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What is This?
Population, labour and living standards in early modern Ceylon: An empirical contribution to the divergence debate

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In the light of the great divergence debate, the economic history of Asian countries has attracted increased attention in the past decade. This article brings early modern Ceylon (present-day Sri Lanka) into the discourse, providing new quantitative evidence on wages, prices, demography and occupations from the Dutch East India Company archives. It is shown that throughout the eighteenth century, Ceylonese living standards were around subsistence level, lower than in Europe, and, until 1760, China. This can to some extent be attributed to population growth, driven by high birth rates rather than high life expectancies. The occupational structure in the maritime provinces of Ceylon shows that almost one-third of the labour force laboured outside agriculture in 1684, which does not compare favourably with England and Holland. These tentative figures suggest that Ceylon already lagged behind north-western Europe before 1800.

Keywords: Great divergence, Sri Lanka, real wages, demography, occupational structure

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Introduction

The timing and causes of the rise in economic inequality between western Europe and the rest of the world are controversial issues in economic history. The established view suggests that Western Europe had already pulled ahead in the late middle ages as a result of superior demographic, social and institutional structures.\(^1\) This interpretation is backed by estimates of GDP per capita which indicate that living standards in Europe had already exceeded those in the rest of the world long before the Industrial Revolution.\(^2\) Since the late-1990s, this view has come under critique by a number of revisionist scholars, known as the ‘California School’. These scholars argue that the ‘Great Divergence’ occurred only after 1800, and that before that date, Europe and Asia were on the same level of economic development, as measured by various indicators.\(^3\) The California School’s claims continue to be ardently debated. One feature of the debate is that the comparisons between Europe and Asia are based on fragile quantitative evidence. Fortunately, the debate has encouraged scholars to gather more data on pre-modern Asia. While China has attracted the bulk of the attention, and India has also received further interest in recent years,\(^4\) several other regions of Asia have thus far escaped many scholars’ field of vision.

This article contributes by bringing Ceylon (present-day Sri Lanka) into the debate. Ceylon provides an interesting case for the discussion, as the island held a crucial place in the Indian Ocean trade system, and was host to a colonial power as well as an Asian kingdom. The Dutch East India Company (Verenigde Oost-Indische Compagnie: VOC) became the sole European power on the island after expelling the Portuguese in 1658. Ceylon was a crucial possession for the VOC, both due to its strategic position within the Company’s trade network, and because it was the only region in the world that produced an exceptionally fine quality of cinnamon.\(^5\) The VOC controlled an extensive territorial area, the Maritime Provinces, including the former kingdom of Jaffanapatnam (henceforth: Jaffna) in the north and the cinnamon-rich lowlands around Colombo and Galle in the south-west, that was inhabited by at least over 800,000 people at the end of the eighteenth century. The island’s interior, together with some strips of coast on the east and west shores of the island formed the Kingdom of Kandy.

As a commercial company, the VOC employed large numbers of clerks that recorded all sales and purchases, together with other economically interesting

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\(^1\) North and Thomas, *The Rise*.

\(^2\) Allen et al., ‘Wages, Prices’; Maddison, *Monitoring*.


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The controversy over differences in living standards between Europe and Asia holds centre stage in the divergence debate. In the first section, real wages for Ceylon are computed following Robert Allen’s subsistence basket methodology. It is shown that in comparison with north-western Europe and other areas in Asia, Ceylonese living standards were low during the eighteenth century and not much above subsistence level, as the low wages were not compensated by low prices. In the section after that, a reconstruction is made of the demographic developments in Ceylon over the eighteenth century. Most studies in the divergence literature have included demography as an essential variable, yet the precise relationship with economic growth remains contentious. On the one hand, population growth can be interpreted as a sign of a healthy population and economic success and might stimulate technological progress and specialisation. On the other, it can be seen as a cause of poverty as the resources in an economy have to be divided among a greater number of people. These opposing views are hard to reconcile and demographic data thus demand cautious interpretation.

In the final section, an occupational structure of the labour force in maritime Ceylon is derived from VOC census data. Occupational structures provide insights into the degree of specialisation and structural transformation in an economy. A high share of population labouring outside agriculture is associated with high agricultural productivity and the existence of more or less efficient markets and institutions, and thus with high living standards.

**Living Standards**

According to Kenneth Pomeranz, ‘it seems likely that average incomes in Japan, China, and parts of Southeast Asia were comparable to (or higher than) those in western Europe even in the late eighteenth century.' Similar suggestions have

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6 In Dutch: *Overgkomen brieven en papieren uit Indië*.
7 For further elaboration on the Boserupian and Malthusian views, see Livi-Bacci, *A Concise History*, p. 80.
8 Pomeranz, *The Great Divergence*, p. 49.
been made concerning India by others. At the same time, a recent study on the comparative development of real wages by Robert Allen et al. sketches a less optimistic picture of Asian performance before 1800.

This article will follow a similar method, yet as all measures of living standards, real wages have their limitations. First, it has been questioned to what extent wage labourers can be seen as representative for the standard of living of the majority of the population in pre-modern Asian societies. Large parts of the population were engaged in agriculture and received a significant share of their remuneration in kind (food and housing). The section on labour below investigates the degree of wage labour in early modern Ceylon. Furthermore, changes in relative price differences between complementary goods and the introduction of new goods can cause the overstatement or understatement of true price increases. Calculating the cost of living the basis of consumption baskets that represent the minimum for survival, as is done by Allen et al., solves this issue partly. These baskets provide a minimum of 1940 calories per day mainly from the cheapest available carbohydrate in a region, as well as the necessary daily protein intake and some cloth. Nonetheless, this method can understate the true standard of living due to the availability of local cereals and other foods that had a high nutritional value, but were not reported in the sources. Despite these shortcomings, real wages calculated following the Allen et al. methodology still seem best suited to make international comparisons of living standards, especially since data on other indicators of the standard of living in the non-western regions before 1800 are almost non-existent.

To establish the level of nominal wages of Ceylonese workers in Colombo, the Colombo account books, which have survived for the years 1759–1790, are an important source of information. In addition, the ‘General Land Muster Rolls’ are a well-known source for studying the VOC and its personnel. These rolls state monthly wages of the company servants employed at the different VOC establishments in the East Indies, and although they are mostly concerned with the European personnel, Asian servants were also included occasionally. The Muster Rolls were sent to the Chambers of Amsterdam and Zeeland and are still available for the period 1691–1791. For Ceylon, specifically a parallel series of Muster Rolls exists for the period 1694–1778. Finally, some wages could be found in a number of lists and rolls scattered throughout the Ceylon documents.

9 Parthasarathi, ‘Rethinking Wages’; idem., Why Europe; and: Sivramkrishna, ‘Ascertaining Living Standards’.
11 VOC 2985–3979.
12 See for example: LeQuin, Het Personeel.
13 VOC 11534–11705 (Zeeland); 5168–5239 (Amsterdam).
14 VOC 12372–12443.
The wages in these documents reported monthly rates in most cases, but for the purposes of this article daily and annual wages are required. Allen assumes that north-western Europeans (Protestants) worked a maximum of 300 days per year (working 25 days per month) due to religious days.\(^\text{15}\) For the Ceylonese workers, however, the daily wages found in the sources suggested that a month consisted of 27 working days (324 days a year).\(^\text{16}\) Furthermore, the wages were reported in Asian guilders for European employees and Asian rix-dollars for the Ceylonese company servants. These had to be converted into grams of silver, to make international comparisons possible.\(^\text{17}\) Wages were found for a wide variety of occupations, at four intervals in the late-seventeenth and eighteenth centuries. The unskilled labourers are represented by craftsmen’s servants and coolies, while skilled labourers are represented by carpenters, masons, smiths, etc. Table 1 shows monthly wages in guilders. Sinnappah Arasaratnam, an expert on the history of Dutch Ceylon, suggests that a labourer at the lowest end of the wage scale earned 6 guilders per month,\(^\text{18}\) yet in the documents found for this article, this wage occurs less often and was earned by, for example, a book-keeper and a translator; not the average unskilled workers. In addition, in the memoir of Governor van Gollenesse (1743–1751) a monthly wage of one pagoda and a \textit{parra} of rice, which translates into about 7 guilders, is noted for a craftsman at the blacksmiths shop.\(^\text{19}\) Thus, real wages of unskilled labourers in Colombo, Jaffna and

Table 1

\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
 & \textit{Unskilled Wages} & & & \textit{Skilled Wages} & & \\
\hline
Colombo & 3.6/4.8 & 4.7\(^\text{128}\) & 4.8 & 7.2 & 7.2 \\
Galle & & & & 7.2/8.1 & \\
Jaffna & 4.8 & & & & \\
Mannar & 6.48 & & & 8.1 & 8.1 & 7.8 & \\
\hline
\end{tabular}


Note: VOC 2430: In 1738: Sinhalese sawyer earned 1 rix-dollars and 1 \textit{parra} rice per month: 1 rix-dollar = 2.4 guilders. The price of 1 \textit{parra} rice = between 2.69 and 1.90 guilders (2.3); 2.4 + 2.3 = 4.7.

- VOC 1544, f. 1218: the source states that craftsmen earn 1/8 rix-dollar per day and work for 27 days, earning 3 3/8 rix-dollar per month.
- The Asian guilder had the same name as the Dutch guilder, yet differed significantly in value. See Appendix 1 for conversions.
- Stein van Gollenesse, \textit{Memoir}, pp. 91 and 144: one pagoda was about 6 guilders, while a \textit{parra} of rice cost about 1 guilder.
Galle will therefore be calculated on the basis of an unskilled wage of 4.8 guilders per month throughout the eighteenth century, which is also the median of the database containing over 600 wage entries.\footnote{The average wage is 6.5 guilders per month, but this includes significant numbers of skilled workers and high officers.}

It is important to note that these are wages paid by the VOC in Ceylon, yet, the majority of the Ceylonese population did not enter wage labour in the service of the VOC. Nonetheless, there is some evidence suggesting that the VOC wages are representative for the prevailing nominal wage levels in Ceylon. In his description of Ceylon in 1672, the Reverend Philippus Baldaeus wrote that carpenters and masons earned approximately five to six stuivers per day.\footnote{Baldaeus, \textit{Naauwkeurigebeschryvinge}, p. 188.} This is similar to wage found for a carpenter and mason in VOC service in Mannar, earning 3 3/8 rix-dollars per month of 27 working days, which comes down to six stuivers per day.\footnote{VOC 1544, f. 1218: 3 3/8 rix-dollar divided by 27 days is 0.13 rix-dollar (consisting of 48 stuivers) is 6 stuivers per day.} The evidence on non-VOC wages is limited to this observation, but it suggests that VOC wages were in line with those earned by those Ceylonese not in VOC service. Furthermore, these VOC wages were also on a similar level as those found for southern India (see Table 3), making it plausible that this reflects the actual wage level for the area. Until other sources are discovered, the wages shown in Table 1 are the best available evidence available.

To convert these nominal wages into real wages, it is necessary to calculate the cost of living in early modern Ceylon. This involves the creation of consumption baskets that reflect the consumption patterns of the Ceylonese labourers, as well as price series of products in those baskets. Therefore a consumption basket was created that reflects the cost of subsistence (Table 2). The Ceylon basket closely resembles the barebones baskets created by Allen et al. for Europe, China and India.\footnote{Allen et al. \textit{Wages, Prices}; Allen, \textit{India in the Great Divergence}.} Yet, a number of adjustments were made to suit the Ceylonese diet. As in India, rice is the main food staple consumed in Ceylon. Meat and fish are left out of the Ceylon basket, due to a lack of prices and Robert Knox (an English prisoner in Kandy in the seventeenth century) wrote: ‘Beef here may not be eaten; it is abominable: Flesh and Fish is somewhat scarce. And that little of it they have, they had rather sell to get money to keep, than eat it themselves: neither is there any but outlandish men, that will buy any of them.’\footnote{Knox, \textit{An Historical Relation}, p. 138.} The meat and fish have been replaced by extra kilograms of butter and rice, as Baldaeus noted that the Ceylonese ‘have a taste for butter’.\footnote{Baldaeus, \textit{Naauwekeurig ebeschrijvinge}, p. 177.} Sugar is included in the basket, because there is evidence on the use of \textit{jaggory} (palm sugar) in a number of dishes.\footnote{Dewasiri, \textit{The Adaptable Peasant}, p. 87; Knox, \textit{Historical Relation}, p. 141.}

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whereas Allen omitted soap, candles and lamp oil from the Indian basket due to a lack of price series, these have been put back in the Ceylonese basket for three reasons, because: (a) these prices were available; (b) it makes the Consumer Price Index (CPI) dependent on the movement of a greater variety of prices, thereby enhancing CPI quality; and (c) there are no reasons to assume that while people living in the rest of the world were consuming 1.3 kg/litre soap, candles and lamp oil per year, people living in Ceylon were not.\textsuperscript{27} Finally, unlike the European and Chinese baskets, firewood/fuel has been left out of the basket. Again, there are three arguments for this, because: (a) of the lack of price series; (b) the fuel used for heating was minimal, due to the warm climate; and (c) Knox describes that it was one of the women’s tasks to gather firewood in the woods (Ceylon was densely forested),\textsuperscript{28} which implies that no one bought firewood on the market.

These baskets fit the nutritional requirements for one adult male, but to represent the annual budget of a family these baskets had to be multiplied by three, as it was estimated that this increase would be enough to fit the caloric norms for a man, a woman and two young children.\textsuperscript{29} Next to this, a family would have had to pay rent of about 5 per cent of the total budget.\textsuperscript{30} Thus, in order to calculate an annual family budget including rent, the prices of the baskets have to be multiplied by 3.15. A welfare ratio can then be derived by dividing the annual nominal wage of a worker by the annual family budget. When the welfare ratio equals one,

\begin{table}
\centering
\caption{Barebones Consumption Basket Ceylon}
\begin{tabular}{|l|c|c|c|c|c|}
\hline
& \textbf{Quantity per Person per Year} & \textbf{Nutrients per kg} & \textbf{Nutrients per Day} \\
\hline
& \textbf{Unit} & \textbf{Calories} & \textbf{Grams of Protein} & \textbf{Calories} & \textbf{Grams of Protein} \\
\hline
\textbf{Rice} & kg & 165 & 3,620 & 75 & 1,636 \\
\hline
\textbf{Beans} & kg & 20 & 3,383 & 213 & 185 \\
\hline
\textbf{Butter} & kg & 5 & 7,268 & 7 & 100 \\
\hline
\textbf{Sugar} & kg & 2 & 3,750 & 0 & 21 \\
\hline
\textbf{Soap} & kg & 1.3 & & & \\
\hline
\textbf{Candles} & kg & 1.3 & & & \\
\hline
\textbf{Lamp oil} & litre & 1.3 & & & \\
\hline
\textbf{Cotton} & m$^2$ & 3 & & & \\
\hline
\textbf{Total} & & 1,942 & 46 & & \\
\hline
\end{tabular}
\end{table}

Sources: Caloric and protein contents per product taken from: Allen et al., ‘Wages, prices’, p. 38.

\textsuperscript{27} Knox describes the Sinhalese habit of washing both before and after meals: \textit{Historical Relation}, p. 140.

\textsuperscript{28} Knox, \textit{Historical Relation}, p. 147.

\textsuperscript{29} Allen et al., ‘Wages, Prices’, p. 25. This method also fits with 28 per cent (just over a quarter) adult men of the total population, as suggested in the next section.


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\textsuperscript{29} Allen et al., ‘Wages, Prices’, p. 25. This method also fits with 28 per cent (just over a quarter) adult men of the total population, as suggested in the next section.

a man earned just enough to support his family at the subsistence level. Higher values indicate that a man was able to support his family at a higher welfare level, while values below one would mean that the family had to find other ways to augment their income.

Prices for the products in the basket were found in four different types of VOC documents: expense or consumption bills, invoices, account books and so-called *rendementen* (lists presenting evidence on the profits that were made on the sale of goods). The last of these is a particularly rich source as it is available for almost every year throughout the period 1680–1790 and states for which city in Ceylon it gave an overview. In addition, it states the price for which a product was purchased as well as the price for which a product was sold (on the local market). Christiaan van Bochove already compiled most of the price data available through this source.\textsuperscript{31} For the present article, gaps in the database created with those prices were filled by prices found in the other three types of documents. All prices were given in Asian guilder and refer to products per different kind of Dutch early modern units of measurement: for example, mudde, last and pond.\textsuperscript{32} These units were converted to metric ones and prices were converted into grams of silver.\textsuperscript{33} Unfortunately, the data contained significant gaps, which were filled by inter- and extrapolations. Specific details on the conversions and interpolations of the data are discussed in the Appendix 1.

Figure 1 sketches welfare ratios in Colombo, Galle and Jaffna between 1688 and 1790 for unskilled labourers (craftsmen’s servants and coolies). This graph clearly shows that living standards in Ceylon were abominably low. For half a century, between 1709 and the early-1760s, welfare ratios were below 1 for all three cities; suggesting that these people were struggling for survival. Local cereals with high nutrition might have improved the situation somewhat. Yet the great poverty of the indigenous inhabitants of Ceylon around this time is also confirmed in the memoir of Governor Jan Schreuder (1757–1761).\textsuperscript{34} After that, welfare ratios in Galle and Jaffna improved somewhat, although remaining below 1 most of the time, while the ratio in Colombo increased significantly and even reached 1.5 during the 1770s. During the 1780s, rice prices increased as it became harder to obtain rice from abroad (due to political turmoil in Coromandel, a shortage of sailors and higher priority given to rice imports to Surat and Malabar),\textsuperscript{35} leading to declining real wages. Figure 2 demonstrates that Ceylonese living standards were very low, not only in absolute terms, but also compared with

\textsuperscript{31} Available online see: van Bochove: ‘Commodity Prices’.
\textsuperscript{32} For the old Dutch units of measurement and their metric value, see Verhoeff, *De oude Nederlandse* and the appendix.
\textsuperscript{33} See Appendix 1 for conversions.
\textsuperscript{34} Schreuder, *Memoir*, pp. 49 and 67.
\textsuperscript{35} de Silva, *A History*, p. 172.
Figure 1
Welfare Ratios Unskilled Labourers in Colombo, Galle and Jaffna, 1688–1790

Sources: See text.

Figure 2
Welfare Ratios in Ceylon, Europe, China and Japan

Sources: Colombo, see text; Europe, China and Japan: Allen et al., ‘Wages, prices’.

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Europe and, until the 1760s, China. Ceylon is represented by Colombo, as those price series contain the least gaps.

These low Ceylonese living standards resulted from low silver wages (Table 3) and prices that were not much below to the high levels prevailing in London and Amsterdam (Figure 3). Until the 1770s, Ceylon had the lowest silver wages in Asia, and between 1770 and 1790 only southern India had lower silver wages. Workers in southern India could benefit from relatively low food prices, which were either the result of high productivity in rice-growing agriculture, or an abundance of rice arising from geographical factors and a high proportion of the labour force engaged in agriculture. Ceylonese labourers, however, seem not to have shared this benefit of low food prices. In fact, Ceylon was unable to produce enough food for its population, making imports of large quantities of rice from Bengal, Coromandel and Java necessary (and relatively expensive). As noted above, population pressure is a possible cause for poverty; were these low real wages in Ceylon caused by fast population growth, leading to labour abundance (and thus low wages) and a high demand for food (and thus high prices)?

Population

While the link between demographic patterns and economic growth remains controversial, scholars like Eric Jones and John Hajnal have argued that western Europe benefitted from fertility checks, such as late marriage and small family sizes, which led to moderate population growth. Western Europe thus escaped from the Malthusian cycle in which all increases in production were absorbed by

Table 3
Silver Wages (Grams per Day) in Europe and Asia, 1690–1790

<table>
<thead>
<tr>
<th></th>
<th>1691–1710</th>
<th>1711–1730</th>
<th>1731–1750</th>
<th>1751–1770</th>
<th>1771–1790</th>
</tr>
</thead>
<tbody>
<tr>
<td>London</td>
<td>10.52</td>
<td>10.21</td>
<td>10.95</td>
<td>11.14</td>
<td>11.14</td>
</tr>
<tr>
<td>Amsterdam</td>
<td>8.75</td>
<td>8.98</td>
<td>8.98</td>
<td>9.17</td>
<td>9.23</td>
</tr>
<tr>
<td>Leipzig</td>
<td>3.64</td>
<td>3.89</td>
<td>3.42</td>
<td>3.22</td>
<td>2.91</td>
</tr>
<tr>
<td>Beijing</td>
<td></td>
<td></td>
<td>3.26</td>
<td>3.24</td>
<td>3.21</td>
</tr>
<tr>
<td>Suzhou</td>
<td>3.32</td>
<td>3.30</td>
<td>3.28</td>
<td>3.25</td>
<td>3.23</td>
</tr>
<tr>
<td>Canton</td>
<td></td>
<td>3.05</td>
<td>3.04</td>
<td>3.01</td>
<td>2.98</td>
</tr>
<tr>
<td>Kyoto</td>
<td></td>
<td></td>
<td>2.77</td>
<td>2.60</td>
<td></td>
</tr>
<tr>
<td>Southern India</td>
<td>1.44</td>
<td>1.49</td>
<td>1.44</td>
<td>1.44</td>
<td>1.44</td>
</tr>
<tr>
<td>Ceylon</td>
<td>1.37</td>
<td>1.37</td>
<td>1.41</td>
<td>1.46</td>
<td>1.71</td>
</tr>
</tbody>
</table>

Sources: Colombo, see text; Europe, China and Japan: Allen et al., ‘Wages, prices’; Southern India: Broadberry and Gupta, ‘The early modern’.

36 This is a subject of debate: Broadberry and Gupta, ‘The Early Modern’; Parthasarathi, ‘Rethinking Wages’.
37 Arasaratnam, Dutch Power in Ceylon, p. 130; de Silva, A History, p. 171.

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the increase in people. In China, India and other parts of Asia, on the other hand, cultural values stimulated early marriage and large family sizes. Overpopulation and relative land scarcity have been pointed to as causes of the lack of economic development and low per capita incomes in Asia.\(^{39}\) This has been disputed by the revisionists,\(^{40}\) who suggest that although the Asians did not share Europe’s system of late marriage, they had some control over fertility within marriage. Through delaying pregnancy in marriage, and then preventing pregnancy after establishing a family, as well as abortion and infanticide, birth rates per marriage and per women in China, Japan and Southeast Asia “were well below those of western Europe throughout the 1550–1850 period.”\(^{41}\) Prasannan Parthasarathi suggests that despite early age of marriage, Indian family sizes were also fairly small and comparable with Europe, partly as a result of infanticide, high child mortality and early widowhood.\(^{42}\) In this section, some preliminary estimates of demographic

\(^{39}\) See for example, Chao, Man and Land; Elvin, ‘The High-Level Equilibrium Trap’, pp. 137–72.

\(^{40}\) Pomeranz, The Great Divergence; but also Lavely and Bin Wong, ‘Revising the Malthusian Narrative’; Lee and Feng, One quarter.

\(^{41}\) Pomeranz, The Great Divergence, p. 41.

\(^{42}\) Parthasarathi, Why Europe, p. 74.

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developments in pre-modern Ceylon will be made by combining data from secondary literature with numbers from newly found VOC documents.

There are relatively few estimates of the total population of Ceylon during the Dutch period. A crude estimate puts the total Sinhalese population in the mid-seventeenth century in the region of 550,000 to 600,000. While in 1505 a traveller estimated that the population in the South (Galle and Colombo) did not exceed 350,000, and the population of Jaffna was calculated at 200,000 people. This is the same number given by the first Dutch commandant of the Jaffna province immediately after the Dutch conquest in 1658. Jumping forward in time, a census was taken in 1789 which covered all three maritime provinces—Colombo, Jaffna and Galle—and the population enumerated was 817,000. According to N.K. Sarkar, because this census was taken for the purpose of taxation, ‘serious under-enumeration was suspected’. Common belief at the time was that the population of the whole island (including Kandy) was around 2 million, but more educated guesses suggested this number was closer to 1.5 million. Anthony Bartolaccai estimated the population of the Maritime Provinces was approximately 700,000 in 1809. The first population census of the Kandyan provinces was taken in 1821, and the population was found to be 257,000.

Next to these estimates, Jurrien van Goor has assembled data on the total number of indigenous Christians in Colombo, Galle and Jaffna. These figures (shown in Figure 4) were submitted annually by the ministers to the Directors of the VOC or the Synods of the Republic. Figure 4 shows that the number of indigenous Christians in Jaffna rose from 160,000 in the late seventeenth century, to around 200,000 a century later. The increase in the Colombo area was more spectacular, as the number of Christians there increased five-fold, from 20,000 in 1693 to almost 100,000 in 1793. This growth seems to confirm the movement of people towards towns, especially towards important administrative centres such as Colombo, because of economic opportunities. In Galle, the number of Christians reached its high point of little over 90,000 in the mid-eighteenth century, thereafter declining to 60,000 at the end of the century, reflecting its declining importance as a VOC trade hub.

Van Goor warns that, due to the lack of other demographic studies on Dutch Ceylon, these figures cannot be related to other data, and that it is impossible

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43 Roberts, *Caste Conflict*, p. 32.
44 Pieris, *Ceylon and the Hollanders*, p. 3.
45 Arasaratnam, ‘Historical Foundation’, p. 2.
49 Van Goor, *Jan Kompenie*, p. 121.
51 Gaastra, ‘Ceylon als “handelscomptoir”’.  

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to know which part of the population had become exposed to the influence of Christianity. In this article it is attempted to sidestep this problem by relating his numbers to population data for two benchmark years: 1684 and 1789 (see Table 4). The numbers for 1789 are from the census discussed above (keeping in mind possible under-enumeration), while the numbers for 1684 stem from a newly found source in the archives of the VOC, named: ‘Summary of all Company’s subjects’. Proto-censuses similar to this one have been found for other VOC areas in Asia, such as Cochin in Malabar, and Ambon. On Ambon, village heads were required to deliver the detailed data each year to the VOC, while schoolmasters and local VOC officials were ordered to keep an eye on the process. Gerrit Knaap, who has worked with these data, warns that ‘in reality there seemed to be hardly any control on the part of the VOC’. Since the Ceylon census also

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52 Van Goor, *Jan Kompenie*, p. 123.
53 VOC 1396, ff. 602–612: ‘Sommarium van alle ’s Compagnie sonderdanen’ for the separate districts; the former Kingdom of Jaffanapatnam, the Island Mannar, the Dissawany of Colombo (including Negombo and Hapitagam), and the Commandment Galle, which includes Matara.
54 Singh, *Fort Cochin*.

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Table 4
Total Population and Number of Christians in Ceylon, 1684 and 1789

<table>
<thead>
<tr>
<th>1684</th>
<th></th>
<th>1789</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Christians</td>
<td>Total</td>
<td>% Christian</td>
<td>Christians</td>
</tr>
<tr>
<td>Jaffna</td>
<td>155,592</td>
<td>155,592</td>
<td>100%</td>
</tr>
<tr>
<td>Colombo</td>
<td>22,385</td>
<td>54,388</td>
<td>41%</td>
</tr>
<tr>
<td>Galle</td>
<td>38,319</td>
<td>68,118</td>
<td>56%</td>
</tr>
<tr>
<td>Sub-total (Maritime Provinces)</td>
<td>216,296</td>
<td>278,098</td>
<td>78%</td>
</tr>
<tr>
<td>Kandy</td>
<td>–</td>
<td>59,592</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>216,296</td>
<td>817,690</td>
<td>26%</td>
</tr>
<tr>
<td>Total (corrected for underestimation)</td>
<td>–</td>
<td>1,291,087</td>
<td>–</td>
</tr>
</tbody>
</table>

Sources: see text.
Note: The total number of Christians in 1690 actually enumerated 161,863. Therefore assuming some margins of error and growth between 1684 and 1690 it is estimated this number was equal to the total number of subjects in 1684: which was 155,592.
contains information on castes, a possible motivation for the population count might be the rājakāriya system, in which people had to perform services according to their occupational caste or had to pay a land tax. While no unambiguous guarantees can be given regarding the reliability of these censuses, the numbers on, for example, the gender and age distribution of the population, are consistent with data from other sources, as will become clear below.

Combined with sources on indigenous Christians, this source suggests that almost the entire population of Jaffna was Christian. In a census in the mid-eighteenth century, the population of Jaffna was found to be 187,599 according to Arasaratnam, who notes that this ‘seems to include the total Tamil population’.57 Most of these people were Christian only in name, and for the vast majority who were baptised (and thus appeared in the statistics), knowledge of the Christian faith and their adherence to it was nominal.58 Hindu beliefs and practices coexisted alongside Christianity. Many converted to Christianity only because it brought new economic opportunities and material benefits.59 In the two southern provinces, about one half of the population seems to have been converted to Christianity (41 per cent in Colombo, and 56 per cent in Galle). Reliable population estimates for the two cities on the eastern coast, Batticaloa and Trincomalee, are lacking. Van Goor’s sources suggest less than 1000 Christians in the former in the late-eighteenth century, and around 2000 in the latter. It seems unlikely that the population of these cities together exceeded the 10,000 in total.

Regarding Kandy, we are bereft of any population estimates other than those of the British for the early nineteenth century. Because the territory occupied by Kandy in the seventeenth century was larger than during the late-eighteenth century, it is likely that the population exceeded the 285,000 given for 1789 by Sarkar.60 Baldaeus wrote that the King of Kandy could muster an army of 151,086 men.61 In the next paragraphs, it is shown that in Ceylon approximately 28 per cent of the total population consisted of adult men. If we assume that the figure given by Baldaeus constitutes all adult men of Kandy (obviously this is questionable), this would bring the total population of Kandy in the late seventeenth century to 539,592.

Table 4 summarises this discussion. Yet, as noted, these figures are most likely underestimates.62 Based on growth rates and backward projection from the later

58 Arasaratnam, ‘The First Century’.
60 Sarkar, Demography, p. 21: 285,000 is Sarkar’s estimate for 1789 based on the 257,000 from the census of 1821.
61 Baldaeus, Naauwkeurige beschryving, p. 9.
62 The numbers for 1684 are close to estimates by Pieter van Dam, a VOC lawyer, who suggested that the total population of the Maritime Provinces in 1686 was around 278,789. Van Dam, Beschrijvinge, Part 2.2, p. 314.
nineteenth century, Sarkar estimates that the total population in 1789 was around 1,788,000, which has been adopted by Colin MacEvedy and Richard Jones in their *Atlas of World Population History*. In order to arrive at the corrected figure for 1684, the original number was increased by 62 per cent. Compared with total population numbers for Ceylon found for the first half of the nineteenth century, as well as the figure that arises from another source, registers on family composition and landownership, known as *thombos*, for the Colombo province during the 1760s, the corrected figures thus represent an upper bound estimate.

Using this data, demographic developments across time can be calculated in four ways. First, taking 1684 as the main point of reference and assume that the percentage of Christians in each province remains stable over the eighteenth century. Second, it is possible to backward project total population numbers from the year 1789. Third, it can be assumed that towards the end of the eighteenth century the 1789 numbers are more reliable, while at the end of seventeenth century the 1684 numbers are more reliable, and use changing weights over the period to reflect this. Finally, this combined series can be corrected for underestimation. The results of this are shown in Figure 5. Emphasising that these numbers are preliminary estimates based on a number of assumptions and a limited amount of evidence, Figure 5 serves as a first illustration. The most notable drops in the graph, between 1700 and 1710, and between 1760 and 1766, and during the early 1780s coincide with the Dutch–Kandyan wars and Fourth Anglo–Dutch war.

Additionally, the 1684 census and data on indigenous Christians in Galle and Jaffna from the 1690s provide relatively detailed information on the age and gender distribution of the population (Figures 6 and 7). To arrive at the age distribution in Figure 6, it is assumed that the ‘school’ age of boys and girls was roughly the same as in the Netherlands in the seventeenth and eighteenth centuries. Based on literature on education in the Dutch Republic, it was estimated that the school-going age in Ceylon was roughly between 5 and 11, with girls leaving school...
Figure 5

Four Estimates of the Population of Ceylon (in Thousands), 1684–1790

Figure 6

Age and Gender Ratios in the Maritime Provinces of Ceylon, 1684

Sources: See text.

Source: VOC 1396, ff. 602–612.
probably somewhat earlier than boys (this is suggested by the smaller number of school girls, shown in Figure 7). It is unlikely that there was a 100 per cent enrolment rate among the Ceylonese children, but we can assume that those children not going to school are captured by the ‘young men’ and ‘young women’ (these were grouped with the ‘adults’).

The percentages given in Figure 6 for 1684 correspond closely with the figures from the source on indigenous Christians, as well as to those arising from a census of Ceylon from 1821,68 and statistics from the 1830s,69 and 1850s.70 This gives some confidence in the reliability of these numbers. It also points to the limited amount of demographic change in Ceylon over the eighteenth (and early-nineteenth) century. These figures demonstrate that the population of Ceylon in the late-seventeenth century (and thus, probably also during the eighteenth century) was relatively young, as 43 per cent of the total was formed by children

For the 1821 census a total of 595,105 persons were enumerated; of these 349,917 (59 per cent) were above puberty and 316,059 (53 per cent) of these were male and 279,046 (47 per cent) were female. Numbers taken from Roberts, Caste and Conflict, p. 297.

Montgomery Martin, Statistics of the Colonies, pp. 375–76; 1832: total population: 998,259; males: 524,052 (52.5 per cent), females: 474,207 (47 per cent); 1836: total population 1,229,828; males: 645,492 (52.5 per cent); females: 584,336 (47.5 per cent).

British Government Statistical tables: 1850: Total population: 1,575,613; Female: 750,010 (47.5 per cent); Male: 825,603 (52.5 per cent), data for 1851–54 reveal a similar picture.

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aged roughly between 0 and 11, while the group of adults still contain a large amount of people classified as ‘young’ (to compare: in England roughly 31 per cent of the population was between 0 and 14 in 1696).\(^1\) The gender ratio was skewed towards men (53 per cent), although not as much as one might expect in a society where the practice of polyandry (where one woman has several men) was supposedly widespread.\(^2\) The relatively lower number of school girls and young women combined with a high number of widows suggest a significantly lower marriage age for women, which is confirmed by evidence from the thombos.\(^3\)

A number of conclusions can be based on these preliminary estimates. First of all, during the early period of Dutch rule there was only limited population growth (until 1710). Population densities were relatively low as large areas of land were had become depopulated as a result of wars with the King of Kandy. The shortage of labour was resolved by importing slaves from south India.\(^4\) Second, there was a period of relatively fast population growth between 1710 and 1760 leading to population pressure and social unrest in the late-1750s.\(^5\) The Dutch record-keeper noted this population increase and explained it simply by an ‘excess of births over deaths’.\(^6\) Figures 6 and 7 show that Ceylon had a very young population which suggests that population growth was driven by a high amount of births, rather than high life expectancies. Third, there was a period of slower growth from the 1760s to 1790. These three periods roughly coincide with the trends in real wages: rising real wages up to 1710, low real wages between 1710 and 1760, and increasing welfare after that (Figure 8). Nonetheless, Ceylonese population growth was not spectacular in a comparative perspective (Table 5). The ‘combined’ estimate, which shows the highest growth rates, is closer to the trend of Europe (as a whole) and England, than that of China. Moreover, despite labour shortages during the late-seventeenth century, wages were low, suggesting that the low real wages were not exclusively driven by Malthusian dynamics.

**Labour**

Next to demographic patterns, differences in the structure and functioning of labour markets are possible causes of economic divergence. A relatively low share of the population in the primary sector, a high degree of specialisation and high levels of wage labour can be seen as indicators of the existence of more or less efficient

\(^{71}\) Wrigley and Schofield, *The Population History*, p. 528.


\(^{75}\) de Silva, *A History*, p. 165.

Figure 8
Real Wage and Population Estimates in Ceylon, Index: 1745 = 1

Sources: Figures 1 and 5.

Table 5
Population Growth Rates in Ceylon, Europe and China

<table>
<thead>
<tr>
<th></th>
<th>Ceylon</th>
<th>China</th>
<th>Europe</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1684</td>
<td>1789</td>
<td>Comb.</td>
<td>1700–1750</td>
</tr>
<tr>
<td></td>
<td>1750–1800</td>
<td>0.02</td>
<td>–0.01</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>1700–1800</td>
<td>0.02</td>
<td>0.19</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Sources: Ceylon, see text. Europe and China: Lavely and Bin Wong, ‘Revising’; England: Wrigley and Schofield, The population history, p. 529. Average annual growth rate calculation: 

\[ r = \left(\sqrt{\frac{y}{x}} \right) - 1 \times 100 \]

where: \( r \) = the average percentage growth rate; \( t \) = the difference in years (either 50 or 100); \( y \) = total population number around 1700; and \( x \) = the total population number around 1750 or 1800.

Whereas some scholars stressed the modernity of labour markets in western Europe in general, and the Dutch Republic in particular, Pomeranz suggests that China’s labour market came ‘probably somewhat closer’ to a smoothly functioning neoclassical labour market than Europe’s. At the same

78 de Vries and van der Woude, The first; Lucassen, ‘Labour’; van Zanden, ‘Revolt’.

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time, several regions in India enjoyed a relatively small, but highly productive agricultural sector, which fed a large non-agricultural population. In this section, Ceylon’s labour market is explored on the basis of the 1684 census that was introduced in the previous section. The census provides interesting insights into the division of labour in Ceylon, because the population was enumerated according to occupational caste. The data are used to derive an occupational structure of the labour force, and what part of the population was possibly engaged in wage labour is examined.

As noted in the previous section, a possible reason for the compilation of the 1684 census was that people in early modern Ceylon were obliged to perform services either to the Kandyan King or, in the Maritime Provinces, to the VOC, in return for accommodessans (land grants). This system is known as the rājakāriya. What these services encompassed depended on caste; hence the existence of an occupational caste system. The farming castes, the Goyigama in the Sinhalese part and the Vellale in the northern Tamil areas, that formed both the largest and the highest castes, were exempted from these services. Other castes, such as the fisher, washer, carpenter, barber and silversmith castes, etc., had to perform the specific duties attached to their caste. Problematic for putting these occupations/castes into an occupational structure is that, as Alicia Schrikker notes, ‘this does not mean that all members of the castes actually performed this labour, as most people on the island were involved in subsistence agriculture.’ Also in other literature a picture is sketched of pre-modern Ceylon as a predominantly agricultural society, with a majority of the people engaged in subsistence agriculture in which paddy cultivation was the central feature.

Nonetheless, there is also evidence of widespread commercial exchange. The traditional peasant settlements were not completely self-sufficient: some consumer commodities came from distant areas (rice was imported from Bengal, Coromandel and Java), while other essential articles and services made or provided by specialist castes were sometimes unavailable in a village, ‘as the caste-based division of labour extended beyond one single village settlement’. Gerrit Knaap claims that as early as the 1690s ‘hundreds of Sinhalese came into Colombo every day to sell rice, cattle and other food in the market’. There is evidence that

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80 Parthasarathi, Why Europe, p. 70.
81 VOC 1396 ff. 602–612: In some cases the caste name was noted down (for example, vellala and paradesi, both farming castes), in other cases caste was referred to in the Dutch term for their jobs (for example, timmermannen for carpenters, metselaars for masons), and in some cases it was noted down for which services a class of people were used (for example, coolies, ‘used for various services’).
82 Schrikker, Dutch and British, p. 17.
83 de Silva, A History, p. 171.
85 Dewasiri, The Adaptable Peasant, p. 29.

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those parts of Dutch ruled south-west Ceylon that had a surplus of paddy traded with parts that did not produce enough. For example, the cinnamon peeling caste, the *Saligama*, did not produce sufficient rice themselves and thus had to purchase it in Matara. In the contemporary accounts of both François Valentijn and James Cordiner it is suggested that one of the tasks of the women was to go to the market, while Knox wrote that there were no markets, but shops in the cities, 'which sell cloth, rice, salt, tobacco, limes, drugs, fruits, swords, steel, brass, copper, &c'. Commercial exchange was facilitated by the circulation of a wide variety of coins, 'not merely at the higher and more affluent social levels as was the case in most pre-modern societies, but among the ordinary working people'. Trade was not limited to the Dutch areas, as S.B.D. de Silva has demonstrated the existence of a complex system of commercial relations facilitated through monetary exchange in the Kandyan regions. While Chandra R. de Silva observed that as early as the sixteenth century 'there was a substantial circulation of money', and that this was 'certainly not confined to trading centres on the coast'. A close relationship between the circulation of coins and the availability of wage labour can be assumed. S.B.D. de Silva suggests the existence of 'hired labour, i.e. labour working for money wages' in Kandy prior to the arrival of the English. Wage labour was clearly also existing in the Maritime Provinces as Baldaeus mentioned wages of carpenters and masons in Jaffna, and wages for a significant number of Ceylonese workers were found in the VOC documents, as noted above.

Although many of the service and manufacturing castes practised subsistence agriculture alongside their caste occupation, Nirmal Dewasiri suggests that the Company’s high demand for labour also affected the supply, and thereby induced a change of labour relations. Especially in the expanding urban areas, ‘there was a growing tendency for caste-based occupations to be transformed into exclusive sources of livelihood’. This seems to have especially been the case among toddy-tappers, artisans, washers and barbers. At the same time, the *rajakariya* system

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90 Arasaratnam, ‘Historical Foundation’, p. 6.
91 de Silva, *Political Economy*, p. 211.
93 de Silva, ‘Sri Lanka’, p. 50.
95 de Silva, *Political Economy*, p. 223.
96 Baldaeus, *Nauwkeurigebeschrijvinge*, p. 188.

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was transformed into a ‘sort of quasi-wage-labour system’. Governor van Gollenesse notes that a variety of workers ‘for example carpenters, sawyers, hawkers etc.’ did not get *accomodessans*, but received money payments. In late-seventeenth century Jaffna, the required services in the *rajakariya* amounted to only ‘three days in every three months, or twelve days in a whole year’, and it was possible for people to buy themselves out of their service by paying a fine, which was then only 2 stuivers per day. This was significantly below the daily wage and in 1695 as many as 24,641 people paid their fines in Jaffna alone. The resulting labour shortage in various construction projects of the Company had to be resolved by hiring wage labourers. By 1762 the fine had increased to 6 stuivers, but the service remained only 12 days per year. However, according to Arasaratnam, ‘feudal relations’ in the south were far more pronounced and the release from service via the payment of fines was less common.

To what extent labour relations changed and how time was divided between caste-related labour for the *rajakariya*, wage labour and subsistence agriculture differed per caste, time period and region. It is outside the scope of this article to examine this for each caste group, instead the issue is illustrated by two cases: the *Sala* and the *Kara*. While the *Sal*, or *chalias*, produced the most lucrative item on the island, cinnamon, their economic and social position was dire. Cinnamon peeling was part of their traditional obligation in the *rajakariya*. Starting at the age of 12 with a delivery of one *pingo* (62 pounds), the amount a peeler had to deliver increased annually until a maximum of 11 *pingos*, which ‘they must deliver until they are judged to be beyond a state when they can deliver this through old age or sickness; then they can be relieved by the yearly reduction of a *pingo* until they come to one *pingo* where they remain till they die’. The peeling was an arduous task and they frequently failed to deliver the obligatory amount, which steadily increased during the Dutch period, until it came to stage where the *chalias* had to leave their villages and spent for over eight months a year peeling in the forests. In order to avoid the burden, the *chalias* occasionally resorted to violent insurgencies or deserted to Kandy.

The *Kara* fishers, on the other hand, seem to have been a highly mobile and flexible group. Although *Kara* people were classified in Dutch records as fishers, they were not only fishermen. Those who engaged in fishing, did so as a

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100 Stein van Gollenesse, *Memoir*, p. 63.
101 Zwaardecroon, *Commandeur*, p. 22.
full time occupation, and were of course obliged to deliver part of their catch to the company as their rājakāriya. Yet, the Karāva diverted to other forms of employment if this was profitable. For example, the great demand for carpenters in and around Colombo led many of Karāva in the nearby coastal settlement of Moratuwa to turn to carpentry. The Karāva also carried out coastal trading, while demand for inland transport led many to become boatmen on the interior waterways. There are even cases in which they were used to assist in the catching of elephants. Finally, Dewasiri also found an inland village where 29 Karāva families owned substantial patches of paddy-land. The difference between the Salāgama, caught up in an increasingly repressive system of obligatory labour, and the Karāva is striking.

It is against this background that I have attempted to derive an occupational structure of the labour force in maritime Ceylon on the basis of the 1684 census. First, using literature on castes of early modern Ceylon, the many occupations and caste names reported in the census have been brought into 13 groups based on the HISCO tree of occupational groups. For example, the Careas were part of the Karāva, and have thus been classified as fishermen. Second, those groups have been categorised per sector, following the PST system of classification as developed by the Cambridge project on occupational structures. This implies that all the Karāva have been put in the primary sector. The obvious problem that arises is that, as noted above, not all Karāva were fishermen: many of them were carpenters (secondary sector) and boatmen (tertiary). Similar difficulties arise with other groups as well. These problems are, however, not confined to Ceylon: many early-modern European farmers were at the same time employed as weavers in the putting-out system. Thus while some groups in the primary sector were engaged in labour associated with the secondary and tertiary sectors, various groups in the latter sectors devoted part of their time on traditional subsistence agriculture. If this approximately evens out, Table 6 should provide some indication of the occupational structure in the Dutch controlled Maritime Provinces of Ceylon.

111 Dewasiri, The Adaptable Peasant, p. 87.
112 Marco van Leeuwen and Ineke Maas, HISCO.
113 Roberts, Caste Conflict, p. 20;
114 The University of Cambridge project: The occupational structure.
115 E. A. Wrigley, ‘The PST System of Classifying Occupations’, p. 3. Wrigley also goes into more details on other problems that arise when constructing an occupational structure of census data.
116 Household heads were counted because the problem of by-employment in the subsistence and household sector are more acute in the case of women and children: Kumar, ‘The Forgotten Sector’, p. 389.

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These are tentative numbers that most likely understate the size of the primary sector. Yet, with these limitations in mind, Table 6 shows that in 1684 approximately two-thirds of the labour force in maritime Ceylon was engaged in agriculture, 13 per cent in the secondary sector and 19 per cent in the service sector. If the census had included the interior kingdom of Kandy, the primary sector would have been larger: data from the 1830s show that while in the Maritime Provinces 73 per cent of the population laboured in agriculture, this was over 97 per cent in Kandy.

Data on the entire island for the 1830s and 1850s show that the primary sector accounted between 75 per cent and 80 per cent of the labour force. These figures also point to the limited amount of structural change over the eighteenth century (in fact, the size of the agricultural sector increased). Compared with estimates of sectoral distributions of the labour force for north-western Europe, the figures for Ceylon are perhaps not impressive: in Holland already in 1514 only 39 per cent of the population worked in the primary sector, while in England...

### Table 6

<table>
<thead>
<tr>
<th>Household Heads</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming</td>
<td>22,538</td>
<td>29</td>
</tr>
<tr>
<td>Agricultural workers</td>
<td>11,677</td>
<td>15</td>
</tr>
<tr>
<td>Slaves</td>
<td>11,302</td>
<td>14</td>
</tr>
<tr>
<td>Fishers &amp; hunters</td>
<td>6,640</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total primary</strong></td>
<td><strong>52,157</strong></td>
<td><strong>67</strong></td>
</tr>
<tr>
<td>Artisans</td>
<td>5,992</td>
<td>8</td>
</tr>
<tr>
<td>Labourers</td>
<td>3,874</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total secondary</strong></td>
<td><strong>9,866</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>Administration</td>
<td>3,135</td>
<td>4</td>
</tr>
<tr>
<td>Military</td>
<td>6,395</td>
<td>8</td>
</tr>
<tr>
<td>Professional</td>
<td>626</td>
<td>1</td>
</tr>
<tr>
<td>Clerical</td>
<td>355</td>
<td>0</td>
</tr>
<tr>
<td>Merchants</td>
<td>1,974</td>
<td>3</td>
</tr>
<tr>
<td>Service</td>
<td>2,192</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total tertiary</strong></td>
<td><strong>14,677</strong></td>
<td><strong>19</strong></td>
</tr>
<tr>
<td>Unknown</td>
<td>1,394</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>78,094</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Sources: See text. See Appendix 2 for occupational groups; percentages do not add up to 100 percent due to rounding off.

118 Montgomery Martin, *Statistics*, pp. 375–76: 1832: primary 73 per cent, secondary 9 per cent, tertiary, 18 per cent; 1836: primary 78 per cent, secondary 12 per cent, tertiary 10 per cent; *Statistical tables*: 1850: primary 75 per cent, secondary 11 per cent, tertiary 14 per cent; 1851: primary 80 per cent, secondary: 10 per cent, tertiary 10 per cent; 1852: primary 80 per cent, secondary 9 per cent, tertiary 11 per cent. 1853: primary 78 per cent, secondary 12 per cent, tertiary 10 per cent.
119 van Zanden, ‘Taking the Measure’.

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about 32 per cent of the labour force was in agriculture around 1700. However, similar country-level estimates for the same period lack for other areas. Yet, Parthasarathi cites census figures of two areas in Bengal (India) where only 39 per cent (the area of Rangamati in 1775) and only 25 per cent (the village of Sibpur in 1791) of the labour force were cultivators. It is however not clear to what extent these figures are representative for Bengal as a whole. For India as a whole between 1857 and 1900, it has been suggested that approximately 73 per cent of the male workforce was in agriculture. 

Thus, if the proportion of non-agricultural workers in an economy can be seen as an indicator of economic development, Ceylon was less developed than Holland and England, and possibly Bengal. In addition, the comparison of the sectoral distribution of 1684 with figures from the nineteenth century points to a lack of structural change over the eighteenth century. Nonetheless, the examination has also shown that Ceylon was not only a society dominated by service labour and subsistence agriculture. For many people, the amount of services that had to be fulfilled in the rājākāriya seems to have been limited, and almost one-third of the labour force in the Maritime Provinces (also) laboured outside agriculture.

**Conclusion**

Stirred by the debate on the economic divergence between western Europe and Asia, the comparative performance of pre-modern Asian economies has attracted special attention in the past decade. This article brought eighteenth century Ceylon into the debate, providing new quantitative data on population, labour and living standards from the Dutch East India Company archives. The numbers presented here are tentative. No clear-cut guarantees can be given regarding the reliability of the census data, while the wage and price data contain significant gaps. These figures are not the final word on eighteenth century Ceylon, and more research, which could confirm or refute the picture sketched by these preliminary estimates, is encouraged. Nonetheless, some estimates fit quite well with some other data and qualitative primary sources. Therefore, and considering the general paucity of information on early modern Ceylon, it is interesting to see what picture these data sketch.

The exploration of wages and prices has demonstrated that Ceylonese standards of living were comparatively low in the late-seventeenth and eighteenth centuries. Silver wages were low, while prices were relatively high as agricultural production was too low to produce enough food for the entire population.

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120 Mokyr, *The Enlightened Economy*, p. 15.
123 As Knaap also admitted for his data on Ambon: Knaap, ‘The Demography’.

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making imports of large quantities of rice from Bengal, Coromandel and Java necessary and relatively expensive. These low living standards, also in global perspective, may to some extent be attributed to population pressures. Rather than high life expectancies, population growth was driven by high birth rates as is suggested by the high share of children in the total population. At the same time, periods of labour shortages, when slaves were imported from Southern India, did not lead to high living standards. The examination of the occupational structure in maritime Ceylon has shown that roughly one third of the labour force was engaged in the secondary and tertiary sectors in 1684 and that there was little structural change over the eighteenth century. While this does not compare favourably with England or Holland, it does contest the picture of an economy solely dominated by subsistence agriculture and service labour. Nonetheless, it can be concluded that eighteenth century Ceylon fits with the established view in the Great Divergence debate; namely that, measured by various indicators, Ceylon already lagged behind north-western Europe long before 1800.

Appendix 1

The data used in this article to sketch developments of nominal wages, prices and to calculate real wages in Ceylon will be made available on the Historical Prices and Wages Website of the International Institute of Social History: http://www.iisg.nl/hpw/ and the website of the Global Price and Income History Group: http://gpih.ucdavis.edu. Details on conversions and inter- and extrapolations are given below.

Silver value per guilder: 9.8 grams of silver up to 1680 and 9.61 grams of silver from 1681 onwards. Source: Jan Luiten van Zanden, ‘Prices and wages’.

The value of the guilder used by the VOC in Asia was lower than the guilder in the Dutch Republic and the Asian currency was therefore referred to as ‘light money’. The value of the Asian relative to the Dutch guilder fluctuated throughout the seventeenth and eighteenth centuries. According to Els Jacobs one Asian guilder was worth 20 per cent less than the Dutch guilder prior to 1743; 16.35 per cent less between 1743 and 1768, while after 1768 the value differences disappeared (see Table A1).

<table>
<thead>
<tr>
<th>Period</th>
<th>Expressed in Dutch Guilders</th>
<th>Expressed in Grams of Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1670–1681</td>
<td>0.80</td>
<td>7.84</td>
</tr>
<tr>
<td>1682–1742</td>
<td>0.80</td>
<td>7.69</td>
</tr>
<tr>
<td>1743–1768</td>
<td>0.84</td>
<td>8.04</td>
</tr>
<tr>
<td>1769–1790</td>
<td>1</td>
<td>9.61</td>
</tr>
</tbody>
</table>

Sources: See text.

Table A1

Value of One Asian Guilder


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Wages: only a few daily wages were found. Yet, in a few cases both daily and monthly rates were reported (for craftsmen and servants) and these suggested that a month consisted of 27 working days. The monthly rates found for the rest of the period suggested that wage rates remained stable throughout the period. These rates were converted to grams of silver according to Table A1.

Rice: for Galle and Jaffna the rice series were extrapolated with the price series of paddy using the following equations:

1. Galle: \[ p \text{ RICE} = 2.7164 \ p \text{ PADDY} - 0.0668 \quad R^2 = 0.4573 \]
2. Jaffna: \[ p \text{ RICE} = 2.0548 \ p \text{ PADDY} - 0.0139 \quad R^2 = 0.6414 \]

Beans/peas: prices of both beans and peas were found, given per Dutch pound of 0.494, or given per parra of 40 Dutch pounds. There were, however, big gaps in the price series of beans and peas, especially for Jaffna and Galle. Because there was no correlation found between the movement of these prices and the prices of other products, these gaps were filled by linear interpolation. The overall declining trend in prices for beans however seems similar across cities, also in a number which have been omitted from this study.

Butter: prices for various types of butter could be found in the sources. The butter from Mannar, which is situated in Ceylon, was the cheapest and therefore preferred in the price series. In year for which no prices of Mannar butter could be found, the cheapest alternative was chosen to replace it (butter from the Cape or Bengal). Prices were given per pound of 0.494 kg.

Sugar: two types of sugar were frequently mentioned in the sources: rock candy and powdered sugar. For creating the price series, powdered sugar was used since it was the cheaper of the two. These prices were written down per Dutch pound of 0.494 kg.

Soap: prices of soap (from Surat) were noted down per stone. A stone could be 8 or 6 pounds; due to the low prices of a stone of soap, it was assumed that the stones in Ceylon were only six pounds.

Lamp oil: price of lamp oil were given per kan, which contained 1.51 litres. Because the sources stated that klappus oil served for illumination at night, and that coconut oil was similar to lamp oil, prices of these three types of oil were put together in one price series lamp oil.

Candles: prices for candles, or ‘wax for the making of candles’, were given per Dutch pounds of 0.494 kg. Gaps were filled by linear interpolation.

Cotton: A number of different types of cotton cloths were found in the sources, for example, salempoeris, baftas, and gingham. Because most prices were found for the gingham, and because the gingham was one of the cheaper varieties, those were used to create price series for cotton. A gingham had a length of 17 gaz and 18 tussus, and a width of 22 tussus; one gaz was 67.31 cm and a tussus 2.805 cm. Thus, a gingham was 12.1329 meter in length and 0.6171 meter in span. The price per m² cotton could thus be calculated:

\[ p \text{ COTTON m}^2 = p \text{ GINGHAM}/(12.13 \times 0.62) \]

125 Conversions of weights and measures taken from: Verhoeff, *De oude Nederlandse*.


*The Indian Economic and Social History Review*, 49, 3 (2012): 365–98
In addition, prices for two types of ginghams were found: the normal gingham and the fine gingham. The normal gingham, which was the cheaper of the two, was used to create the time series, yet the fine gingham, for which more prices were available, was useful to extrapolate the normal gingham series, using the following equations:

1. Colombo: \[ p_{\text{NORMAL}} = 0.6603 \, p_{\text{FINE}} - 11.948 \] \[ R^2 = 0.6873 \]

2. Galle: \[ p_{\text{NORMAL}} = 0.4494 \, p_{\text{FINE}} + 7.3635 \] \[ R^2 = 0.6475 \]

3. Jaffna: few prices of both types of ginghams: therefore: first extrapolating Jaffna fine gingham by the Colombo gingham.

\[ p_{\text{FINE}} = 1.7052 \, p_{\text{COLOMBO}} + 8.5763 \] \[ R^2 = 0.6937 \]

The price of a normal gingham was on average 45 per cent lower than the fine gingham: \[ p_{\text{FINE}} \times 0.55 = p_{\text{NORMAL}} \]

**Appendix 2**

The occupational groups in Figure 5 were based on the HISCO tree of occupational groups: http://historyofwork.iisg.nl/major.php. In this appendix it is noted which workers (as found in the sources) are included in which groups, and in which sector (according to the PST system).

**Primary Sector**

6: Agricultural, animal husbandry and forestry workers, fishermen and hunters:

Farmers: *vellala, paradesi, maddapalli, and agamudaiyan,* (these were Tamil cultivators’ castes)\(^{127}\) and cattle farmers.


Slaves: in Galle and Colombo, these were written down simply as ‘slaves’, while in Jaffna there were four types of slaves: *nallua* (slaves), *palla* (‘buitenslaven’, outside slaves’), *coria* (house slaves) and *heijdenseslaven* (non-Christian slaves).

Fishers and hunters: *carea, moeckia* and *timmulae* (fishermen); *badda* and *pattangatty* (overseers of the fishermen); *barimbas* (sailors) and *paravar* (pearl fishers); hunters, *badamas, marrigares, tammekares* and *pannikias* (elephant hunters) and *cornacx* (elephant riders).

**Secondary Sector**

7/8/9: Production and related workers, transport equipment operators and labourers:

Various artisans: butchers, carpenters, coppersmiths, masons, painters, potters, shoemakers, silversmiths, smiths, leather workers, lime burners, salt and arrack makers, and weavers.

Labourers: coolies, olias, bailedoors (sources note these ‘were used for various services’).

**Tertiary Sector**

0/1: Professional, technical and related workers: jurists, accountants (borrewijs), priests, teachers and merinjos (assistant teachers).

2: Administrative and managerial workers: adigars, appuhamy, attacorle, mudaliyar, raalens, vidanes, reformadosse (all of these were headmen on various positions, high and low).

3: Clerical and related workers: canneappulls (bookkeepers), writers and messengers.

4: Sales workers: chetties (trading-caste, of South Indian origin) and moors (Muslim traders from India).

5: Service workers: tarumbas, hunnewas, maijnotos (all of these are washers) and pedias ( overseers of washers), barbers.

Military service: mudaliyars (officers), arachie and canganes (corporals), lascarins (soldiers), tablinjero and berrewaijs (drummers) and horn blowers.

**Unknown**

For Jaffna this includes people noted down as: cripples, beggars, and toepasses (Portuguese speaking people). For Colombo this includes: Mallabars, Bengalis, Chinese, toepasses, and widows. For Galle this includes babies, widows, free Mallabars, pilgrims and those written down as ‘brothers and friends’ of other population groups. This is thus still a problematic group, as it includes both productive and unproductive peoples, while regarding the productive people it is unclear what they are doing.

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