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# **Falling Behind and Catching up: India's Transition from a Colonial Economy**

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## **Abstract**

India fell behind during colonial rule. The absolute and relative decline of Indian GDP per capita with respect to Britain began before colonization and coincided with the rising textile trade with Europe. The fortune of the traditional textile industry cannot explain the decline in the eighteenth century and stagnation in the nineteenth century as India integrated into the global economy of the British Empire. Inadequate investment in agriculture and consequent decline in yield per acre stalled economic growth. Modern industries emerged in and grew relatively fast. The reversal began after independence. Policies of industrialization and a green revolution in agriculture increased productivity in agriculture and industry. However, India's growth in the closing decades of the twentieth century has been led by services. A concentration of human capital in the service sector has origins in colonial policy. Expenditure on education prioritized higher education creating an advantage for the service sector. At the same time, the slow expansion in primary education lowered accumulation of human capital and put India at a disadvantage in comparison with the fast-growing East Asian economies.

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At midnight of 15<sup>th</sup> August 1947, India became an independent country. It ended 200 years of colonial rule.<sup>2</sup> It altered the borders of India. Two distinct regions from the Western and the Eastern sides were carved out as a separate political entity of the state of Pakistan.<sup>3</sup> Indian independence also led to a major change in the direction of economic policy. From a globalized economy integrated into the British Empire, the next 30 years saw a retreat from policies of free trade and capital flows. The newly independent state embraced the idea of development through industrialization. In an economy, where capital was scarce and entrepreneurship was concentrated in a few communities, the state stepped in to fill the gap. India was not unusual in this. Many parts of the underdeveloped world, both colonies in Asia and independent countries in Latin America moved towards protectionist policies to develop an industrial sector. This was not simply the infant industry argument, which had characterized industrialization in the United States and Europe nineteenth century. The role of the state in the newly independent countries, in the second half of the twentieth century, was developmental and directly interventionist. While the industrialized world in Europe and North America began to rebuild the institutions of free trade after 1945, the underdeveloped world moved in a different direction, where the idea of a “Developmental State” became an intrinsic part of policy making.

This article will take a long run view of Indian economic development. I will start with Mughal India under the emperor Akbar in 1600. This was the high point of economic prosperity measured by average living standards. The article will look at the changes in the economy over the next 400 years, first in response to increasing trade with Europe through the global network of European trading companies, then through the formal political rule of the East India Company and the British Crown and finally the new phase of development after independence. As the title suggests, it will argue that there is a story of falling behind over a long period in which Indian GDP per capita declined or stagnated, a trend only to be reversed after independence. India fell behind in a period of increasing integration into the global economy.

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<sup>2</sup> The term colonial rule is used to describe the period of political control from 1757 to 1858 by the English East India Company, a monopoly trading company operating with the charter of the British crown and the period of crown rule from 1858 to 1947. Policy making in India during this entire period was in the hands of British interests.

<sup>3</sup> In this article, the term India will refer to different geographic regions before and after the partition. It will refer to the united regions of India and Pakistan under the common term of British India and will mainly refer to the India as a nation state after independence.

The economy began to catch up as post-independence India retreated from globalization. reversal of

The analysis touches on the broader theme of the effect of colonization. Niall Ferguson, in his well-known book, *Empire: How Britain Made the Modern World* saw the integration into the global economy as a positive factor that increased trade and saw developed of the railways. To quote Ferguson:

Average incomes rose by only 14 percent between 1757 and 1947, while British incomes rose by 347 percent.... Even if Indian incomes did not increase, things might have been much worse under a restored Mughal regime in 1857 had the Mutiny succeeded.<sup>4</sup>

Others have seen integration into global economy as an aspect of colonial exploitation. Ideas of “development of underdevelopment”<sup>5</sup>, “world systems”<sup>6</sup> and “unequal exchange”<sup>7</sup> for primary producers involved in colonial exchange, have been influential in the discourse on the adverse impact of colonization. Prebisch and Singer<sup>8</sup> provided empirical evidence to suggest a long-term decline in terms of trade between agricultural and industrial products. Work by Indian historians have emphasized colonial connections as means of exploitation with adverse consequences on growth and development.<sup>9</sup>

Neither strand of the literature is based on systematic evidence on wages and incomes. This article puts together quantitative evidence on indicators of living standards and economic growth to understand empirically the fortunes of this important Asian economy. I will argue

1. Integration into the world economy did not change the economic fortunes of colonial India. Rising trade in textiles in the seventeenth and eighteenth centuries, coincided with declining incomes. Faced with rising imports of industrial goods from Britain, industrial output declined from 1800 and exports of agricultural goods increased, but the economy did not move into the stage of modern economic growth. Underinvestment in agriculture and stagnation in agricultural productivity can explain why this colonial economy fell behind.
2. Retreat from a global economy after independence saw a change in economic policy towards industrial development. Planning for industrialization in independent India wiped

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<sup>4</sup> Ferguson, *Empire: How Britain made the modern world*, pp. 217-8

<sup>5</sup> Frank, *The Development of Underdevelopment*.

<sup>6</sup> Wallerstein, *The modern world-system*

<sup>7</sup> Amin, *Unequal Development*.

<sup>8</sup> Prebisch, ‘The economic development of Latin America’

<sup>9</sup> Bagchi, *The political economy of underdevelopment*, Dutt, *Economic History of India*.

out to a large extent the colonial legacy as it set up industries producing intermediate and capital goods under public ownership.

3. The post-independence years saw a green revolution in agriculture and planned industrialization and these interventions moved the economy from stagnation to modern economic growth. The slow growth in the post-independence decades is a relative failure in the context of the rapid growth in East Asia, but a reversal in the context of the long run trend during colonial rule.

4. In 1947 less than one- fifth of the Indian population had basic literacy. Although literacy had risen in the first half of the twentieth century, India's primary school enrollment was one of the lowest in the world. At the same time, the relative share of secondary education was high. Colonial education policy had long run consequences. India's recent growth led by the service sector has relied on the large pool of workers with secondary and tertiary education, but the industrial sector still has a high share of workers with low human capital.

### I *Falling Behind*

The earliest systematic evidence on economic wellbeing of the Indian population comes from the carefully collected data by Shirin Moosvi based on the writings of Abul Fazal, a member of Akbar's court, in 1595.<sup>10</sup> At this point, the average living standard was well above subsistence. A comparison of wages of unskilled urban workers in 1595 and 1961, show that purchasing power of wages under Akbar was higher.<sup>11</sup> This is supported by evidence on higher land productivity. Desai shows that for most crops, yield per acre was higher in 1595 compared to 1910.

The time line of this decline can be seen from Broadberry and Gupta's (2006) series on urban unskilled wages from different parts of India from 1600 to 1870. Using the price of the staple food crop, they constructed the grain wage as an indicator of real wage.<sup>12</sup> In 1600, the grain wage in India was over 80 per cent of the British wage. The trend shows decline during the seventeenth and eighteenth centuries and stagnation in the nineteenth century. (See Figure 1) Their conclusion is supported by evidence on real wage constructed with Allen et al's much

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<sup>10</sup> Moosvi, *The Economy of the Mughal Empire*.

<sup>11</sup> Desai, 'Population and standards of living in Akbar's time'

<sup>12</sup> Broadberry and Gupta, 'The early modern great divergence'

improved consumption basket for the nineteenth century.<sup>13</sup> The average Indian lived at bare bones subsistence from the middle of the eighteenth century to the middle of the twentieth century.

The picture based on grain wage or real wage refers to the urban economy and may provide a distorted view of an economy that was primarily agricultural. To reflect the economic conditions of the entire economy, Broadberry, Custodis and Gupta estimated GDP per capita using methods from historical national accounting.<sup>14</sup> The trend in GDP per capita is in line with the trends in wages. India began to fall behind from the middle of the seventeenth century. In 1600, Indian GDP per capita was 60 per cent of British GDP per capita and well above Maddison's subsistence annual income of \$400. But Indian per capita GDP declined absolutely and relatively as shown in figure 2. The Great Divergence began partly due to India's decline and partly due to British Growth. The decline of the urban grain wage and estimated GDP per capita is at odds with the picture of a buoyant urban economy as shown in the work of Bayly.<sup>15</sup> While specific communities benefitted from trade, the high point in the average income before modern economic growth in India was under Akbar in 1600. Indian living standards declined in the eighteenth century and stagnated in the nineteenth century. In the following sections, we look for explanations.

### *Textile trade and deindustrialization*

Trade is seen as a driver of economic growth.<sup>16</sup> Recent work by Pascali however, finds that in the first phase of globalization, 1870 to 1914, not all countries gained from globalization and trade may have contributed the Great Divergence.<sup>17</sup> Indian experience supports Pascali's finding. The rising trade in seventeenth and eighteenth centuries, as the country came into contact with European trading companies, did not create prosperity. In fact, the increase in trade coincided with declining living standards. The following section discusses what led to the rise in trade and how important trade was to the economy.

The English East India Company acquired trading rights from the Mughal Emperor in 1612 as a monopoly trading company from Britain. So did other European companies. India was the

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<sup>13</sup> Allen *et al.*, 'Wages, prices, and living standards'

<sup>14</sup> Broadberry *et al.*, 'India and the great divergence'

<sup>15</sup> Bayly, 'Rulers, Townsmen and Bazaars'

<sup>16</sup> Frankel and Romer, 'Does trade cause growth?'

<sup>17</sup> Pascal 'The wind of change'

main producer of cotton textiles, that was in high demand in Europe. The European trading companies bought textiles in India and traded it for spice in South East Asia. Large quantities of the textiles were sold in the European market. Calico and Muslin symbolized a consumption revolution in Europe<sup>18</sup> Trade with the English and Dutch companies, the two main players in this market, grew rapidly.<sup>19</sup>

The European Companies struggled to find a suitable import to pay for textile exports. The only commodity which was in great demand in India was bullion. There were large inflows of bullion into India. It was only after the English East India Company gained political control of Bengal 1757 by defeating the ruler of Bengal, the bullion inflow ceased. Land taxes raised by the company could now be used to pay for textiles. The competitive advantage of Indian textiles in the international market came from the skills of the weavers, the quality and design of cotton cloth and the low wages of the textile workers. The textile industry based on simple technology saw very little change over the two centuries<sup>20</sup>, but it dominated global markets right up to the end of the eighteenth century.

Although the East India company solved the problem of paying for exports, the textile market was to face a major shock that destroyed its position in the international market. This was the British industrial revolution. Producing cotton cloth with Indian technology was not profitable in Britain as the money wage in Britain were five times the Indian wage. The labour saving technology of the industrial revolution changed this. Productivity gains made with the new machines made prices of cotton textiles tumble. As productivity continued to increase, wage advantage of Indian products began to disappear, first in the British markets, next in third markets, where Indian goods competed with British goods and finally in the Indian market.<sup>21</sup> British goods began to displace local products in India from the middle of the nineteenth century. Ray argues that handloom products became uncompetitive with the textile goods of the industrial revolution and colonial commercial policy had little to do with the entry of British goods in the Indian market.<sup>22</sup>

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<sup>18</sup> Berg, 'In pursuit of luxury', Lemire and Riello, 'East & west: Textiles and fashion'.

<sup>19</sup> Chaudhuri, *The Trading World of Asia*, Chaudhuri, *From Prosperity to decline*, Prakash, *The Dutch East India Company*

<sup>20</sup>Habib, 'Notes on Indian textile technology'

<sup>21</sup> Broadberry and Gupta, 'Lancashire, India, and shifting competitive advantage'

<sup>22</sup> Ray, 'Identifying the woes of the cotton textile industry'

One of the most dramatic technological change was in spinning. It took 10,000 operative hours to spin 100 lbs of cotton in India. Crompton's mule, one of the first machines of the industrial revolution in 1780, did this in 2000 operative hours. By 1825, the number was down to 125 with Robert's automatic mule.<sup>23</sup> Indian yarn had lost their competitive edge well before cotton cloth, where the technological change was slower. Indian weavers substituted home produced yarn with cheaper and more durable imported yarn well before the Indian weaving industry took its first hit from imports.

The share of Indian textile products in domestic consumption declined between 1830 and 1880.<sup>24</sup> The decline in industrial output and employment over the nineteenth century India has been known as *deindustrialization*.<sup>25</sup> Thousands of textile weavers lost their livelihood. Bagchi estimated a decline in industrial employment in Bengal from 21 per cent in 1801 to 9 per cent in 1901.<sup>26</sup> Ray's estimates show a decline of 28 per cent.<sup>27</sup> The share of industry and commerce in GDP declined.<sup>28</sup> Urbanization declined from 15 per cent to 9 per cent over the nineteenth century. From an industrial exporter, India slowly integrated into the global economy of the British Empire as an agricultural exporter. British imports were 60 per cent of domestic consumption in 1880. Per capita consumption increased as imported cotton cloth was cheaper.<sup>29</sup> With the development of a modern textile industry after 1880, Indian textile producers gradually began to recover market share. The traditional industry survived and even prospered in niche markets.

While Indian textile exports had dominated the world market, industry in India had never been the dominant sector of the economy. Employment in the export sector in Bengal has been estimated to have been 11 per cent of total employment in 1750.<sup>30</sup> Bengal was the most industrialized part of the country and the main source of exports by early eighteenth century. The massive growth in industrial exports between 1750 and 1800 was no mean achievement,

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<sup>23</sup> Derived from Catling, H., *The spinning mule* (Newton Abbot, 1970) in Broadberry and Gupta, 'Lancashire, India, and shifting competitive advantage'

<sup>24</sup> Bagchi, 'Deindustrialization in India in the Nineteenth Century', Ray, *Bengal industries*, Twomey, 'Employment in nineteenth century Indian textiles'

<sup>25</sup> Clingingsmith and Williamson, 'Deindustrialization in eighteenth and nineteenth century' terms the industrial decline as weak *deindustrialization* and emphasize the importance of supply side changes in the eighteenth century due to wars and weather shocks that moved the terms of trade against industry.

<sup>26</sup> Bagchi, 'Deindustrialization in India'

<sup>27</sup> Ray, 'Identifying the woes of the cotton textile industry'

<sup>28</sup> Broadberry *et al*, 'India and the great divergence'

<sup>29</sup> Roy, 'Economic history of India', p.66

<sup>30</sup> Prakash, O. 'Bullion for Goods'.

but its impact on per capita GDP was small. (Figure 3A) Indian GDP per capita declined even when textile exports increased. Figure 3B shows that per capita GDP tracked per capita agricultural output, not per capita industrial output. The share was agricultural output in GDP in 1800 was over 60 per cent. The thriving world of Indian trade and commerce barely touched the vast majority of people. In the nineteenth century, the rising trade in agricultural products coincided with a stabilization of GDP per capita and even a small increase. (See table 1) Deindustrialization caused unemployment among textile weavers and drove many back to agricultural occupations. But it did not have a big impact on the average living standard.

### *Globalization and Specialization in Agriculture*

The battle of Plassey in 1757 marked the beginning of British rule in Bengal. The right of taxation passed from the Nawab of Bengal to the East India Company. The Company set out to change the land revenue system to create what they perceived as “well defined property rights”. The “Zamindari” or landlord system was introduced in 1793 in Bengal that gave the land owners property rights in land and made them the taxpayer. The cultivators were to pay a rent to the landlord, who in turn paid taxes to the Company. The rate of tax fixed in perpetuity in 1793 was a way to incentivize the landlord to improve land productivity and become the entrepreneurial landlord.

The system did not work as planned and created a class of absentee landlords, who spent their wealth on conspicuous consumption. As the Company gradually expanded its rule to the rest of India, it introduced an alternative system of taxation, by directly taxing the cultivator, who also became the legal owner. The tax rate was a proportional to output and was in principle subject to change. The non-landlord systems were introduced in the western and northern parts of India. In this system, the state had a greater incentive to improve land productivity. The cultivators were too poor to undertake large improvements of land.

In 1858, when India came under Crown rule, the East India Company looked more like a ruler than a trading firm with well-defined objectives of raising revenue and expenditure. The transition to the Crown rule did not introduce major changes to the revenue structure, but it integrated India formally into the global economy of the British Empire with far reaching implications for trade, capital flows and migration.

The volume of trade increased from the middle of the nineteenth century, but the composition changed. From an exporter of textiles, India became an exporter of agricultural products, supplying raw materials to Britain and importing manufactured goods. (See figure 4) The figure shows that in 1850, opium was the single largest export, mainly sold to China to buy tea for export to Britain. The opium trade became a symbol of the exploitative aspect of colonial trade. India exported mainly agricultural goods, with opium declining in importance and raw cotton and food grains playing their part in the Empire trade.

In the Indian balance of payments, a category called *home charges* appeared as an outflow from India to Britain, which was paid to Britain partly for debt service and partly as the cost of administration and security of the colony. It has been largely seen as *drain of resources* from India and the cost of colonization.<sup>31</sup> At the same time, India also became a recipient of British capital flows. This was small relative to total capital flows from Britain to the rest of the world. Most of this went to the railways. Industry had a very small share. British private investors, bought shares in companies set up in India. The main industry that developed with British capital was tea, largely an empire good sold in the British market. There were large flows of migration in the integrated world of the British Empire. Thousands of indentured workers migrated to distant parts of the Empire to work on plantations, mines and railway construction in the post slavery world facing labour shortage. They worked in British owned sugar plantations in the Caribbean, Fiji and Mauritius, tea plantations in Ceylon and in mines and railway construction in South Africa.

#### *Agricultural Stagnation*

The globalized economy of colonial India did not see sustained growth. The income gap with Britain widened as Indian incomes stagnated, while British incomes increased. (See figure 5) Industrial output per capita declined and agricultural output per capita increased slightly in the middle of the nineteenth century, but this was not sustained. The period 1870 to 1900 of rising agricultural exports coincided with 0.5 to 0.8 per cent per capita growth. From 1900, the economy stagnated. (See Table 1).

The extensive margin of cultivation increased in the nineteenth century. Land under cash crops, such as, cotton and sugarcane increased. For most crops, yield per acre was lower in 1910

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<sup>31</sup> Dasgupta, *A history of Indian economic thought*, ch 6

compared to 1600 (See Table 2) This does not tell us exactly when the decline began. Table 2 also shows the changes in yield per acre in different periods from 1891, when reliable agricultural statistics became available.<sup>32</sup> Yield per acre in food grains declined as did per capita food availability.

Roy sees this as an ecological crisis arising from market failure.<sup>33</sup> The introduction of the landlord system of taxation that was intended to incentivize landlords to carry out improvements in land, had failed to deliver. Areas under the landlord system, especially the rice growing belt in the east, saw a decline in land yield. Cultivators themselves in both landlord and non-landlord systems were too poor to make investments in land. Colonial India did not have institutions in place to provide access to credit to the cultivators, who were dependent on local money-lenders for any type of credit with high interest rates.<sup>34</sup> Therefore, building of wells under private initiative did not materialize.

Irrigation canals were the main source of water. The colonial state built one of the largest irrigations systems, but only 20 per cent of land under cultivation was irrigated in 1935. There were big differences in irrigation infrastructure across regions. The north west of the country has between 45- 80 per cent of land under canal irrigation. Canals and wells that covered 24 per cent of the cultivated land in the south and only 5 per cent in the east and the west. Yield per acre increased in regions with a high share of irrigated land.<sup>35</sup> The canals increased land under cultivation, but also increased output at the intensive margin by a shift to higher value crops.<sup>36</sup> Yield per acre for food crops, such as wheat on irrigated land, was higher across different regions and also comparable to European levels. Average yield on rice fields in India in 1900 was lower than in Japan and Indonesia. (See table 2B) The irrigated regions of north-western India, grew faster than other parts of the country.<sup>37</sup>

Canal irrigation required large investments. Capital formation during the colonial period was as low as 5-7 per cent of GDP.<sup>38</sup> In comparison to the railways, irrigation attracted very little

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<sup>32</sup> Blyn, *Agricultural trends*.

<sup>33</sup> Roy, 'A delayed revolution'

<sup>34</sup> Interest rates on loans to peasants could be as high as 30-50 per cent. (Roy, *The economic history*, p 135)

<sup>35</sup> Chaudhary et al, *A new economic history. Chapter 7*.

<sup>36</sup> Kurosaki, 'Specialization and diversification'

<sup>37</sup> Kurosaki, *Comparative economic development*

<sup>38</sup> This figure doubled soon from 1950 and was 3 times by 1980. (Gupta and Roy, 'From Artisanal Production to Machine Tools')

government spending. Expenditure on the railways from revenues was 20 percent and irrigation received less than 5 per cent. In the capital account, irrigation received less than 10 per cent of the expenditure on railways.<sup>39</sup> Returns on railway bonds were guaranteed at 5 per cent by the state and was considered safe investment in the capital market in Britain. To the he nationalists this cemented India's relationship with the Empire as a supplier of agricultural products and a market of British industrial goods. Sweeny argues that the colonial emphasis on railways was socially inefficient because of the relationship between irrigation and agriculture and overall economic development. Railways on the other hand were better for the strategic interests of the Raj.<sup>40</sup> Returns on public investment in irrigation were comparable to returns on railways.<sup>41</sup>

While lack on investment in agriculture had adverse consequences for growth, the contribution of the railways cannot be underestimated. By the end of the nineteenth century, India had a large railway network. The literature shows unequivocally that the railways integrated markets. Not only did price gaps across markets decline<sup>42</sup> the railways reduced the possibility of famines<sup>43</sup> and increased agricultural incomes in districts with access the railways.<sup>44</sup> There were large social saving too.<sup>45</sup> But the railways had little impact on agricultural productivity and the lack of investment in agricultural infrastructure had far more serious consequences for the economy in the early twentieth century than decline of traditional industries in the nineteenth century. Agricultural stagnation in colonial India was only reversed with new policies in independent India.

#### *Failure to industrialize?*

The decline of old industries was followed by the emergence of new ones. Industrial capacity developed using modern technology in several sectors. Tea and jute industries in eastern India were set up with British capital and a modern cotton textile industry developed in western India mainly with Indian capital. This sector imported machines from Britain and set up factories in the Bombay region. Indian trading groups from various communities, who had been involved in opium and cotton trade, now moved into industry. This industry though always in conflict with the cotton interests in Lancashire, had easy access to the British manufacturers of textile

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<sup>39</sup> Chaudhary et al, *A new economic history. Chapter 7.*

<sup>40</sup> Sweeny, *Financing India's Imperial Railways.*

<sup>41</sup> Chaudhary et al, *A new economic history. Chapter 7.*

<sup>42</sup> Hurd, J. 'Railways and the expansion of markets', Donaldson, 'Railroads of the Raj'

<sup>43</sup> Burgess and Donaldson, 'Can openness mitigate the effects of weather'

<sup>44</sup> Donaldson, 'Railroads of the Raj'

<sup>45</sup> Bogart & Chaudhary, 'Railways in Colonial India'

machinery. Despite the absence of protective tariffs the industry began to gain domestic market share from British imports. By early twentieth century, the modern cotton textile industry was the second largest industrial sector. The largest industrial processing sector was tea, which was entirely British owned and exported most of its output. The other modern industry in the nineteenth century was jute, which was also in the hands of British business and exported a large share of its output. British capital in industry was concentrated in the export sector and Indian capital dominated the main import substituting industry, cotton textiles.<sup>46</sup>

Though case studies of these individual industries paint a picture of growth and expansion<sup>47</sup> critics point to the absence of a machinery industry at the time of independence. The railways did not generate significant backward linkages to capital and intermediate goods industries as most equipment was imported from Britain.<sup>48</sup> Unlike in countries, such as Germany and the United States, where development of the railway network had a significant effect on industrial development, in India the railways did not play a similar role. The reliance on imports is only one part of the story. India also lacked both physical and human capital to have the capability to exploit backward linkages from the railways. The kind of ‘useful knowledge’ that had fostered the industrial revolution in Britain was missing. Workers with technical training were scarce. Most workers came from agriculture and were the first-generation industrial workers. For technical skills, industries such as cotton and jute textiles relied heavily on European technicians or members of the small community of Parsis, who had unusually high literacy and were in urban occupations.

Industry, in colonial India, was the fastest growing sector. (See table 3) It generated 12 per cent of GDP, but accounted for less than 10 per cent of employment. Most of this employment was in the small-scale sector using traditional technology. The history of survival, technological change and persistence of the small-scale sector has been well documented in the work of Tirthankar Roy and Douglas Haynes.<sup>49</sup> In 1900, large scale industries produced less than 20 per cent of industrial output. By 1947 both sectors had equal shares of industrial output. (See figure 6) The introduction of tariffs in the 1930s provided a boost to industrial investment in the large-scale sector. New industries developed such as paper and chemicals. The picture of

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<sup>46</sup> See Gupta, ‘Discrimination or Social Networks’ for a discussion.

<sup>47</sup> Morris, ‘Growth of Large-scale Industry to 1947.’ Gupta, and Roy, ‘From Artisanal Production to Machine Tools’

<sup>48</sup> Parthasarathi, *Why Europe grew rich*, p. 256.

<sup>49</sup> Roy, *Traditional Industry*, Haynes, *Small Town Capitalism*.

the industrial economy in colonial India is one of some dynamism rather than failure. The drag on economic growth came from agriculture. Despite the failure to develop a machinery industry, India did not look that different from a comparable Asian country, such as Korea in 1940. (See discussion in section 10)

### *Human Capital*

At the time of independence, only 17 per cent of Indian population was literate. The colonial period had seen a rise in school enrollment, but it was still one of the lowest in the world. Public investment in education was also one of the lowest in the world. It was lower than in other British colonies and other non-industrial economies, such as Brazil and Mexico, and lower than the princely states in India that were outside colonial governance.<sup>50</sup> In 1931<sup>51</sup>, 142 out of 1000 school age children were at school. (See table 4) Compulsory primary schooling did not become a national policy at a time when it was being adopted in Britain. It was not unusual for British laws to be adopted in India. Many of the labour legislations involving hours of work and working hours for women and children as well as Masters and Servants laws were transplanted from Britain to India. But on primary education, the colonial government did very little.

India followed a different path in developing human capital from the rest of the world. Although the overall public expenditure on education was low, expenditure on secondary education was disproportionately high. Secondary school enrollment was high relative to primary school enrollment and comparable to countries in Europe. Nearly 60 per cent of the education budget was assigned to secondary education in 1930, while in Japan it was less than one-third.<sup>52</sup> In the middle of the nineteenth century universities were set up in the large metropolitan cities: Calcutta, Bombay, Madras and Delhi. The colonial government aimed to create an English-speaking elite, who could run the administration. Education spending reflected this elite bias of colonial education policy. This had implications for development that lasted beyond the colonial period.

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<sup>50</sup> Chaudhary and Garg, 'Does history matter?'

<sup>51</sup> The figures from 1931 are reported as the census of 1941 is not reliable.

<sup>52</sup> Van Leeuwen, *Human capital and economic growth*, pp 276-284.

To summarize, GDP growth in colonial India did not keep pace with population growth. Table 3 shows agriculture stagnated. Large scale modern industry grew faster than any other sector from a small base. The industrial workers did not benefit greatly from the expansion of education, but many service sector workers did.

## II *Catching up*

The transition from a colonial Economy began with the policy of industrialization under the new government of Jawaharlal Nehru, the first prime minister of independent India. A *dirigiste* state adopted Five Year Plans to transform a dependent colonial economy to a self-sufficient one. The focus of this transition was to build a large industrial sector not by protecting the infant industries, but building a capital goods sector with the state as an entrepreneur. The developmental state sought to break with the international specialization of colonial economy. Policymakers in Latin America influenced by Raul Prebisch's writings<sup>53</sup>, moved towards import substituting industrialization. Newly independent countries in East Asia, such as South Korea and Taiwan, initially followed policies of industrialization through regulation of international trade. The African colonies gaining independence a decade later would follow a similar path too. Import substituting industrialization was the policy choice of post-colonial economies in the 1950s and 1960s. In the short-term it raised the rate of growth in many countries. The medium and long term effects depended on policies towards reintegration back to a global economy. While East Asian countries moved quickly towards this, the Indian economy remained protectionist with adverse consequences for growth.

Studies of the Indian economy under planning see it as a failure in comparison to the East Asian successes. Catching up was slow and the low growth rate between 1950-80, came to be known as the *Hindu equilibrium*. The economy was overburdened with regulation and efficiencies pulled down productivity growth.<sup>54</sup> For the economic historian 1950 was a turning point in *falling behind*. The decline in output per worker relative to the UK shows a reversal after independence. (See figure 7) If the first half of the twentieth century had seen stagnation, there was sustained growth from 1950.

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<sup>53</sup> Prebisch, 'Economic development of Latin America'.

<sup>54</sup> Ahluwalia, *Industrial Growth in India: Stagnation since the mid-sixties*, Bhagwati and Desai, *India; planning for industrialization*.

### *Rise and Fall of Regulation*

Five year plans were drawn up to change the structure of the colonial economy. The first plan focused on building infrastructure. In 1954, at the opening of one of the largest dams in India, Nehru outlined his vision of dams as “temples of modern India.” The Second Plan 1956-61 adopted a Soviet style development model of industrialization. The Mahalanobis Plan, as it was named after its architect, put capital goods at the centre of an industrialization strategy. In the Mahalanobis framework, there were two sectors in an economy: capital and consumer goods. An increase in production of capital and intermediate goods would raise the investment rate. However, this entailed a *coordination problem* between private entrepreneurs not certain about the future rates of return. The emerging capitalist class in 1950 was represented by the social networks of trading communities that had ventured into industry. Many sections of the business interests had supported the Congress in the struggle for independence and in the drawing up of the Bombay Plan of 1944 that sketched the picture of economic development at the end of colonial rule. The private sector was not hostile to government involvement.<sup>55</sup>

The objectives of the second plan were achieved through regulating trade and industrial investment through quantitative controls. Quotas rather than tariffs were the basis trade policy. Industrial investment required private entrepreneurs to apply for licenses to enter any particular industry. Several industries of strategic interest as well as capital and intermediate goods remained out of bounds for the private sector. State enterprises dominated many industries. The myriad of regulations around industry and trade came to be known as the *License Raj*.

The strategy paid off initially as industry grew at 7 per cent per year between 1950 and 1964. (See table 3) The slow down began thereafter. The first plan had invested in agricultural infrastructure and a few large-scale irrigation projects, the share of agriculture in public investment was still 12 per cent in the early 1960s.<sup>56</sup> Agricultural growth turned positive from 1950, although its fortunes still relied on the Monsoon rains. It was the technological change in agriculture, known as the *green revolution*, that raised agricultural productivity. The change came from adoption of high yielding varieties of seeds, first in wheat and then in rice. The new seeds required intensive use of water and fertilizers. Public investment in agriculture tripled

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<sup>55</sup> Rothermund, *An economic history of India*, Tomlinson, *The Political Economy of the Raj*.

Chibber 2003 has a different view and argues that the Indian business interests were opposed to the level of state intervention that underlined the Bombay Plan.

<sup>56</sup> Balakrishnan, *Economic growth in India*, p117.

between 1960 and 1980.<sup>57</sup> Yield per acre doubled in rice production by 1990, tripled in wheat production. The rate of growth of output per worker in agriculture though higher than in the colonial period, was lower than in that of industry and services. The policies of state directed development, had pulled India out of stagnation of the colonial economy, but could not move the economy to a high growth regime. Indian growth in the first thirty years after independence, was less than 2 per cent a year, when comparable economies in East Asia were growing at 5-6 per cent per year.

This was to change following dismantling of the regulatory system. The first policy change was a gradual removal of industrial licensing in the 1980s. and replacement of quantitative controls in trade with price based controls, such as, tariffs and subsidies. Both policies opened up opportunities for the private sector. Rodrik and Subramanian distinguish the “pro-business” reforms of the 1980s from the “pro-market” reforms after the devaluation of the Indian rupee in 1991.<sup>58</sup> Pro-business reforms opened up most sectors for private investment. The attitudinal shift of the policy makers in the 1980s towards the private sector saw a big increase in output per worker in manufacturing.<sup>59</sup> and total factor productivity growth.<sup>60</sup> The “pro market” reforms of the 1990s lowered price based controls, and removed restrictions on international capital flows. The economy moved to a high growth regime following the reforms.<sup>61</sup>

Per capita GDP growth doubled from 1980 and rose above 4 percent per year after 1990 (See table 1) Estimates of structural break in GDP from 1950 to 2000, find a break point around 1979 to the early 1980s.<sup>62</sup> It shows Indian growth from 1950 during the years of planning as a failure and the pro-business rather than the pro market reforms as the turning point. A long run perspective over the twentieth century, finds a structural break in GDP growth in the early 1950s.<sup>63</sup>

Delong sees India’s performance under planning as average rather than a disaster. Output per

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<sup>57</sup>Balakrishnan, *Economic Growth in India* pp117- 118

<sup>58</sup> Rodrik, and Subramanian, ‘From Hindu Growth to Productivity Surge’

<sup>59</sup> Rodrik and Subramanian, ‘From Hindu Growth to Productivity Surge’, Delong, B. (2003). ‘India since Independence’

<sup>60</sup> Bosworth et al., *Sources of growth*

<sup>61</sup> This article has focused on growth. Inequality and poverty, which are the focus of a large number of papers have not been part of this discussion.

<sup>62</sup> Rodrik and Subramanian, ‘From Hindu Growth to Productivity Surge’, Balakrishnan, and Parameswaran, ‘Understanding Economic Growth’, Wallack, ‘Structural Breaks in Indian Macroeconomic Data’

<sup>63</sup> Hatakhar and Dongre, ‘Structural breaks in India's growth’

worker and the share of investment in GDP was comparable to the average developing country during 1960-1992. DeLong argues that despite the loss of efficiency the increase in resource mobilization had a positive effect.<sup>64</sup> Gross domestic capital formation rose 6-7 per cent of GDP before 1940 to 13 per cent in 1951, rising to 20 per cent in the 1970s.<sup>65</sup> The Nehruvian regime was a response to the inadequacies of the colonial period. The transition from the stagnation of a colonial economy coincided with regulation of economic activity after independence. As figure 7 shows, the decline in Indian output per worker relative to the UK reversed from 1950/51. India's growth failure after independence is with reference to the East Asian miracle. The discussion in the following sections suggest that colonial legacy had long run effects and differences in colonial legacies led to different outcomes in South and East Asia.

#### *Long run Effects of colonial policies*

Colonization left a deep imprint on the development of the post-colonial decades. The literature discusses three different persistent effects of colonial rule:

**Land tenure institutions:** There were enduring effects of the colonial land tenure system. In 1980, there were systematic differences in agricultural productivity between landlord and non-landlord regions.<sup>66</sup> The latter did better in terms of yield per acre. Provision of public goods was also higher in non-landlord regions.<sup>67</sup> The different economic outcomes in the provinces of Bombay presidency (Maharashtra and Gujarat today) and Bengal (West Bengal today) are examples of the differences outlined above.

**Human Capital:** The impact of colonial policies for education has been most visible through regional variation in primary schooling and the relative importance of higher education. The effect of education spending in 1911 persisted until 1971.<sup>68</sup> The high share of secondary and tertiary education in education spending also remained a feature of the education system with implications for human capital of the workforce. In 2000, public expenditure per pupil as a percentage of GDP per capita was 14 for primary education, 23 for secondary and 86 for tertiary.<sup>69</sup>

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<sup>64</sup> DeLong, 'India since Independence'

<sup>65</sup> Gupta and Roy, 'From Artisanal Production to Machine Tools, table 10.2

<sup>66</sup> Banerjee and Iyer, 'History, Institutions'

<sup>67</sup> Banerjee et al, 'History, social divisions, and public goods'

<sup>68</sup> Chaudhary and Garg, 'Does history matter?'

<sup>69</sup> Balakrishnan, *Economic Growth in India* p214, based on UNESCO Global Education Digest.

The relative advantage of the Service sector: The path of Indian economic growth has not followed the familiar pattern of structural change seen in mature industrial economies, where the share of industry in GDP and employment increased as the share of agriculture declined. The share of agriculture in employment declined slowly from 75 per cent in 1900 to 64 per cent in 2000.<sup>70</sup> The secondary sector in India did not emerge as the largest sector at any time both in terms of output and employment over the twentieth century. This pattern is not so unusual in the late industrializing countries. India is unusual in the leading role of services in growth since 1980. Bosworth and Collins show that total factor productivity growth has been high in services from 1978 to 2004 and higher than in China.<sup>71</sup> In the 1980s the fastest growing sectors in industry did not create many unskilled jobs. The expansion of sectors, such as, trade and construction in the 1990s absorbed more unskilled workers.<sup>72</sup> India stands out as an early example of a service- sector led growth.

The historical legacy of a high share of secondary and tertiary education relative to primary education may explain the high productivity in the service sector. The 2001 census shows a concentration of workers with secondary and tertiary education in services. Most workers without basic literacy were in agriculture. Surprisingly a large proportion of industrial workers also lacked primary education. The emphasis on tertiary education in the early decades of planning, gave skill intensive sectors an advantage.<sup>73</sup> Such an emphasis on tertiary and secondary education had colonial origins.

The census of 1901 does not provide a breakdown of literacy by sectors. Broadberry and Gupta have used the literacy levels in occupation based caste groups in the census of 1901 as a proxy of human capital across sectors. The trading castes had high literacy across regions indicating a concentration of human capital in the service sector and may explain the relative advantage this sector started with.<sup>74</sup> The pattern of education spending benefitted upper castes in service sector occupations. The service sector advantage was further reinforced by policies in independent India. Labour productivity of the service sector relative to the UK rose from 16 per cent in 1900 to 33 per cent in 2000 while relative labour productivity in industry has declined. (See figure 7) The shortage of human capital in industry may also account for the

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<sup>70</sup> Sivasubramonian, *The National Income of India*, tables 2.8 and 9.31

<sup>71</sup> Bosworth and Collins, 'Accounting for Growth'

<sup>72</sup> Kotwal et al, 'Economic liberalization'

<sup>73</sup> Kochhar et al, 'India's pattern of development'

<sup>74</sup> Broadberry and Gupta, 'The historical roots'

relative disadvantage in manufacturing compared to other Asian countries. Indian literacy rate was lower than in comparable Asian countries, South Korea, Taiwan and Malaysia in 1960 and has remained low over time.<sup>75</sup>

### ***III Falling Behind: Comparison with East Asia***

South Korea and Taiwan emerged from Japanese colonization also in the middle of the twentieth century and moved to a high growth regime. Figure 8 shows Indian GDP per capita in comparison with other non-industrial countries in 1950. South Korea and Taiwan did not look significantly different from India in 1910. Independent countries in Latin America were better off than the colonies in 1950. In the second half of the twentieth century, the East Asian Economies have forged ahead and overtaken comparable countries not only in Asia, but also in Latin America.

Did East Asia have different initial conditions in 1950? Taiwan became a Japanese colony in 1895 and Korea in 1905. Both countries saw positive growth in agriculture during the colonial period and an extension of primary education. Neither was different from India in terms of industrial capacity. Kohli argues that the developmental state of the post war period had origins in the Japanese colonial state.<sup>76</sup> Korea's transition from a corrupt and ineffective state to a developmental state was designed on the Japanese state after Meiji Restoration of 1868.<sup>77</sup>

Was Japan different as a colonizer? The nationalist historians have argued, as in the case of India, that links with Japan destroyed local industry and Korean development aided the interests of the Japanese economy.<sup>78</sup> Cha takes a different view and shows that the ecological crisis in Korea in the nineteenth century, was reversed by technological change in agriculture under the Rice Production Development Programme of the colonial regime.<sup>79</sup> Rice production grew at 3.8 per cent per year in the colonial period.<sup>80</sup> Agricultural productivity increased in colonial Korea and Taiwan with the availability of Japanese varieties of rice and the building of a rural infrastructure for rice cultivation often with private initiative. Over 80 per cent of land under cultivation was irrigated in Taiwan and 68 per cent in Korea by 1939.<sup>81</sup>

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<sup>75</sup> Bosworth et al., 'Sources of growth'

<sup>76</sup> Kohli, *State Directed Development*

<sup>77</sup> Kohli, 'Where do high growth political economies come from'

<sup>78</sup> The literature is summarized in Cha, 'Facts and myths about Korea's economic past'

<sup>79</sup> Cha, 'Facts and myths about Korea's economic past'

<sup>80</sup> Kim and Park, 'Colonialism and industrialization'

<sup>81</sup> Booth, 'Colonial legacies'

New estimates of Korean per capita GDP show the colonial economy growing at 2 per cent per year between 1911 and 1940.<sup>82</sup> The share of agriculture in GDP declined in colonial Korea, and the share of manufacturing industry increased. Japan set up new industries in Korea in the 1930s. Most of Korea's industrial growth before 1930 can be attributed to rising total factor productivity in the small local firms.<sup>83</sup> The share of industrial output at the time of independence was not very different from that in India. Where East Asia and India differed was not in industry, but mainly the developments in agriculture and investment in human capital.

Neither Korea nor Taiwan attained universal primary education under colonial rule, but education policy targeted primary school enrollment. By 1940 Taiwan's enrollment rate was over 50 per cent and Korea's over 30 per cent. A comparative perspective does point to policy failures in agriculture and education in the largest colonial economy in Asia. These differences put India at a disadvantage.

A discussion of comparative economic performance of India and East Asia will be incomplete without a reference to the different policies adopted after decolonization. Korea and Taiwan adopted policies toward import substitution in the 1950s using multiple exchange rates and tariffs. However, from the early 1960s, both countries adopted policies to increase exports targeting specific sectors by subsidized credit and easy access to foreign exchange. They followed an infant industry policy of protecting a domestic industry only in the "learning" phase.<sup>84</sup> Industries such as petro chemicals, shipbuilding and automobiles in South Korea and electronics in Taiwan gained competitive advantage in the international market as a result of the regulatory role of the state. Where India failed under the heavy hand of regulation and protection of the home market, the East Asian states built a competitive manufacturing industry.

Collins et al argue that external conditions explain very little of the growth difference between South and East Asia. Education is a more important explanatory variable. In South Korea and Taiwan, the average years of education of the workforce rose from 3.2 in 1960 to over 8 in

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<sup>82</sup> Cha and Kim, 'Korea's first industrial revolution'

<sup>83</sup> Kim and Park, 'Colonialism and industrialization'

<sup>84</sup> Perkins and Tang, 'East Asian Industrial Pioneers'

1994. In India, the change was from 1.3 to 3.4.<sup>85</sup> Public expenditure on education in South Korea was twice as high as in India in 1970.<sup>86</sup> The importance of initial conditions in education and low inequality in the two East Asian economies has also been emphasized by Rodrik (1997) The long run consequences of colonial policy may have contributed to the different paths of development in South and East Asia.

#### ***IV Conclusion***

This article has argued that India fell behind during colonial rule. The decline in Indian GDP per capita coincided with the rising textile trade with Europe. The decline continued under the rule of the East India company and stagnated during the rule of the British crown and widened the divergence between India and Britain. The decline of traditional industries was not the main driver Indian decline. The failure of the colonial government to raise agricultural productivity led to the stagnation. Modern industries emerged and grew relatively fast.

The falling behind of the Indian economy was reversed in independent India. Policies of industrialization and a green revolution in agriculture increased productivity growth in both sectors. However, the most successful sector in Indian growth dynamics is the service sector. This sector has the largest share of GDP, the largest share of literate and skilled workers and has been the fastest growing sector in recent times. India is one of the first examples of a service sector led growth. Indian advantage in the services has historical origins.

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<sup>85</sup> Collins et al, 'Economic growth in East Asia'

<sup>86</sup> Balakrishnan, *Economic Growth in India*, p 213

## **References:**

- Allen, R.C., Bassino, J.P., Ma, D., Moll-Murata, C. and Van Zanden, J.L., 'Wages, prices, and living standards in China, 1738–1925: in comparison with Europe, Japan, and India', *The Economic History Review*, 64 (2011), pp. 8-38.
- Ahluwalia, I.J., *Industrial Growth in India: Stagnation since the mid-sixties*, (Oxford University Press, USA, 1985).
- Amin, S., *Unequal Development: An Essay on the Social Formations of Peripheral Capitalism*, (Hassocks: Harvester, 1976).
- Bagchi, A.K., *Private Investment in India*, Cambridge: Cambridge University Press, (1972).
- Bagchi, A. K., 'Deindustrialization in India in the nineteenth century: Some theoretical implications', *Journal of Development Studies*, 22 (1976), pp. 135–64.
- Bagchi, A.K., *The Political Economy of Underdevelopment*, (Cambridge University Press, 1982).
- Banerjee, A., and Iyer., L. 'History, institutions, and economic performance: The legacy of colonial land tenure systems in India', *American Economic Review*, 95 (2005), pp. 1190–213.
- Banerjee, A., Iyer, L., and Somanathan, R., 'History, social divisions, and public goods in rural India'. *Journal of the European Economic Association*, 3 (2005), pp. 639-647.
- Balakrishnan, P., *Economic Growth in India*, (Delhi: Oxford University Press, 2010).
- Balakrishnan, P., and Parameswaran, M., 'Understanding economic growth in India: A Prerequisite.' *Economic and Political Weekly*, 42 (2007), pp. 2915–22.
- Bayly, C.A., *Rulers, Townsmen and Bazaars: North Indian Society in the Age of British Expansion, 1770-1870*, (Cambridge: Cambridge University Press, 1983).
- Berg, M., 'In pursuit of luxury: global history and British consumer goods in the eighteenth century'. *Past & present*, 182 (2004), pp. 85-142.
- Bhagwati, J.N. and Desai, P., *India; planning for industrialization; industrialization and trade policies since 1951*, (Delhi: Oxford University Press, 1970).
- Blyn, G., *Agricultural Trends in India, 1891–1947: Output, Availability, and Productivity*, (Philadelphia: University of Pennsylvania Press, 1966).
- Bogart, D., and Chaudhary, L., 'Railways in Colonial India' in Chaudhary, L., Gupta, B., Roy, T. and Swamy, A.V., eds., *A new economic history of colonial India*. (London: Routledge, 2015).
- Booth, A., *Colonial legacies: Economic and social development in East and Southeast Asia*. (University of Hawaii Press, 2007).
- Bosworth, B. and Collins, S., 'Accounting for growth: Comparing China and India', *Journal of Economic Perspectives*, 22 (2008), pp. 45-66.
- Bosworth, B., Collins, S.M. and Virmani, A., 'Sources of growth in the Indian economy' (No. w12901). National Bureau of Economic Research, (2007) .

Broadberry, S. N. and Gupta, B., 'The early modern great divergence: wages, prices and economic development in Europe and Asia, 1500–1800', *Economic History Review*, 59 (2006), pp. 2–31.

Broadberry, S.N and Gupta, B., 'Lancashire, India, and shifting competitive advantage in cotton textiles, 1700–1850: the neglected role of factor prices'. *The Economic History Review*, 62 (2009), pp. 279-305.

Broadberry, S.N and Gupta, B., 'The Historical Roots of India's Service-Led development: A Sectoral Analysis of Anglo-Indian Productivity Differences, 1870-2000', *Explorations in Economic History*, 47 (2010), pp. 264-278.

Broadberry, S., Custodis, J. and Gupta, B., 'India and the great divergence: An Anglo-Indian comparison of GDP per capita, 1600–1871' *Explorations in Economic History*, 55 (2015), pp. 58-75.

Burgess, R., and Donaldson, D., (2010). 'Can openness mitigate the effects of weather shocks? Evidence from India's famine era'. *The American Economic Review*, 100(2): 449-453.

Cha, M. S., and Kim, N. N., 'Korea's first industrial revolution, 1911-1940'. *Explorations in Economic History*, 49 (2012), pp. 60-74.

Cha, M. S., 'Facts and myths about Korea's economic past'. *Australian Economic History Review*, 44 (2004), pp. 278-293.

Chaudhuri, K.N., *The Trading World of Asia and the English East India Company, 1660–1760*, (Cambridge: Cambridge University Press, 1978).

Chaudhuri, K.N., 'Foreign trade and balance of payments (1757–1947)'. In: Kumar, D., Desai, M. (Eds.), *The Cambridge Economic History of India.*, vol. 2. Cambridge University Press, Cambridge, (1983), pp. 804–877.

Chaudhary, L. and M. Garg, M., 'Does history matter? Colonial education investments in India', *The Economic History Review*, 68 (2015), pp. 937-961.

Chaudhary, L., Gupta, B., Roy, T. and Swamy, A.V., eds., *A New Economic History of Colonial India*. (London: Routledge, 2015).

Chaudhury, S., *From Prosperity to decline: Eighteenth Century Bengal*, (Delhi: Manohar, 1995).

Clingingsmith, D. and Williamson, J.G., 'Deindustrialization in 18th and 19th century India: Mughal decline, climate shocks and British industrial ascent'. *Explorations in Economic History*, 45 (2008), pp. 209-234.

Collins, S.M., Bosworth, B.P. and Rodrik, D., 'Economic growth in East Asia: Accumulation versus assimilation' *Brookings papers on economic activity*, (1996), pp. 135-203.

Dasgupta, A. K., *A history of Indian economic thought*. (Routledge, 2002).

DeLong, B., 'India since Independence: An Analytical Growth Narrative' in Rodrik, D (ed) *In Search of Prosperity: Analytical Narratives on Economic Growth*, (Princeton University Press, Princeton, 2003).

Desai, A.V., Population and standards of living in Akbar's time. *Indian Economic and Social History Review*, 9 (1972), pp. 43–62.

Donaldson, D., 'Railroads of the Raj: Estimating the impact of transportation infrastructure', *American Economic Review*, 108 (2018), pp. 899-934.

Dutt, R.C., *The Economic History of India: In the Victorian Age*, (London: Kegan Paul, 1908)

Ferguson, N., *Empire: How Britain made the modern world*. (Penguin UK. 2012).

Frank, A.G., *The Development of Underdevelopment*, (Monthly Review Press, 1966)

Frankel, J.A. and Romer, D.H., 'Does trade cause growth?' *American Economic Review*, 89 (1999), pp. 379-399.

Go Sun and Park, Ki-Joo., 'The elite-biased growth of elementary schooling in colonial Korea', Working Paper, (2017).

Gupta, B., "Discrimination or social Networks: Industrial investment in colonial India", *Journal of Economic History*, 74 (2014), pp. 141-168.

Gupta, B. and T. Roy 'From Artisanal Production to Machine Tools: Industrialization in India over the Long Run' in O'Rourke K. H. and Williamson, J. G. (eds.), *The Spread of Modern Industry to the Periphery since 1871*, (Oxford: Oxford University Press, 2017)

Habib, I., "Notes on Indian textile technology in the seventeenth century", in B. De, ed., *Essays in honour of Professor S. C. Sarkar* (New Delhi 1976)

Hatekar, N., and Dongre, A., 'Structural breaks in India's growth: revisiting the debate with a longer perspective'. *Economic and Political Weekly*, (2005), pp. 1432-1435.

Haynes, D. E., *Small Town Capitalism in Western India: Artisans, Merchants and the Making of the Informal Economy, 1870-1960* (Vol. 20). (Cambridge: Cambridge University Press, 2012).

Heston, A., 'National Income', in Kumar, D. and Desai, M. (eds.). *The Cambridge Economic History of India, Volume 2: c.1757-c.1970*, Cambridge: Cambridge University Press, (1983), pp. 463-532.

Hurd, J., 'Railways and the expansion of markets in India, 1861–1921'. *Explorations in Economic History*, 12 (1975), 263-288.

Kim, D., and K. J. Park, 'Colonialism and industrialization: factory labour productivity of colonial Korea, 1913–37'. *Australian Economic History Review*, 48 (2008), pp. 26-46.

Kochhar, K., Kumar, U., Rajan, R., Subramanian, A., and Tokatlidis, I. 'India's pattern of development: What happened, what follows?' *Journal of Monetary Economics*, 53 (2006), pp. 981-1019.

Kohli, A., 'Where do high growth political economies come from? The Japanese lineage of Korea's "developmental state"'. *World Development*, 22 (1994), pp. 1269-1293.

Kohli, A., *State Directed Development*, (Cambridge: Cambridge University Press, 2004)

Kotwal, A., Ramaswami, B., and Wadhwa, W., 'Economic liberalization and Indian economic growth: What's the evidence?' *Journal of Economic Literature*, 49 (2011), 1152-1199.

Kurosaki, T., 'Specialization and diversification in agricultural transformation: the case of West Punjab', 1903–92. *American Journal of Agricultural Economics*, 85 (2003), pp. 372-386.

Kurosaki, T., *Comparative economic development in India, Pakistan and Bangladesh: agriculture in the 20th century*. Economic Research Series Hitosubashi University N. 45, (Tokyo: Maruzen Publishing Company, (2017).

Lemire, B., and Riello., G. (2008). 'East and west: Textiles and fashion in early modern Europe'. *Journal of Social History*, 41(4), 887-916.

Maddison, A., *Monitoring the World Economy, 1820-1992*, Paris: Organisation for Economic Co-operation and Development, (1995).

Moosvi, S., *The Economy of the Mughal Empire c. 1595: A Statistical Study*, (Delhi: Oxford University Press, 1987).

Morris, M.D., "Growth of Large-scale Industry to 1947." In Dharma Kumar, ed., *The Cambridge Economic History of India*, vol. 2, (Cambridge: Cambridge University Press, 1983), pp. 553-676

Pascali, L., 'The wind of change: Maritime technology, trade, and economic development' *American Economic Review*, 107 (2017), pp. 2821-54.

Parthasarathi, P., *Why Europe grew rich and Asia did not: Global economic divergence, 1600–1850*, (Cambridge University Press, 2011).

Perkins D.H and J.P., in 'East Asian Industrial Pioneers: Japan, Korea and Taiwan' in O'Rourke K. H. and Williamson J. G. (eds.), *The Spread of Modern Industry to the Periphery since 1871*, (Oxford University Press, 2017)

Prakash, O., *The Dutch East India Company and the Economy of Bengal, 1630-1720*. (Princeton University Press, 2014).

Prakash, O., 'Bullion for Goods: International Trade and the Economy of Early Eighteenth Century Bengal'. *The Indian Economic & Social History Review*, 13 (1976), pp. 159-186.

Prebisch, R., 'The economic development of Latin America and its principal problems'. *Economic Bulletin for Latin America* 7 (1950), pp. 1-12.

Ray, I., 'Identifying the woes of the cotton textile industry in Bengal: tales of the nineteenth century', *The Economic History Review*, 62 (2009), pp. 857-892.

Ray, I., *Bengal Industries and the British Industrial Revolution (1757-1857)*. (Routledge, 2011).

Raychaudhuri, T., and Habib, I. (ed) *The Cambridge Economic History of India, Vol. I: c. 1200–1750*, (Cambridge, Cambridge University Press, 1982).

Rodrik, D. and Subramanian, A., 'From Hindu Growth to Productivity Surge: The Mystery of the Indian Growth Transition', *IMF Staff Papers*, 52 (2005), pp. 193-228

Rodrik, D., 'Getting interventions right: how South Korea and Taiwan grew rich.' *Economic policy* 10 (1995), pp. 53-107.

Rothermund, D. *An Economic History of India*, (Routledge, 2002).

Roy, B., *An Analysis of Long Term Growth of National Income and Capital Formation in India (1850-51 to 1950-51)*. (Calcutta: Firma KLM Private, 1996).

Roy, T., *Traditional Industry in the Economy of Colonial India*, (Cambridge: Cambridge University Press, 1999).

Roy, T. Economic history and modern India: redefining the link. *The Journal of Economic Perspectives*, 16 (2002), pp. 109-130.

Roy, T. 'A delayed revolution: environment and agrarian change in India'. *Oxford Review of Economic Policy*, 23 (2007), pp. 239-250.

Roy, T., *The Economic History of India 1857-1947*, Third Edition, (Delhi: Oxford University Press, 2011).

Sivasubramonian, S., *The National Income of India in the Twentieth Century*, (Oxford University Press, New Delhi, 2000)

Sweeney, S., *Financing India's Imperial Railways, 1875–1914.*, (London: Pickering and Chatto, 2011).

Tomlinson, B. R., *The Political Economy of the Raj 1914–1947: The Economics of Decolonization in India*, (London, Palgrave Macmillan, 1979)

Twomey, M.J., (1983). 'Employment in nineteenth century Indian textiles'. *Explorations in Economic History* 20, 37–57.

Van Leeuwen, B., *Human Capital and Economic Growth in India, Indonesia, and Japan: A Quantitative Analysis, 1890-2000*, (Box Press shop, 2007).

Wallack, J., 'Structural Breaks in Indian Macroeconomic Data.' *Economic and Political Weekly*, 38 (2003), pp. 4312–15.

Wallerstein, I. *The modern world-system: Capitalist agriculture and the origins of the European world-economy in the sixteenth century*. (Academic Press 1974).

Table 1: *Changes in Annual Growth Rate in per capita GDP (%)*

	GDP per capita
1870-1885*	0.5
1885-1900*	0.8
1900-1947	0.1
1950-1980	1.4
1980-1990	3.0
1990-2000	4.1
<b>1950-2000</b>	<b>1.9</b>

Source: \* Heston (1982) table 4.5. Sivasubramonian (2000) table 6.11.

Table 2A: *Changes in Yield per Acre by Crop*

Yield in lbs./acre Ratio 1910/1600 <sup>1</sup>		Growth in Yield per Acre per year 1891-1946 <sup>2</sup>			
			1891-1916	1916-21	1921-46
<b>Wheat</b>	0.75				
<b>Rice</b>	0.69	All Crops	0.47	-0.36	-0.02
<b>Sugarcane</b>	2.21				
<b>Cotton</b>	0.24	All Food	0.29	-0.63	-0.44
<b>Average Yield</b>	0.91				
<b>Acreage</b>	1.89	All Non-Food	0.81	0.34	1.16
<b>Output</b>	1.57				

Source: <sup>1</sup> Desai 1972, <sup>2</sup> Roy 2012, table 4.2

Table 2B: *Variations in Land Productivity in Comparative Perspective*

	Wheat Yield in India 1911 (lbs per acre)		Wheat Yield in Europe 1910 (lbs per acre)	
	Irrigated	Unirrigated	Europe	
United Provinces	1250	850	UK	1909
Punjab	898	555	Germany	1651
NWFP	874	559	France	1178
Bombay	1340	510	Italy	856
Sind	1340		Portugal	835
Rice Yield in 1900 (lbs per acre)				
India	Japan	Indonesia		
944	1702	1076		

Note: NWFP North-West Frontier Province

Source: Wheat: Agricultural Statistics of British India 1911

Europe: Bairoch (1997), 'New estimates on agricultural productivity and yields of developed countries 1800-1990', table 2.2, in: A. Bhadrui & R. Skarstein (eds.), *Economic Development and Agricultural Productivity*, Lyme, NH: Ed

Rice: Roy (2007)

Table 3: *Sectoral Growth (% per year)*

	Primary	Secondary	Tertiary
1910-1940	0.0	2.3	2.2
1950-1964	3.0	6.8	3.8
1965-1985	2.5	4.3	4.4
1986-2007	3.4	6.8	7.1

Source: Roy 2012, table 12.1

Table 4: *Comparative Enrollment Rates (Number enrolled per 1000 school age population)*

	India	Brazil	Japan	France	UK
<b>Primary</b>					
1900	53	102	507	859	720
1910	78	123	599	857	729
1920	102	147	602	704	701
1930	142	215	609	803	745
<b>Secondary</b>					
1900	10	0	13	11	7
1910	14	5	74	14	21
1920	20	6	108	24	44
1930	34	8	165	32	58

Source: Chaudhary 2015, chapter 10

Table 5: *Changes in Sectoral Shares in India and Korea (1910-2000)*

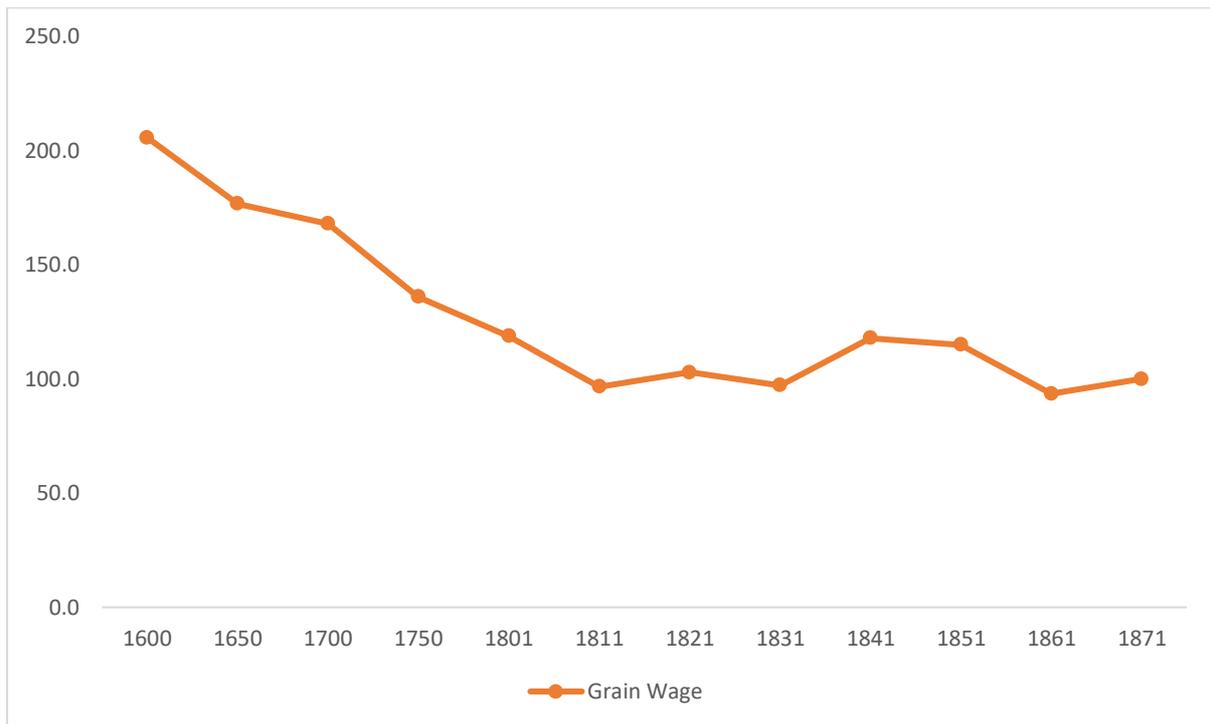
	Primary		Manufacturing*		Tertiary	
	India	Korea	India	Korea	India	Korea
1910	64.5	67.8	11.4	4.4	23.5	25.5
1940	53.7	42.0	13.6	13.7	32.0	32.0
1960	46.8	39.6	14.5	12.1	30.2	41.4
1980	33.2	16.0	19.9	24.6	38.2	48.0
2000	22.6	4.6	23.4	28.3	45.5	57.3

Source: Sivasubramonian (2000) for India Kim, Nak Nyeon ed., National Accounts of Korea 1911-2010 (Seoul: SNU Press, 2012)

Note- 1910-1940 includes the combined regions of North and South Korea

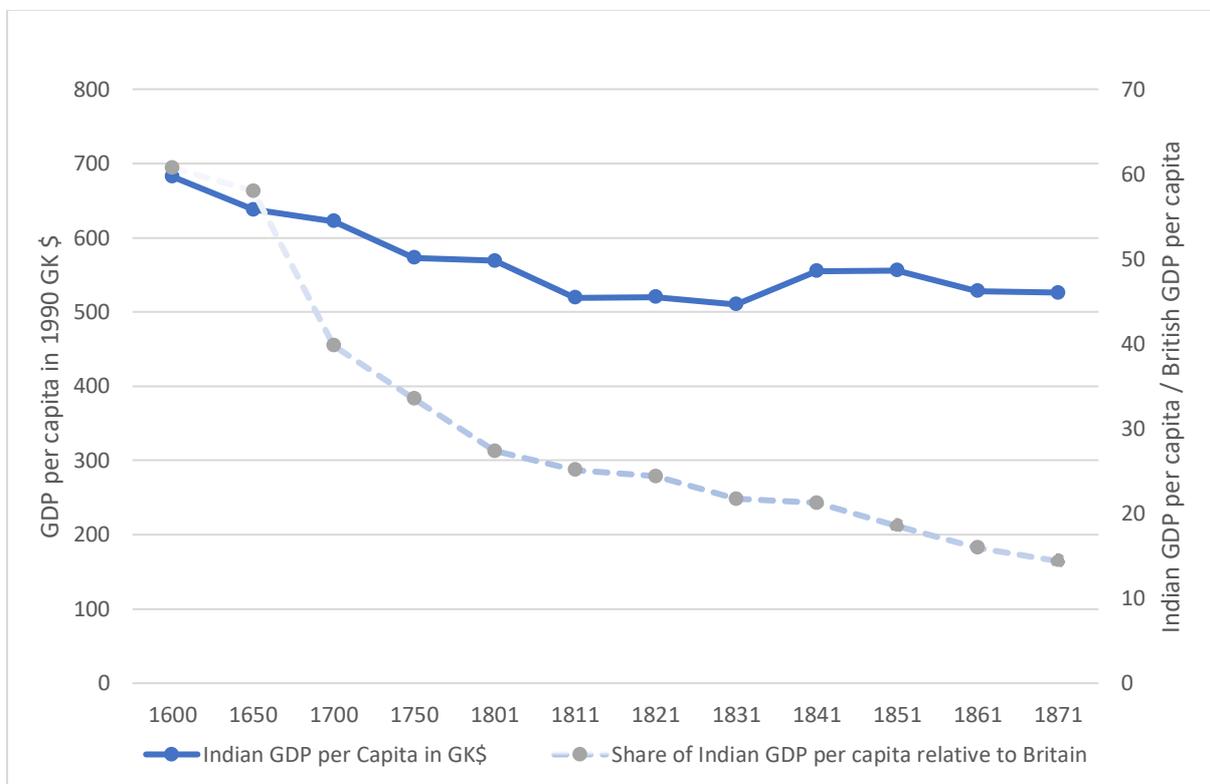
\*Share of sectors other than manufacturing within the secondary sector are not reported

Figure 1: *Indian Grain Wage (1870=100)*



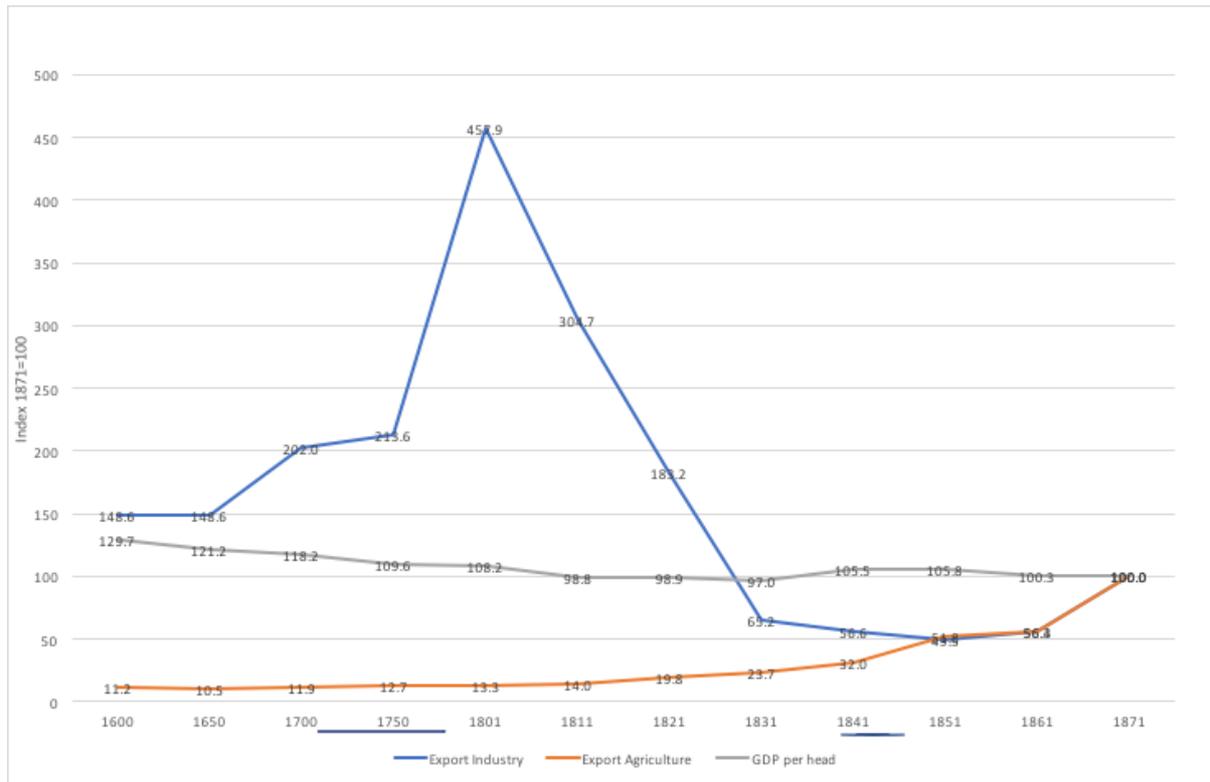
Source: Constructed using data from Broadberry *et al* (2015), table 2.

Figure 2: *Measuring the Great Divergence in Per Capita GDP in 1990 Geary Khamis \$ (1600-1871)*



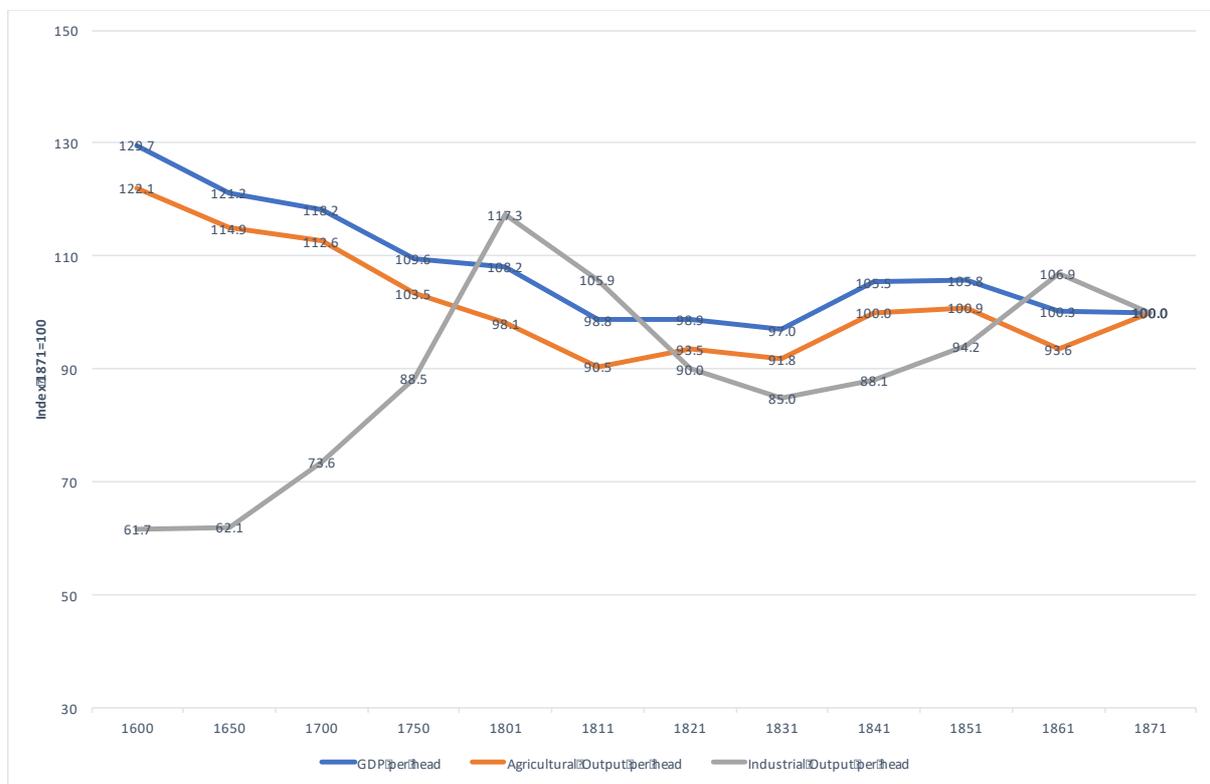
Source: Constructed using data from Broadberry *et al* (2015)

Figure 3A: Trend in GDP per capita and its Export Components from 1600-1871 (1871=100)



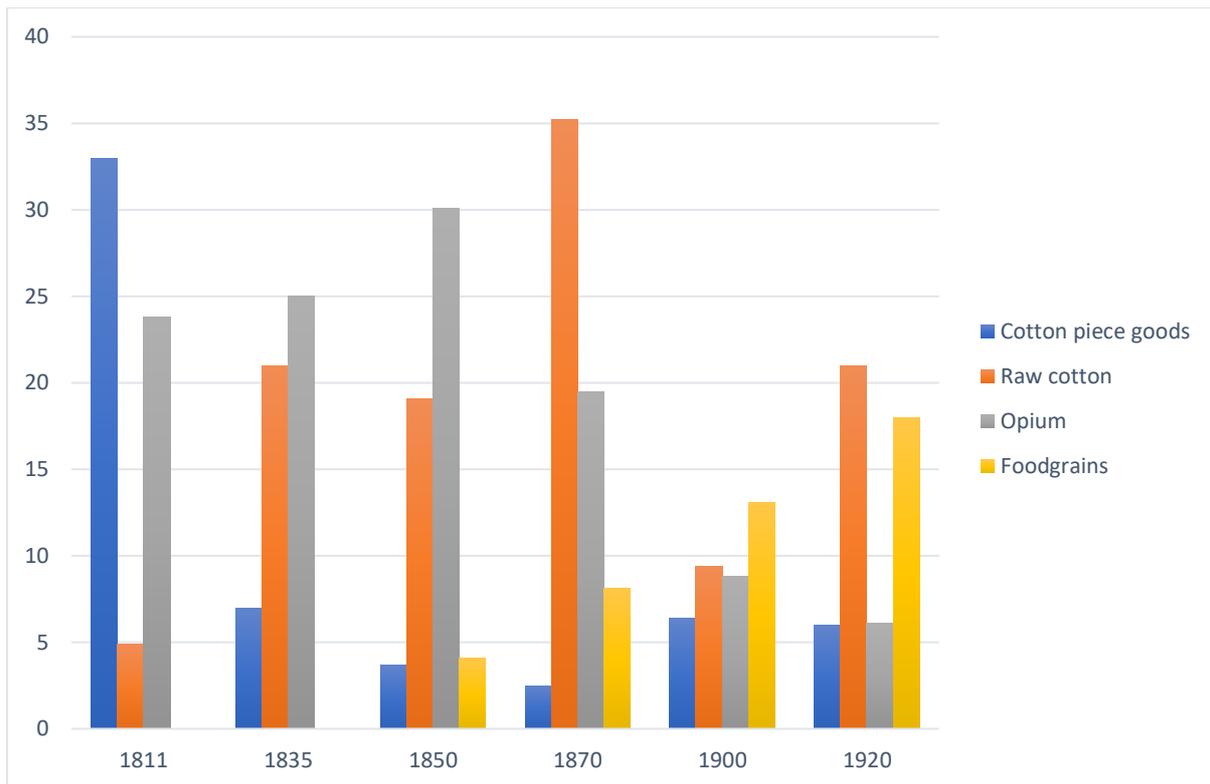
Source: Calculated from Broadberry *et al* (2015)

Figure 3B: Trend in GDP Per Capita, Agricultural Output and Industrial Output from 1600-1871 (1871=100)



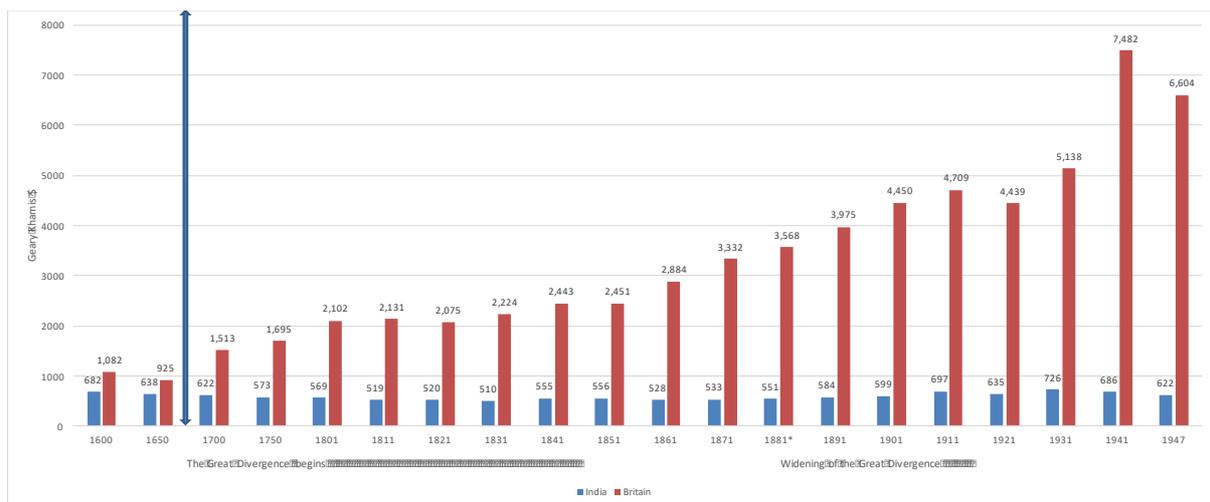
Source: Calculated from Broadberry *et al* (2015)

Figure 4: *Composition of Trade (% Share)*



Source: Statistical Abstracts of British India for post 1850 data and CEHI, Chapter 10, table 10))

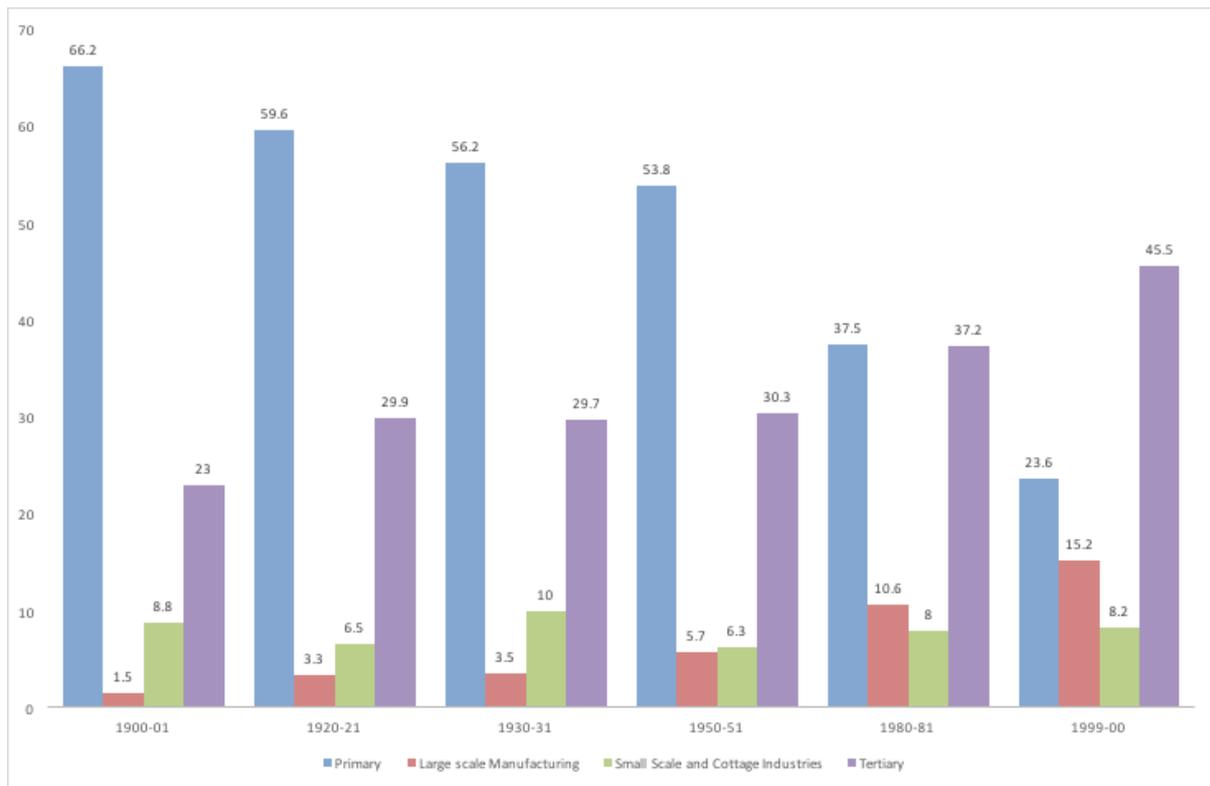
Figure 5: *Increasing Divergence between India and Britain in Per Capita GDP in 1990 Geary Khamis \$ (1600-1947)*



Source: Broadberry et al (2015) and Maddison Project database

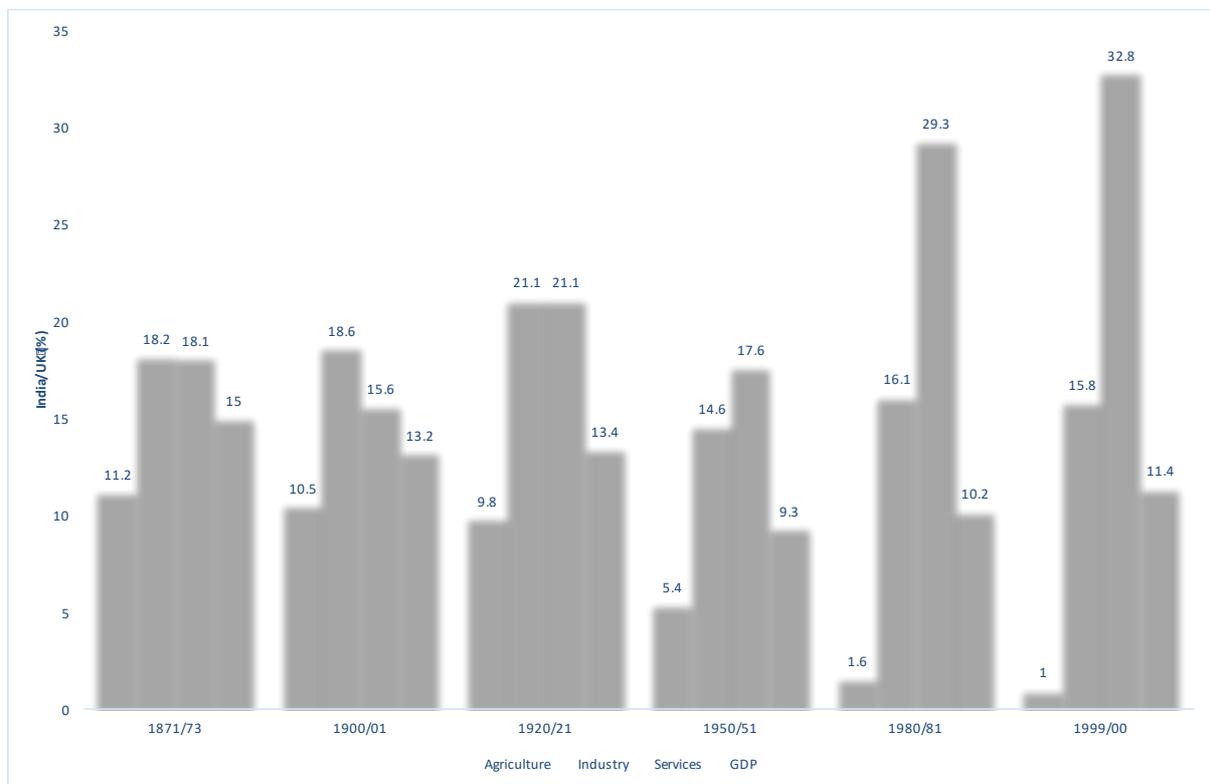
<http://www.ggdc.net/maddison/maddison-project/data.htm>

Figure 6: *Changes in Sectoral Shares in GDP (%)*



Source: Sivasubramonian (2000)

Figure 7: *Sectoral Productivity Differences with UK (% India/UK)*



Source: Broadberry and Gupta (2010)