the integration of industrial and agricultural labour markets in the Gangetic plains, as many Ichapur

<sup>31</sup> Statistical analysis in online app. S1 shows that those wages reported as nerrick and those paid out by the British were similar.

<sup>32</sup> In total these volumes contain more than 8,000 pages with detailed information.

<sup>33</sup> See online app. S1. Allen and Studer, 'Prices and wages'; Broadberry and Gupta, 'Early modern great divergence'; Haider, 'Structure and movement'; idem, 'South Asian economy'; Nadri, *Eighteenth-century Gujarat*; van Santen, *De Verenigde Oost-Indische Compagnie*.

<sup>34</sup> This was a detailed official account of the Mughal Empire, written by the court historian Abul Fazl.

<sup>35</sup> Borders are relatively fluid throughout this entire period, so this map should only be seen as indicative of regions.

<sup>36</sup> Lucassen, 'Ichapur', pp. 45–52.



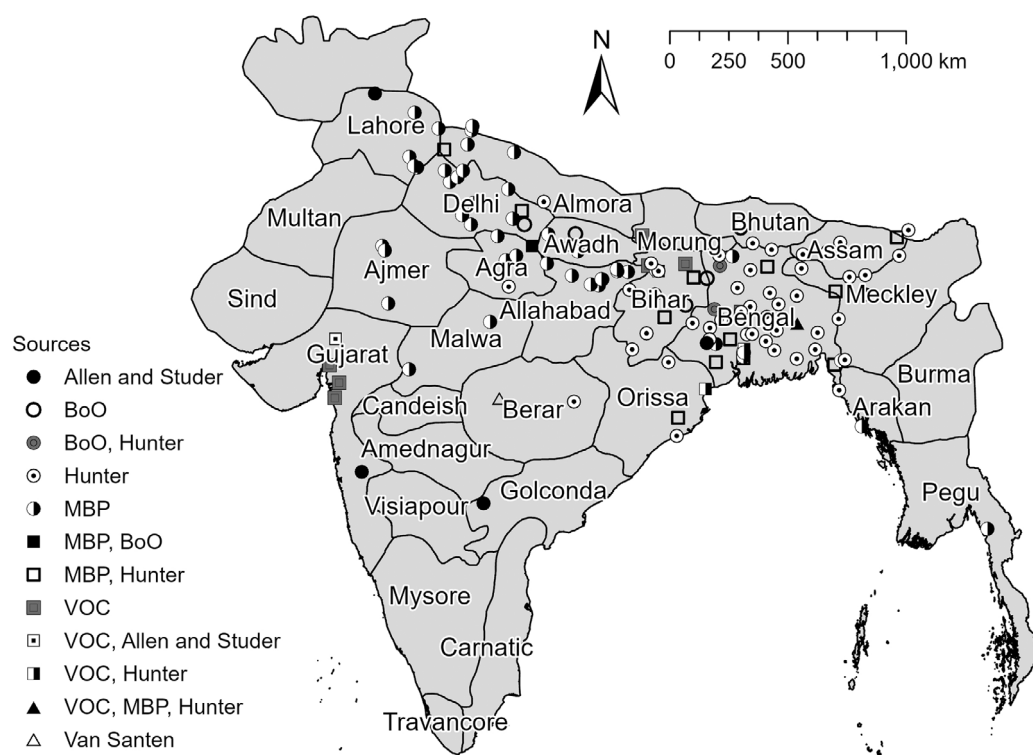


Figure 1. *Locations of wage data in various sources with eighteenth-century South Asian territories*

Sources: Allen and Studer, 'Prices and wages'; NAI, BoO; Hunter, *Statistical account of Bengal*; NAI, MBP; DNA, VOC; van Santen, *De Verenigde Oost-Indische Compagnie*; see also online app. S1. Created by the authors with ArcGIS.

factory workers were engaged in agriculture during the rainy season.<sup>37</sup> Another type of labour market integration existed between the plains and the mountains in the north. One of our sources suggests that when the cold weather approached, mountain dwellers descended to the neighbourhoods of Kashipur to fell timber, but returned home in April 'to avoid the sultry heats of the forest'.<sup>38</sup> Because our sources often report the dates to which the wages referred, we also analysed seasonality in the wage rates in the different areas, but could not discern a consistent pattern.<sup>39</sup> From a study on the construction of Fort William in the late eighteenth century, it seems that rather than paying higher wages, depending on season, it was simply the case that far fewer workers were attracted during harvest times.<sup>40</sup> Apart from seasonal labour migration, daily and weekly commuting was also common, according to our sources.<sup>41</sup>

<sup>37</sup> Among the many examples of this seasonal complementarity of agricultural and other work, see background information in NAI, MBP, 10 March 1812, pp. 5692–3; 22 June 1819, pp. 902–3; 11 Jan. 1820, p. 3885; 25 Jan. 1820, pp. 4111–12; 4 April 1820, pp. 5200–1; 12 Sept. 1820, pp. 2481–5.

<sup>38</sup> NAI, MBP, 29 May 1810, pp. 564–7.

<sup>39</sup> See online app. S1.

<sup>40</sup> Sengupta, 'New Fort William', p. 243.

<sup>41</sup> NAI, MBP, 19 March 1811, pp. 6073–4; 30 April 1811, p. 5588.

Since scholars have put forward wage evidence that supports different sides in the divergence debate, we must be wary about the extent to which the wages paid by these large European companies are representative of the general prevailing wage levels. A bias may present itself in two ways: first, there may be an upward bias as an additional premium may have been paid to ensure the efficiency and loyalty of the local workers; and second, the opposite may have been the case as the dominant position of the companies may have allowed them to squeeze these workers into accepting lower wages. A statistical analysis of the data suggests that on average the Dutch paid some 12 per cent lower unskilled urban wages in Bengal than the British, equal to the difference between 0.13 and 0.15 rupees per day in 1750, and 17 per cent lower skilled wages, equal to the difference between 0.21 and 0.17 rupees in 1750, suggesting that the British did not exploit their political position in the later eighteenth century to pay much lower rates than the Dutch. It may be a function of slightly higher wage levels in Calcutta—for which we have many British data—in comparison to wage levels in smaller Chinsurah, where the Dutch were more active. There is no significant difference in the payment of workers if all regions are considered.<sup>42</sup>

The dataset contains wages for a wide variety of occupations: in total some 290 different occupations of varying skills are reported on in the sources. The most frequently reported occupations are ‘coolies’ and other unskilled labourers (*bildars*,<sup>43</sup> *peons*,<sup>44</sup> and water carriers), carpenters, bricklayers, smiths, and caulkers, as well as soldiers and writers. In order to estimate wage trends for similar types of work, all occupations were coded following the HISCLASS scheme developed by van Leeuwen and Maas. On the basis of information on the level of skills and supervision involved and the rural or urban nature of the work, they defined 12 HISCLASS groups that range from 12 (unskilled farm workers) to 1 (higher managers).<sup>45</sup>

Our data and sources suggest that wages were most often paid on a daily basis and according to prevailing market rates. From the 1750s to 1770s, there is evidence that when the wages offered by the British in Calcutta were not high enough compared with private employers, this resulted in a shortage of workers.<sup>46</sup> Marshall noted regarding British employment of bricklayers that ‘it proved to be extremely difficult to prevent private employers luring these men away into their own service’.<sup>47</sup> Also for the early decades of the nineteenth century, we have found reports on the functioning of a highly competitive labour market, in particular in and around Calcutta. When the British had to set up a new gun carriage factory urgently in Cossipore, north of their capital, in 1804 they immediately needed 1600 artificers (who ‘could not be collected even in London on an emergency like the present in the short space of time we have done it, without other yards suffering a

<sup>42</sup> See online app. S1.

<sup>43</sup> A ‘*bildar*’ dug out foundations of buildings; see Marshall, ‘Company and the coolie’, p. 24.

<sup>44</sup> A ‘*peon*’ was an unskilled worker, originally a Portuguese term for a foot soldier, but later also used for a messenger, or ‘servant’; Yule and Burnell, *Hobson-Jobson*, pp. 696–7.

<sup>45</sup> van Leeuwen and Maas, *HISCLASS*. They code whether work was manual or non-manual, whether the skill level was high, medium, low or unskilled, and whether workers were supervising other workers or not and they use these codes to classify the occupations in 12 classes. See online app. S1 for detailed information about the procedures followed.

<sup>46</sup> Sengupta, ‘New Fort William’, pp. 239–42.

<sup>47</sup> Marshall, ‘Company and the coolie’, pp. 24–5.

decrease in their people') and therefore were 'fully aware that higher rates of wages and advances are the means that give us the preference we have had'.<sup>48</sup> The report also gives us an impression of the extension of the labour market by adding: 'If the other yards in town had adopted the system of always keeping every man in advance to them, we should have found a momentary difficulty, but only for a short time, as smiths and carpenters are coming in from Berhampore and the adjacent country on hearing of the opening of this yard'.<sup>49</sup> It should be noted that the distance from Berhampore to Cossipore is 550 kilometres.

As the British were gaining political power, discussions increasingly took place at the meetings of the Military Board about the nature of the labour market in Bengal and India at large. In the first decades of the nineteenth century the majority of its members still defended the principles of the free labour market. Member John Garstin on 19 February 1811 declared: 'The natives are not slaves and are at liberty to serve those who give the highest wages and best usage. If they enter into agreements the Law will compel their fulfilment. Otherwise there is no remedy'. One week later he added: 'To fancy, however fair the promise may be, that men will work for the pleasure of serving a European, is only to deceive ourselves'.<sup>50</sup> His colleague John Horsford declared: 'Extra work must have extra pay. It is the custom of all nations and founded in justice'.<sup>51</sup>

After the demise of Napoleon in 1815 and in particular of the Mahrattas in 1819, the Military Board changed its mind and was more supportive of interfering in the labour market by different means, for example, by employing convict or *corvée* labour, by lowering pay rates in barrack towns, or by declaring the priority of government over private English employers, and the latter over their Indian colleagues.<sup>52</sup> There are extensive discussions about the labour market in Delhi in the years 1819–20 in which several opinions among the British military clash. One complains that after the British takeover of power 'a spirit of independence' has invaded the workers,<sup>53</sup> who no longer are prepared to perform *corvée* work for which they received a daily allowance as usual under the Mughals. Another flatly denies this and states it is possible simply to call upon the heads of certain castes to obtain workers. A third view balances different forms of work incentives: 'I am unable to say perhaps the prospect of certain hire for a great length of time may induce the people willingly to give their services or that if compulsion is used in obtaining them it is only that kind of compulsion that the people do not object to because it is the custom of the country'.<sup>54</sup>

On the basis of our sources, as well as the literature on labour in India in this period, it can be concluded that our wages provide information about the incomes of an important body of workers in northern India: wage labourers of

<sup>48</sup> NAI, MBP 28 Sept. 1804, p. 1775.

<sup>49</sup> NAI, MBP 28–09–1804, pp. 1775–6.

<sup>50</sup> NAI, MBP, 19 Feb. 1811, p. 5564; 26 Feb. 1811, p. 5627.

<sup>51</sup> NAI, MBP, 14 May 1811, p. 253.

<sup>52</sup> Attempts to reduce wages, for example, NAI, MBP, 11 Dec. 1810, pp. 4266–7; 18 Dec. 1812, p. 5360; 8 Feb. 1820, pp. 4399–401; attempts to employ convicts, for example, NAI, MBP, 5 Dec. 1800, pp. 3706–10; 28 Sept. 1804, pp. 1760–7; 28 Jan. 1812, pp. 5023–35; 24 Oct. 1820, pp. 3049–50; 24 Oct. 1820, p. 3049; 13 Jan. 1835, pp. 7207–16; attempts at introducing *corvée*, for example, NAI, MBP, 10 Aug. 1819, pp. 1559–63.

<sup>53</sup> NAI, MBP, 22 June 1819, pp. 812–16.

<sup>54</sup> NAI, MBP, 14 March 1820, pp. 5020–39.



varying skill levels. There was little slavery and serfdom in India,<sup>55</sup> and wage labour was relatively widespread. There was a functioning free labour market in which the Companies enjoyed no clearly privileged position. The data obtained for India can therefore be seen as comparable to those gathered for many European cities, as these are also very often wages of construction workers paid for by large institutions.<sup>56</sup>

As colonial and pre-colonial India was mainly an agricultural economy, with over 70 per cent of the labour force employed in agriculture in 1870,<sup>57</sup> more research needs to be carried out on the earnings of peasant families in order to see how these compare with those of wage labourers, to get a better picture of general Indian living standards. Over the long run, it is hard to imagine a large and consistently diverging difference in the living standards of these groups, as we know that peasants also engaged in wage labour occasionally.<sup>58</sup>

## II

Following the methodology of computing internationally comparable 'subsistence ratios', pioneered by Allen, these wages can be converted into real wages.<sup>59</sup> Allen recently argued that an average male adult needs 2,100 kcal per day in order to provide enough nutrients to survive and for workers to be able to provide for the income necessary to buy these calories.<sup>60</sup> These 2,100 kcal are consistent with the current-day World Bank poverty line of \$1.25. As a result of this methodology, the focus here is on the consumption of necessities. From earlier studies, it is clear that a variety of luxuries were available in Indian markets in this period,<sup>61</sup> yet luxury consumption remained largely an elite phenomenon and no 'consumer' revolution took place in India in this period.<sup>62</sup>

In this article, we make further adjustments to the methodology, as caloric needs are dependent on height and weight. Since nineteenth-century Indians were smaller than Britons, they required fewer calories for performing the same amount of work. In the 1840s, the earliest decade for which Indian height data are available, Indians were on average 160.3 cm tall, while the average Briton was 166.5 cm.<sup>63</sup> Assuming a similar body mass index of 22.5 kg/m<sup>2</sup>, this implies an average weight for an Indian of 57.8 kg and 63.4 kg for the Englishman. An average weight difference of 5.6 kg translates into a difference in caloric need of between 65 and 140 kcal per day, depending on the level of physical activity. Therefore it seems reasonable to deduct 100 kcal from the Indian baskets, which is thus computed to contain 2,000 kcal. It is possible that the differences in body weight, and consequently of caloric intake, between the average inhabitant of India and the average Briton in the nineteenth century have been even more substantial. In 1849, two engineers who

<sup>55</sup> Roy, *British rule*, p. 90.

<sup>56</sup> Allen, 'Great divergence in European wages'.

<sup>57</sup> Broadberry and Gupta, 'Indian economic performance'.

<sup>58</sup> Roy, *Rethinking economic change*, p. 44.

<sup>59</sup> Allen, 'India in the great divergence'; Allen and Studer, 'Prices and wages'.

<sup>60</sup> Allen, 'Poverty lines'.

<sup>61</sup> Nadri, *Eighteenth-century Gujarat*; for Bengal, see Mukherjee, *Political culture and economy*.

<sup>62</sup> Gommans, 'For the home'; Yazdani, *India*, p. 553; Mukherjee, *Political culture and economy*.

<sup>63</sup> Baten and Blum, 'Human height since 1820'.

were commissioned to investigate the differences in performance of prisoners in the Calcutta and London jail, working identical treadmills, blamed it precisely on these differences in average body weight. According to them the weight of an average adult male Briton at the time was between 140 and 150 pounds (*c.* 66 kg) compared to 110–112 pounds (*c.* 50 kg) for an inhabitant of Bengal.<sup>64</sup> It is obvious that such a substantial difference for male prisoners, if corroborated by other evidence, has consequences for the comparison of real wages and living standards in general between Europe and India.

Further influences on the cost of living may depend on climate/temperature. Yet no consensus on this has been reached and the Food and Agriculture Organization/World Health Organization committee noted in 1985: 'in view of the scanty and conflicting information, the 1971 Committee did not recommend any adjustments to the energy requirement for differences in environmental temperature. The present Consultation accepts that view, although the subject is one that requires further study'.<sup>65</sup> Therefore we have not made further adjustments in terms of caloric intake. We did, however, reduce the amount of clothing in the Indian basket, considering the generally warmer temperatures. Furthermore, Indians generally walked barefoot, whereas Europeans typically sported boots. Indian convicts, for example, received annually only one new piece of unbleached cotton loincloth, and one new turban.<sup>66</sup> For similar climate-related reasons, the amount of fuel has been limited for India (1 MBTU vs. 3 MBTU for Britain).<sup>67</sup>

Because of data constraints, we are unable to compute price series for each of the separate territories shown in figure 1. Instead we create baskets and price series for macro regions that had more or less similar agricultural conditions and diets: north-western India (including Gujarat and Ajmer), northern India (Agra, Allahabad, Awadh, and Delhi), and north-eastern India (Assam, Bengal, Bihar, and Orissa). Southern India is not included in our real wage computations.

In earlier work, Allen created a basket for India containing 1,940 kcal per day mainly from some rice or millet, some beans, as well as small quantities of meat, ghee, sugar, and cotton.<sup>68</sup> We suggest that this very basic basket may even have been too luxurious for the very poor, whose food is described as 'boiled rice, nichany, millet and grass roots'.<sup>69</sup> Research on agricultural production in the first half of the nineteenth century suggests the importance of relatively cheap carbohydrates such as *jowar* (sorghum) and *bajra* (millet) in northern and north-western India. Cropping patterns suggest that in the Agra area sorghum and millet

<sup>64</sup> NAI, MBP, 1 Feb. 1850, p. 14739 (report by W. N. Forbes & H. Fraser, 24 Oct. 1849). Around 1880 Dacca inmates (50 Muslims and 50 Hindus) showed an even lower BMI as on average they were 33 years of age, measured 1.62 metres, and weighed 49 kg or 108 pounds; Wise, *Notes on the races*, p. 12.

<sup>65</sup> WHO, 'Energy and protein requirements', p. 128.

<sup>66</sup> For clothing: NAI, MBP, 25 Feb. 1803, p. 3556; 7 June 1805, p. 432. According to Shakespear et al., *Report of the India*, app. 14, pp. 2–5, 13–14, the expenses of clothing and blankets for all prisoners in Bengal and Uttar Pradesh amounted to 14% of the cost of their food, which translates into roughly 10% of their total expenses. This is twice as much as we have currently estimated for their expenses on clothing (about 5%), which we suppose is a result of the inclusion of blankets in the calculation for the prisoners. Since the method does not include blankets for Europe and China either, we have kept the amount of cotton at 1.5 metres.

<sup>67</sup> Our sources suggest that workers may have spent 5% of their budget on fuel and heating; NAI, MBP, 15 Aug. 1815, pp. 1584–6. In our baskets, even the reduced amounts of MBTU still account for some 10% of the total expenses. Thus, if anything, we are still overestimating the costs of fuel and heating in India.

<sup>68</sup> Allen, 'India in the great divergence'.

<sup>69</sup> Chandra, 'Standard of living', p. 462.

Table 1. 'Barebones' consumption baskets in northern India and England

|                              | Unit           | Quantity per person per year |                |                     |         |
|------------------------------|----------------|------------------------------|----------------|---------------------|---------|
|                              |                | North-western India          | Northern India | North-eastern India | England |
| Wheat/rice <sup>a</sup>      | kg             | 57                           | 57             | 162                 | 196     |
| Millet                       | kg             | 60                           | 60             |                     |         |
| Sorghum                      | kg             | 60                           | 60             |                     |         |
| Chickpeas                    | kg             | 20                           | 10             | 30                  |         |
| Moth beans                   | kg             |                              | 10             |                     | 20      |
| Meat                         | kg             |                              |                |                     | 5       |
| Butter/ghee                  | kg             | 3                            | 3              | 3                   | 3       |
| Sugar                        | kg             | 2                            | 2              | 2                   |         |
| Soap                         | kg             |                              |                |                     | 1.3     |
| Cotton                       | m <sup>2</sup> | 1.5                          | 1.5            | 1.5                 | 3       |
| Candles                      | kg             |                              |                |                     | 1.3     |
| Lamp oil                     | litre          | 2.6                          | 2.6            | 2.6                 | 1.3     |
| Fuel                         | MBTU           | 1                            | 1              | 1                   | 3       |
| Nutrients per person per day |                |                              |                |                     |         |
| Calories                     | kcal           | 2,007                        | 2,000          | 2,001               | 2,101   |
| Protein                      | g              | 65                           | 66             | 50                  | 91      |

Note: a North-eastern India: rice; England and northern and north-western India: wheat.

Sources: See section II and Allen, 'Great divergence in European prices'; idem, 'India in the great divergence'; idem, 'High wage economy'.

were more important than wheat as a staple. In Farukhabad (Delhi region) the relative importance of these three crops is more balanced.<sup>70</sup> Divekar notes that in Surat 'rice was as important as jowar'.<sup>71</sup> The Bengali diet was highly dependent on rice; Datta quotes a budget for a common artisan in Rangpur (Bengal) c. 1807, over 80 per cent of which is made up of rice.<sup>72</sup> Table 1 shows the baskets created by us for different parts of India, containing almost equal amounts of wheat, millet, and sorghum, as well as some chickpeas (*gram*) and beans (*moth*) in northern and north-western India. For north-eastern India, the basket is dominated by rice. The 162 kg of rice for one person per year also fits with the observation from the archival records suggesting that the daily allowance of one pound of rice was sufficient for a healthy man.<sup>73</sup> In addition, some ghee and sugar were included in the Indian baskets, but no meat, in the light of the evidence cited above, as well as the lack of any price evidence. A comparison of different diets for convicts shows that they all received dal (lentils), salt, turmeric, chillies, and tobacco. Prisoners from Agra and Allahabad ate flour and ghee, while those from Bengal and Bihar consumed rice, oil, tamarind, and onions.<sup>74</sup> The British basket was slightly more luxurious, as it also contains some meat. As a result, the English diet not only contains more kcal (2,100 vs. 2,000), it is also relatively rich in protein: 91 grams per person per day. The northern and north-western Indian baskets contain some 65 grams of protein, while that of north-eastern India contains only 49 grams of protein (as rice

<sup>70</sup> Kessinger, 'North India', p. 260.

<sup>71</sup> Divekar, 'Western India', p. 336.

<sup>72</sup> Datta, *Society, economy and the market*, p. 193.

<sup>73</sup> NAI, MBP, 10 Sept. 1802, pp. 1875–7. One pound (0.45 kg) per day equals 165 kg per year. As Allen does not include salt in his baskets for Europe and China, we too have omitted this essential item from our comparative calculations.

<sup>74</sup> NAI, MBP, 10 March 1812, pp. 1584–6.

is relatively poor in protein content, compared with wheat, millet, and sorghum) (see table 1).<sup>75</sup> Nonetheless, even this limited amount of protein is sufficient as a person requires 0.8 grams of protein per kg of body weight,<sup>76</sup> which means that the average Indian needed 46 grams per day.

We use the price series as constructed by Allen and Studer to compute the costs of this basket over time, with some alterations.<sup>77</sup> For example, as they had limited evidence on textile prices, we added information on prices paid for textiles in Bombay and Calcutta by the English East India Company.<sup>78</sup> Furthermore, while we linearly interpolated the price series in the case of gaps of less than 10 years, larger price gaps were imputed by calculating the relative weights of the various goods in the basket and adding those weights to the basket in case of missing data (hereby following the procedure as shown by Arroyo Abad et al.).<sup>79</sup>

One issue with these price series is that they are often based on data for a particular town; for example, Surat, Pune, and Mumbai in the case of West India. For Bengal, these prices may refer to Calcutta or Chinsurah, or represent some sort of regional average. Differences in prices within these macro-regions may, of course, have influenced the regional development of living standards. Studer has shown that regional grain markets were integrated across distances of some 35 kilometres in the late eighteenth century. There were also some markets connected within the 70-kilometre radius, but beyond that the connection of markets was weak. Correlations could also occur at larger distances in some cases—probably as a result of connections via navigable rivers.<sup>80</sup> The extent of market integration probably improved towards the end of the nineteenth century. Clearly, more research into local Indian prices in the early modern period could be done in the future. For now, we would argue that using these prices will suffice for outlining the long-term general trends. From figure 2a it becomes clear that despite some differences in the short-run fluctuations, the prices show more or less similar long-run trends across these three macro-regions of India. Prices were relatively high everywhere in the first half of the seventeenth century, and then reached their lowest levels in the second half of that century. Prices increased steadily over the eighteenth century and then declined somewhat, or stabilized, in the first half of the nineteenth, before rising again in the second half of that century.<sup>81</sup> In order to get a rough understanding of living costs in India from a comparative perspective, these prices are converted from rupees into silver values (11.54 grams),<sup>82</sup> and placed next to the cost of a similar basket in different parts of Europe and China in figure 2b. For almost the entire period, the price of basic consumables was substantially lower in silver values than in other parts of Europe.

<sup>75</sup> Protein content of main crops: wheat (*Triticum aestivum* L.), 113g; rice, 75g; sorghum (*Sorghum bicolor*) 113g; chickpea/gram (*Cicer arietinum*), 205g; moth beans (*Vigna aconitifolia*), 229g; millet (*Panicum miliaceum*), 110g; US Department of Agriculture, *FoodData Central*, (<https://fdc.nal.usda.gov> (accessed on 29 Oct. 2019)).

<sup>76</sup> Allen, 'India in the great divergence', pp. 23–4.

<sup>77</sup> Allen and Studer, 'Prices and wages'.

<sup>78</sup> Evidence from Chaudhuri, *Trading world*, and Bowen, *Business of empire*. It was estimated that one piece of textile was about 2.6 m<sup>2</sup> of cotton.

<sup>79</sup> Arroyo Abad, van Zanden, and Davies, 'Conquest'.

<sup>80</sup> Studer, 'India and the great divergence'.

<sup>81</sup> The same rise in prices was also observed for Rajasthan; Mathur, 'Change and continuity'.

<sup>82</sup> While Allen and Studer in their database assume 10.78 grams of silver per rupee, we follow Haider ('Structure and movement', p. 293) the foremost expert on Indian monetary history, in computing silver values using a rupee of 11.54 grams of silver. It has no effect on the overall results.

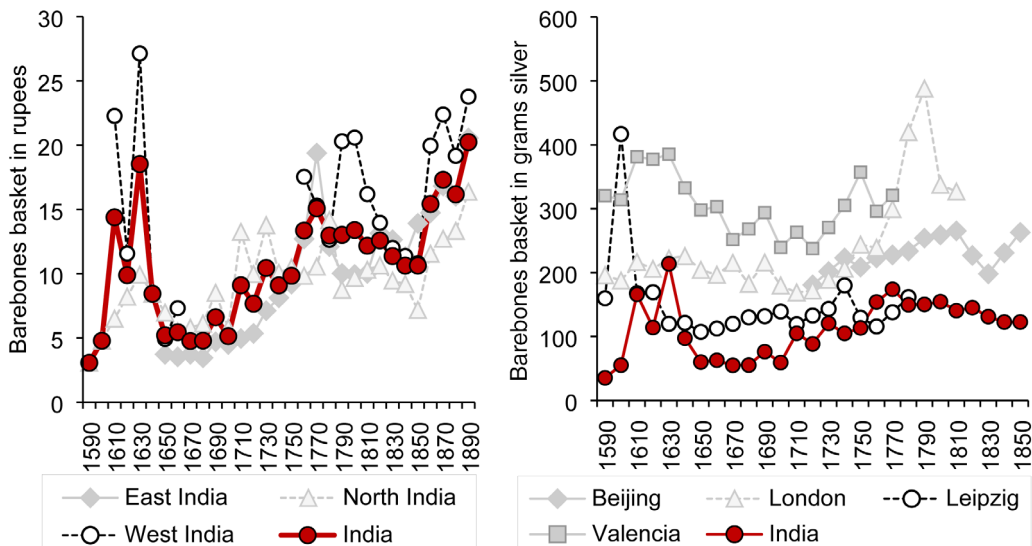


Figure 2. Consumer prices (a) in India and (b) in comparison with Europe and China [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Sources: India: Allen and Studer, 'Prices and wages', Chaudhuri, *Trading world*, pp. 506–48; Bowen, *Business of empire*, pp. xii, 233–5; idem, 'East India Company'; Europe and China: Allen, 'Great divergence in European wages'. For further details, see section II.

Following Allen, the cost of the basket was multiplied by 4 in order to account for the needs of other family members. Allen's total of 20 per cent of household expenses for housing seems too high for India, however. Our sources suggest a labourer's family spent around one rupee per year on housing in Purneah *c.* 1820, which reflects 10 per cent of their total budget. Similarly, our sources suggest that housing for labourers' families in Dinapore *c.* 1800 was very basic, and about the huts of Dacca workmen in 1820 it is said:

The thatched houses being of very combustible materials are generally burned down once, if not twice, per annum, and are viewed while burning by their owners with an apathy truly Asiatic. Into large earthen pots, sunk in the ground, they throw the few valuables they possess, and mats, thatch and bamboos being plenty the expenditure of a few rupees restores their edifice to all its original splendour.<sup>83</sup>

Therefore, we have multiplied the budgets by 4.1 instead of the 4.2 used for Europe.<sup>84</sup>

Obviously, this procedure is based on further assumptions regarding family size and the caloric needs of women and children, which are necessary to make international comparisons. These assumptions will be discussed in more detail later. Using data from Allen and Studer and the wages from the sources discussed in the previous section, a series of comparative real wages, represented by way of 'subsistence ratios', can be computed for different areas in India (figure 3),

<sup>83</sup> Wise, *Notes on the races*, p. 61.

<sup>84</sup> Following the latest adjustments to the methodology; Allen, 'High wage economy'. NAI, MBP, 27 June 1820, pp. 1064–9; 28 Jan. 1803, pp. 2378–9, 3279–84).



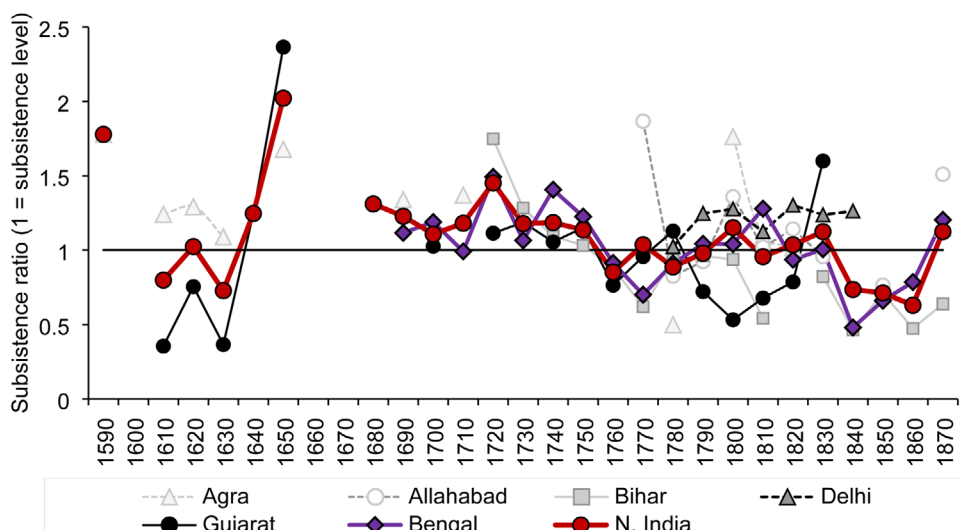


Figure 3. *Unskilled worker subsistence ratios in northern India, 1590–1870*  
[Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Sources: See sections I and II and fig. 2.

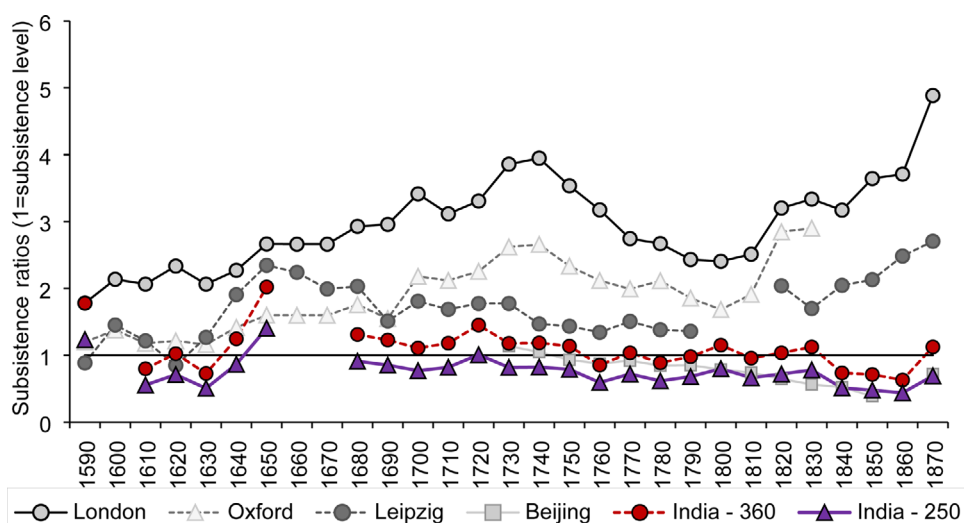


Figure 4. *Subsistence ratios, unskilled workers in Europe, China, and India, 1590–1870*  
[Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Sources: Europe and China: Allen et al., 'Wages'. India: see sections I and II and fig. 2.

and compared with Europe (figure 4) from the late sixteenth to the nineteenth centuries. In order to make sure we are comparing wages for similar types of work, we only include the wages of workers in HISCLASS 11—unskilled workers with up to 30 days of training and no supervision—in the analysis, basically unskilled workers, soldiers, sailors, watermen, and *bildars*. Women and children,

as well as Europeans, were also excluded from this analysis (for women and children's wages, see the next section). Furthermore, for figure 3 we assumed that Indians worked 360 days per year, as from our sources—both the Dutch and British—it became clear that monthly pay equalled 30 days of work.<sup>85</sup> However, because it is unclear whether Indians would also actually work so many days throughout the entire year, and to make a fair comparison with the European real wages in figure 4, we also provide the calculations for working years of 250 days.<sup>86</sup>

Figure 3 shows male wages relative to the cost of living for a household in different parts of northern India. It is important to keep in mind that the data on which these computations were based were most abundant for Bengal. Some general trends can be observed, and they are best captured by the north Indian average shown in the figure. The trends for the early seventeenth century are based on very limited data and should therefore be treated with caution.<sup>87</sup> From the late seventeenth century on, the evidence becomes more abundant and the general patterns more reliable. There was a decline from subsistence ratios around the 1.5 level from the late seventeenth century to levels below subsistence in the middle of the eighteenth century. A low point can be observed for regions such as Bengal and Bihar in the 1760s and 1770s. This was when the great Bengal famine took place.<sup>88</sup> Subsistence ratios fluctuated around subsistence level in most regions around the turn of the nineteenth century. Gujarati real wages diverged from this trend, reaching their lowest point around 1800. Between the 1830s and 1860s real wages were again below subsistence level in most regions. The low living standards in the early and mid-nineteenth century may perhaps be attributed to deliberate attempts by the British Military Board to push down wages from the 1810s, as discussed in section I. While these measures may not always have been successful, the sources make it clear that the British were certainly not interested in raising the wages from their abominably low levels.

The fact that during certain decades over this entire period, wages plummeted below subsistence level in different parts of India meant that women and/or children also had to contribute to household income in order for these families to survive, as we will discuss later. Furthermore, this also meant that during some years of excessive hikes in basic food prices, income was insufficient to provide enough food, causing occasional famines, such as the Bengal famine of 1769/70 which caused a tremendous loss of life.<sup>89</sup>

Taking a look at the comparison of subsistence ratios between Europe, China, and India in figure 4, it can be seen that the newly unearthed Indian wage data

<sup>85</sup> DNA, VOC, 8791, pp. 343, 347–8; 8793, pp. 274–6; 8800, p. 141; 8802, p. 71; 8805, p. 66; NAI, MBP, 25 April 1820.

<sup>86</sup> We do not currently correct for the fact that in Europe different wages were paid in summer than in winter, as a result of the longer summer days. Besides, historical wage series for Europe are always based on the (higher than average) summer wages. This difference could be substantial: in the Netherlands winter wages could be about 20% lower than summer wages; van Zanden, *Arbeid*, pp. 136–7. For England, however, the difference seems to have been smaller; Clark, 'Long march', p. 130, found that summer wages were on average only 4% higher than those paid in the other seasons, and Stephenson, '“Real” wages?', p. 120, found no difference.

<sup>87</sup> See online app. S1 for the error margins of the separate series.

<sup>88</sup> See also de Zwart, *Globalization*, p. 159, who dates the absolute low point of real wages in 1769.

<sup>89</sup> Datta, *Society, economy and the market*. As we computed 10-year averages, this reduces some of the variation that could have been observed in the annual series. It is clear from the data that real wages reached an absolute low point in Bengal in 1769.

confirm the more pessimistic views of Indian early modern living standards (as put forth by Allen, and Broadberry and Gupta) rather than the more optimistic views (such as those of Parthasarathi and Sivramkrishna).<sup>90</sup> By the early eighteenth century, a clear gap in real wages had emerged between England and India. If we ignore the high wages of London, which may not be representative of the prevailing wage levels in the British Isles,<sup>91</sup> a gap seems to emerge between the wages in Oxford and those in India (and Leipzig and Beijing, for that matter) from the late seventeenth century onwards. This gap widens after the 1720s and especially after the 1800s. Evidence from earlier research suggests the divergence continued until at least 1913, as Indian real incomes stabilized or even declined after the 1870s, while European real wages continued to increase.<sup>92</sup>

To what extent do these wages for unskilled workers reflect wider trends that are also captured by other workers? Parthasarathi's claims of relatively high Indian wages in southern India and Bengal by the mid-eighteenth century refer to the earnings of skilled weavers. Apart from the incomes of weavers, hardly any information on the wages of skilled craftsmen has been available hitherto.<sup>93</sup> Our dataset also allows us to include skilled real wages in the comparison. For Agra, Bengal, Bihar, Delhi, and Gujarat we have observations that allow us to sketch long-run wage levels for skilled workers.<sup>94</sup> Figure 5 shows the average subsistence ratio of skilled craftsmen (HISCLASS 7 in the dataset) for all these regions combined, compared with those of similar workers in Europe. This comparison leads to the same results as the figures for unskilled wages. Skilled real wages were relatively high at the end of the sixteenth century. High levels are also observed for 1680, but this is based on only limited amounts of data for Gujarat and should therefore be treated with caution.<sup>95</sup> For the eighteenth and nineteenth centuries we are more certain about the real wage levels. Throughout those centuries, skilled workers in northern India generally had to work over 250 days per year to raise living standards above subsistence level.

While a lengthy discussion of the differentials between Indian skilled and unskilled wages (or 'skill premium') is outside the scope of this article, our data imply a perhaps surprisingly low skill premium in eighteenth-century India, as real wages of skilled workers were only between 50 and 100 per cent higher than unskilled wages for many decades. Such skill premiums are comparable to European levels.<sup>96</sup> In the late sixteenth and seventeenth centuries, the skill premium was probably relatively high, as earlier studies have also observed.<sup>97</sup> More research

<sup>90</sup> Parthasarathi, 'Rethinking wages'; idem, *Why Europe grew rich*; Sivramkrishna, 'Ascertaining living standards'. It should be noted, however, that most of the evidence presented by Parthasarathi and Sivramkrishna refers to a very limited amount of observations for southern India, about which we have no data.

<sup>91</sup> For the representativeness of the London wage series, see the recent debate between Allen and Stephenson: Stephenson, '"Real" wages?'; Allen, 'Real wages once more'.

<sup>92</sup> Allen, 'India in the great divergence'; Broadberry and Gupta, 'Indian economic performance'. Indian incomes were probably also lower than in West Africa in that period; see Frankema and van Waijenburg, 'Structural impediments'.

<sup>93</sup> Broadberry and Gupta, 'Early modern great divergence', p. 14, put forth evidence on skilled workers in northern and western India only for 1595, 1637, and 1874.

<sup>94</sup> See also online app. S1.

<sup>95</sup> See *ibid.*

<sup>96</sup> van Zanden, 'Skill premium'.

<sup>97</sup> Broadberry and Gupta, 'Early modern great divergence'; van Zanden, 'Skill premium'.

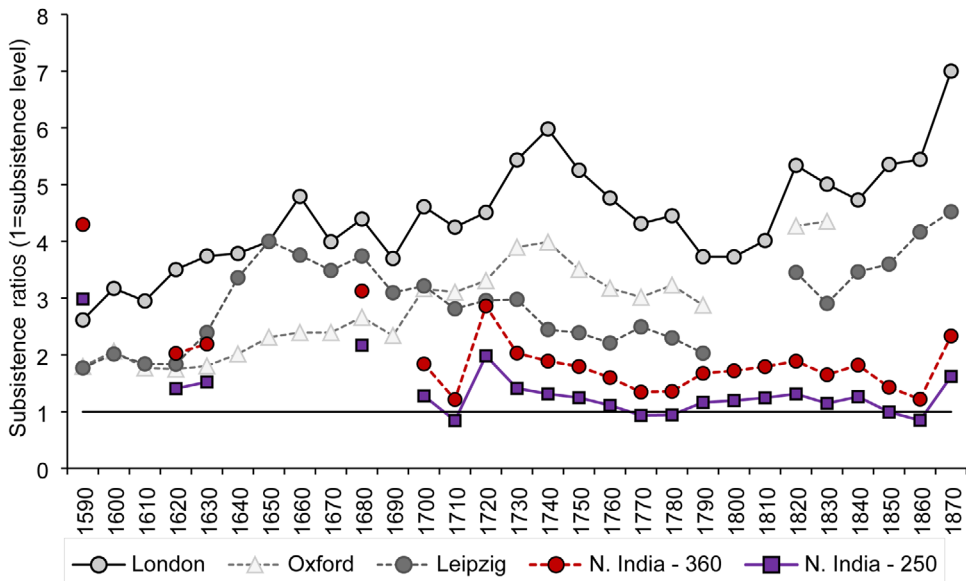


Figure 5. *Subsistence ratios, skilled workers in Europe and India, 1590–1870*  
 [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Sources: Europe: Allen, 'Great divergence in European wages'. India: see sections I and II and fig. 2.

needs to be done to tease out the precise trends in the skill premium in the different Indian regions, as well as investigating the drivers of such trends.

It has thus become clear that both in terms of unskilled and skilled real wages, the divergence between Europa and Asia occurred somewhere in the late seventeenth/early eighteenth century. In the eighteenth and nineteenth centuries, Indian real wages were consistently and substantially below European levels and were more in line with those in China.

### III

Real wages have been criticized as a biased measure due to their focus on the role of the male breadwinner in the household. Therefore the question arises of how family composition and the inclusion of additional income generated by other family members would alter the picture sketched above.

Did Indian families differ in this respect from English families in the eighteenth and nineteenth centuries? Parthasarathi suggests that despite an early age at marriage, Indian families were fairly small and comparable with Europe, partly as a result of infanticide, high child mortality, and early widowhood.<sup>98</sup> He also provides data from an 1822 survey of Bengal, Bihar, and Orissa that reported an average of 5.14 persons per house.<sup>99</sup> A population survey of Burdwan (100 kilometres north-east of Calcutta) from 1816 that enumerates a total of 40,000

<sup>98</sup> Parthasarathi, *Why Europe grew rich*, p. 74.

<sup>99</sup> *Ibid.*

people suggests an average of 5.27 persons per house.<sup>100</sup> At the same time, data on household composition from the Ichapur gunpowder factory in the 1790s shows that a workman's household had on average 3.74 members. This latter, smaller household size may be more accurate for the present study. It seems reasonable to suggest that households in Bengal generally had between four and five members and were thus roughly similar in size to those in England.

The Burdwan survey also provides some more information regarding the age and gender distribution of this population. While it is not entirely clear how representative and reliable these figures are, the numbers are consistent with the findings from other studies on early nineteenth-century demography.<sup>101</sup> If we trust these data, they show that the population was not particularly young, as 31 per cent could be classified as children (below the age of 12 for girls, and below the age of 16 for boys), which is similar to England where roughly 31 per cent of the population was aged between 0 and 14 years in 1696.<sup>102</sup> This suggests either that fertility was roughly at the same level, or that fertility was higher, but that more children died before reaching ages 12–16. The gender ratio in Bengal was balanced, with equal numbers of men and women (perhaps somewhat surprisingly considering the existence of female infanticide).<sup>103</sup>

Most, if not all, studies on real wages have based their historical reconstructions on male day wages. Nonetheless, during most historical periods, women and children also made contributions to household incomes.<sup>104</sup> Two things may drive a bias in the comparison of real wage series based exclusively on male earnings: first, global variance in the male–female/child wage gap, and second, differences in the labour participation rate of women and children.

What matters for international comparisons and the implications for the great divergence debate is Pomeranz's suggestion that in eighteenth-century China 'women's earnings more closely approximated men's than in Europe'.<sup>105</sup> Whereas a Chinese male agricultural labourer employed full time earned about 12 taels, a woman spinning and weaving for 200 days per year could earn 14.61 taels, slightly more than a man.<sup>106</sup> Allen et al. show, however, that even when these female earnings are included, living standards in China were still far behind those in Europe.<sup>107</sup>

We can now include India in this discussion, as we found many women's and children's wages in the sources discussed in section I. Women constituted an important part of the labour force in textile manufacturing, yet most of our sources refer to women working in construction. At building sites, these women (and children) probably prepared lime-mortar and brought it to the masons at work.<sup>108</sup>

<sup>100</sup> Bayley, 'Statistical view'.

<sup>101</sup> As discussed in Parthasarathi, *Why Europe grew rich*, p. 74.

<sup>102</sup> Wrigley and Schofield, *Population history*, p. 528.

<sup>103</sup> Gupta, 'Where have all the brides gone?', p. 13.

<sup>104</sup> de Vries, *Industrious revolution*; Burnette, *Gender, work and wages*; Humphries and Weisdorf, 'Wages of women'; van Nderveen Meerkerk, 'Market wage or discrimination?'.

<sup>105</sup> Pomeranz, 'Political economy', p. 432.

<sup>106</sup> Allen, Bassino, Ma, Moll-Murata, and van Zanden, 'Wages', p. 30.

<sup>107</sup> Ibid.

<sup>108</sup> Moosvi, *People*, pp. 146–7. A construction estimate for Buxar in 1787 explicitly stated that unskilled labourers and their female relatives were occupied with 'preparing mortar and pounding brick dust'; NAI, MBP 25 Sept. 1787, p. 700.



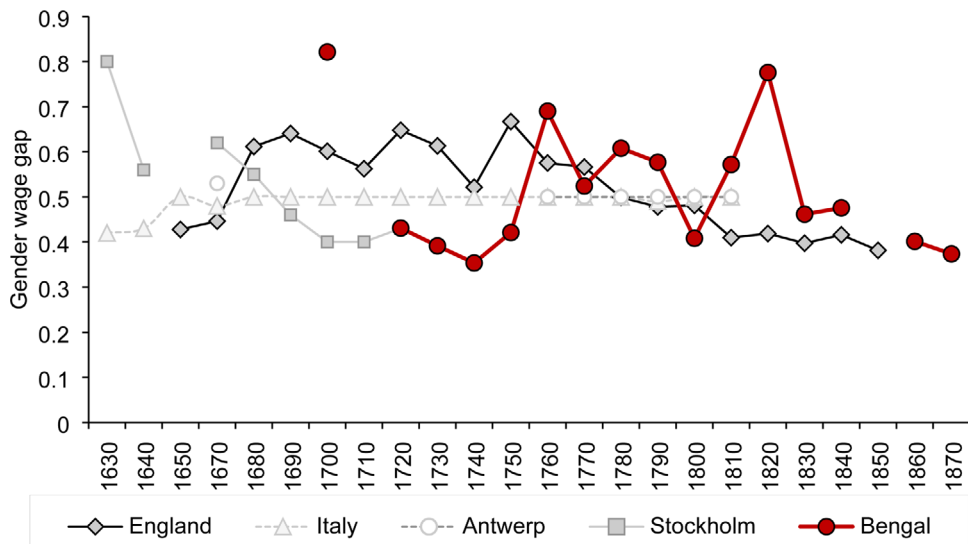


Figure 6. *Gender wage gap in Europe and Bengal, 1630–1870*  
 [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Sources: Bengal: see section I. England: Humphries and Weisdorf, 'Wages of women', pp. 431–2. Italy, Low Countries, and Sweden: de Pleijt and van Zanden, 'Two worlds of female labour', pp. 33–6.

While we have some information on women's wages for Gujarat, Delhi, and Agra, data are most abundant—or least scarce—for Bengal. In order to minimize the impact of compositional effects due to variable data availability for the different regions, we computed a series for Bengal only. We computed gender gaps only for urban unskilled workers (HISCLASS 11) about whom we have most data. From these data it becomes clear that the wage gap was relatively small around 1700. In the first half of the eighteenth century, the gap increased, as women's wages reflected some 40 per cent of the male wage by the mid-eighteenth century. However, this gap decreased quickly towards the 1760s. It became very small again in the 1810s and 1820s, with women's wages reaching some 80 per cent of men's wages.<sup>109</sup> After that the gap again increased in the remainder of the nineteenth century. The large fluctuations in the wage gap may be the result of the relatively limited number of observations on which the female series are based ( $n = 192$ ).<sup>110</sup>

In figure 6, the data on India are compared with the figures on female wages and the gender wage gap for Europe,<sup>111</sup> as developed in recent research by Humphries and Weisdorf on England and de Pleijt and van Zanden on the European continent.<sup>112</sup> Surprisingly, the gender wage gap is generally smaller in

<sup>109</sup> Interestingly, female prisoners in the 1830s received 75–83% of the rice allowance of males (*Report*, 1838, app. 4, p. 154), which suggests that the extent to which women's wages were lower than men's was comparable to the extent to which women's consumption was lower.

<sup>110</sup> See online app. S1.

<sup>111</sup> The gender wage gap is the female wage divided by the male wage.

<sup>112</sup> Humphries and Weisdorf, 'Wages of women', provide two series of women's wages, those for casual employment and those for fixed employments. Since the wages for Bengal were often paid as daily rates, this probably more closely reflects the casual employment series of Humphries and Weisdorf, which is therefore the series employed here for comparison.

Bengal, with the brief exception of the mid-eighteenth century. Similarly to what happened to English women's earnings after the Black Death,<sup>113</sup> the gender wage gap was rather small immediately after the 1769/70 famine in Bengal. A more limited supply of labour as a result of the decline in total population may have strengthened the position of women in the labour market. More research needs to be done to enable greater certainty about the precise trends in the gap and the explanation for those trends. For now, it is important to note that the gender wage gap was not generally larger in India, and in fact, more often smaller than in many places in Europe.

Additional information about the contribution of women to household income stems from Hunter, who quotes information on incomes earned by 'a day labourer with his family, in poor circumstances' in Gaya district (Bihar) in the early nineteenth century.<sup>114</sup> In Hunter's data, the wife and children together bring in almost half of the total household income. This was observed in the period when female contributions to household incomes may have declined substantially as a result of the decline of spinning.<sup>115</sup> We do not know how representative this information is for the wider Indian population, but if it is, this would suggest that their contribution was much more substantial than in Europe, as it has been estimated that in England in the late eighteenth and early nineteenth centuries the contribution of women and children to household income among low wage earners in agriculture was almost 20 per cent, while that of the women alone was about 10 per cent.<sup>116</sup> The relatively high women's wages and large contribution of women and children to household income may explain why Indian families were able to survive, while male wages alone were at levels below—sometimes far below—subsistence.

#### IV

Prompted by debate about the great divergence, the development of living standards in eighteenth- and nineteenth-century India in general, and Bengal in particular, has become a contentious issue in global history. We have introduced a new dataset on wages in India between the late sixteenth and the nineteenth century to shed light on these issues. The dataset contains wage data for many different occupations and refers to many locations across Bengal as well as other towns throughout northern India. We argue that these wage data are taken from a monetized economy, with a functioning labour market, that was structurally not different from other parts of Eurasia. These wages may represent the standard of living for at least part of the lower (landless) income classes in Indian society. These data thus shed light on the great divergence debate as well as contributing to the wider Indian historiography.

To compute long-term trends in real wages—of both unskilled and skilled workers—on the basis of these data and compare these with developments in

<sup>113</sup> See *ibid.*

<sup>114</sup> Hunter, *Statistical account of Bengal*, vol. 12, pp. 76, 97.

<sup>115</sup> Clingingsmith and Williamson, 'Deindustrialization', pp. 219–20. Our data suggest, of course, that women were also active in other occupations.

<sup>116</sup> Horrell and Humphries, 'Women's labour force participation'.

Europe (the economic leader at the time) and China, we created baskets that are sensitive to differences in height, temperature, and local cuisine. These new calculations based on extensive new data and adjusted baskets suggest that a clear gap in living standards emerged between England and India in the late seventeenth century, when real wages dropped in India. The gap widened after the 1720s and further increased after the 1800s. Our extensive new data support, but also specify more precisely, conclusions from earlier research by Allen and by Broadberry and Gupta, who also found that the divergence occurred in the second half of the seventeenth and first half of the eighteenth century.<sup>117</sup> We can now be confident that the divergence was certainly not later than the end of the reign of Aurangzeb (r. 1658–1707). Declining living standards clearly preceded the demise of the Mughal Empire that is generally dated thereafter. More research into sixteenth- and seventeenth-century evidence—for example, from Portuguese sources—will provide further clues regarding earlier developments.<sup>118</sup>

Our evidence does not support claims of comparatively high Indian real incomes in the eighteenth century nor views that suggest the decline was a post-1800 phenomenon, or even a purely colonial phenomenon.<sup>119</sup> The trends in real wages over time thus contain new insights for Indian historiography. The slightly downward trend since the late seventeenth century lasted and wage labourers saw their purchasing power diminish until the devastating Bengal famine in 1769/70. In the face of this evidence, it is very hard to view the eighteenth century as a period of generally rising prosperity across northern India. While scholars such as Alam, Bayly, Marshall, Mukherjee, and Yazdani may have shown rising trade and commercialization, wage labourers clearly did not benefit from it.<sup>120</sup> It is possible that declining agricultural productivity per worker caused food prices to rise faster than wages.<sup>121</sup> While British colonialism may certainly have reduced growth in the nineteenth century and may have had long-lasting negative consequences, it is clear that most of the decline in living standards preceded it. Real wages stagnated in the nineteenth century. This was a period of significant growth in Europe, however, and as a result India came to lag further behind. At the same time, the British colonial authorities systematically tried to reduce wage rates from about 1810 onwards as the proceedings of nearly every meeting of the Military Board testify. Our data suggest that it took them two decades to achieve this.

Finally, these data show that during a large part of the eighteenth century, the male wage in parts of India was not able to sustain a family above subsistence level. This points to the limits of what can be said about developments in living standards based solely on the male wage. In many societies and in time periods, women and children made significant contributions to household income. This also seems to have been the case for northern India, as our sources suggest. Over much of the eighteenth and nineteenth centuries the gap between male and female wages was smaller in India than in England. The important contribution of women and children to household incomes may have allowed Indian families to survive despite

<sup>117</sup> Allen, 'India in the great divergence'; Broadberry and Gupta, 'Early modern great divergence'.

<sup>118</sup> Matos and Lucassen, 'Early Portuguese data'.

<sup>119</sup> See discussion by Roy, *Economic history*, pp. 2–8, 126–8.

<sup>120</sup> Alam, *Crisis of empire*; Bayly, *Rulers, townsmen and bazaars*; Marshall, *Bengal*; Mukherjee, *Political culture and economy*; Yazdani, *India*.

<sup>121</sup> See also Broadberry and Gupta, 'Early modern great divergence'; Gupta, 'Falling behind and catching up'.

low levels of male wages—which plummeted below subsistence level in multiple decades of the seventeenth, eighteenth, and nineteenth centuries. The causes of this low level of income and the decline from the late seventeenth century on should be a subject for further study.

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## Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

### S1. Wage database, northern India, 1590s–1870s

Data and replication files for this article are deposited with the Inter-university Consortium for Political and Social Research: <https://doi.org/10.3886/E118365V1>.