

Chapter 8

Historical Roots of Industrialisation and the Emerging State in Colonial India



Chikayoshi Nomura

8.1 Introduction

Following a clear shift towards economic liberalisation in economic policy in the early 1980s, India's economic growth rate rose from the notorious 'Hindu growth rate' of 3% to over 6%, helping improve the welfare standard of its one billion plus population, while providing market opportunities to producers and investors elsewhere in the world. The high growth rate resulted in the awakening of India, which has received worldwide attention.

One of the driving forces of the high growth rate is the expansion for 3 decades in the activities of private industrial enterprises, whose origins date back to the colonial era. By the time of independence, India already had various 'modern' industrial sectors covering mining, textile, iron and steel, and chemical. Some had even reached global standards in terms of production and employment, although the overall industrialisation level was far from sufficient. The history of active private industrial enterprise has formed one of the important foundations of the current high rate growth of Indian economy since the early 1980s. This chapter reviews India's industrialisation in the colonial era, focusing on its stagnated nature and three known hypotheses on the causes of the stagnation.

The chapter consists of six sections. Section 8.2 reviews the stagnated nature of colonial India's industrialisation. The next three sections review three hypotheses on the possible causes of the stagnated industrial development in colonial India. Section 8.3 addresses the common hypothesis proposed by scholars such as

I cordially appreciate encouraging and illuminating comments I received from the editors and contributors of this book for the past 2 years. Needless to say, all responsibility of any possible errors solely rest upon me.

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K. Otsuka and K. Sugihara (eds.), *Paths to the Emerging State in Asia and Africa*,
Emerging-Economy State and International Policy Studies,
https://doi.org/10.1007/978-981-13-3131-2_8

M.D. Morris, which argues that India's limited progress in industrialisation can be explained by its labour abundant and capital scarce mix of factor endowments. Section 8.4 deals with another well-known hypothesis advanced by scholars such as A.K. Bagchi, which argues that the adoption of laissez-faire economic policies, which was part of a pivotal framework of British rule in colonial India, explains the stagnated industrial growth based on the understanding that proactive government interventions in economic activities can promote industrialisation. Section 8.5 addresses a persuasive hypothesis advanced mainly by Japanese economists (Kiyokawa 1976a, b, 1983; Otsuka et al. 1988) that compared growth in cotton textile industries in colonial India and imperial Japan, and conclude that India's stagnated industrialisation can be explained by factors related to its insufficient adoption and innovation of useful technological knowledge. They argue that institutional and organisational factors, such as the weak technical education system or insufficient long-term perspective of management, conditioned colonial India's sluggish technology transfer and innovation. The final section offers conclusions.

8.2 Stagnated Industrialisation in Colonial India

'Modern' industrial enterprises in colonial India started to grow in the mid-19th century. The derivation of the monopolistic status of East India Company in the early 19th century fostered buoyant private economic activities in India, where modern industrial enterprises financed both by British and Indian capital were set up in various fields. The cotton milling business grew steadily throughout the second half of the 19th century, achieving high international competitiveness as early as the end

Table 8.1 Top seven cotton spindle holding countries (1,000)

	U.K.	U.S	Germany	France	India	Russia	Japan
1875	n.a.	n.a.	4,700	5,000	<i>1,100</i>	n.a.	n.a.
1880	n.a.	<i>10,653</i>	4,800	4,800	<i>1,464</i>	4,400	n.a.
1890	40,512	<i>14,384</i>	6,071	5,040	<i>3,274</i>	6,000	358
1900	n.a.	<i>19,472</i>	<i>8,031</i>	n.a.	<i>4,945</i>	n.a.	<i>1,274</i>
1910	53,400	28,000	9,900	6,700	6,058	7,900	1,955
1925	57,200	37,937	9,500	9,428	8,500	n.a.	5,292
1930	55,200	34,031	11,070	10,250	8,907	7,624	7,072
1935	42,700	30,110	n.a.	10,157	9,613	9,800	9,944

Source Mitchell (1980, 1982, 1983, 1988). Bombay Millowners' Association. *Report of the millowners' association*, Bombay

Note 1 The table are sorted by descending order in 1930

Note 2 Data in italic are from Bombay Millowners' Association

Table 8.2 Top nine pig iron producers (1,000 metric tons)

	U.S.	France	Germany	U.K.	Russia	Belgium	Czechoslovakia	India	Japan
1900	14,011	2,714	7,550	8,960	2,937	1,019	n.a.	n.a.	30
1910	27,742	4,038	13,111	10,012	3,047	1,852	n.a.	n.a.	72
1915	30,396	584	10,190	8,794	3,764	68	n.a.	250	321
1925	37,289	8,494	10,177	6,262	1,309	2,543	1,166	902	697
1930	32,261	10,035	9,695	6,192	4,964	3,365	1,437	1,199	1,188
1935	21,715	5,789	12,846	6,424	12,490	3,030	811	1,490	1,965

Source Mitchell (1980, 1982, 1983, 1988)

Note 1 The table is sorted by descending order in 1930

Table 8.3 Manufacturing production 1926–28

	Manufacturing (million US\$)	Imports of manufactured articles (million US\$)	Exports of manufactured articles (million US\$)	Manufacturing per head (US\$)
U.S.	42,200	1,064	2,027	350
Germany	11,500	512	2,001	180
U.K.	9,400	1,069	2,790	190
France	6,600	336	1,356	160
USSR	4,300	175	53	30
Italy	3,300	259	401	80
Japan	2,500	241	451	40
Canada	2,400	627	336	250
Belgium	1,900	209	448	240
Czechoslovakia	1,600	156	395	110
Australia	1,400	510	30	220
India	1,200	684	305	4

Source League of Nations (1945, p. 84)

of the 19th century.¹ Jute mills also expanded rapidly in Calcutta in response to a mounting global demand for ropes and other products, occupying a large share of the international market by the late 19th century. In addition, brewing, paper-milling, leather-making, matches, and rice-milling industries also developed during the century, while heavy industries such as the iron industry were also established as early as 1814 by British capital.

Due to progress in modern industrial enterprises, some industries reached global standards by the beginning of the 20th century. The cotton mill industry in India had 9 million spindles in the 1930s, which placed India fifth globally in terms of the number of spindles (Table 8.1). The Indian jute mill industry was the largest in the world in terms of the amount of raw jute consumed for production at the end of the 19th century. India's iron industry was ranked eighth in the world in terms of output in 1930 (Table 8.2). Just before the Great Depression, India was ranked as the twelfth largest industrialised country measured by the value of manufacturing products (Table 8.3).

This comparatively steady progress of industrial production in colonial India was not accompanied by a general transformation in its economic structure, which is, according to Kuznets, represented by a rise in the share of the manufacturing sector against GDP/NDP. Kuznets shows that the industry share in the UK rose from 34% in 1841 to 40% in 1901. In the US, which was late to industrialisation, the share rose from 31% in 1839 to 51% in 1879 (Kuznets 1966). India's industrial growth

¹The Indian cotton mill industry's high international competitiveness in the second half of the 19th century is reviewed in Sect. 8.4 of this chapter.

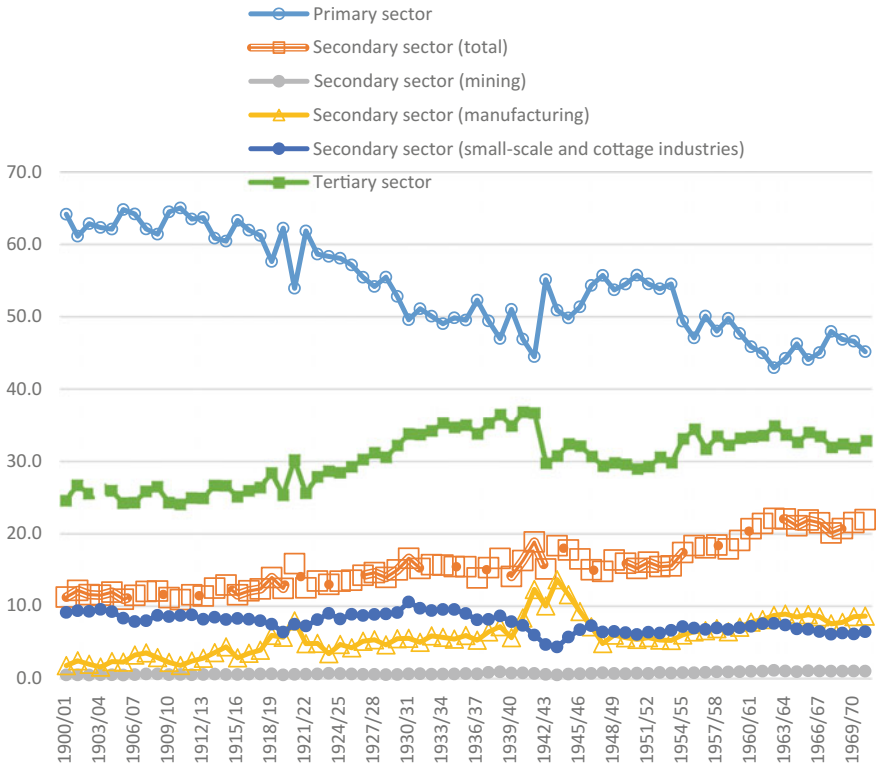


Fig. 8.1 Sector shares in NDP in India. Source Sivasubramonian (2000)

was insufficient to bring such general transformation in its economic structure, and the net domestic product (NDP) share of the manufacturing sector (excluding small scale and cottage industries) barely reached 7% even in 1946. India’s slow progress is conspicuous in comparison to the astonishing progress of another early industrialising country in Asia, Japan. According to Fig. 8.1, the share of the manufacturing sector in India (total of manufacturing and small scale and cottage industries) in total NDP grew gradually from approximately 10% in the early 20th century to over 20% in the 1960s. On the other hand, Japan’s manufacturing sector share, which also includes the shares of large- and small-scale industrial manufacturing enterprises, reached over 30% as early as in the 1930s (Fig. 8.2). Considering its slow progress, the share of factory employment in India was also small (i.e. 0.4% of the total population in 1900 and 1.4% in 1941). In Japan, it was 1.6% in 1900 and reached 9.9% in 1940 (Umemura et al. 1988). The slow transformation of the economic structure formed the foundation of the long-held understanding that India’s industrialisation stagnated under the British colonial regime.

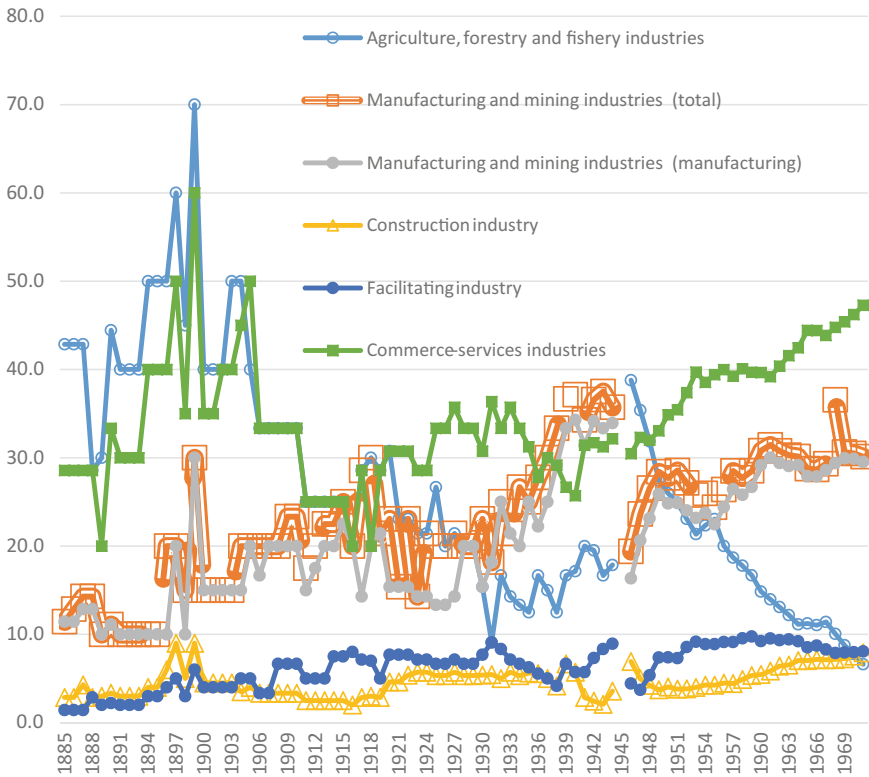


Fig. 8.2 Sector shares in GDP in Japan. *Source* Okawa et al. (1974)

8.3 Factor Endowment Hypothesis

8.3.1 Overview

In the mainstream economic history of colonial India, there are two main hypotheses that explain its stagnated industrialisation. The first hypothesis assumes factor endowment as the main cause, while the second considers the laissez-faire economic policy of the colonial government. In the following two sections, we review the general features of the two hypotheses and assess them.

Morris David Morris, a leading proponent of the factor endowment hypothesis, assumes that the Indian economy was driven by market forces led by private initiatives. Morris wrote, ‘the Indian economy in the 19th and first half of the 20th centuries was pre-eminently a private enterprise economy... (whose) economic decisions... were made by private individuals, households, and groups’ (Morris 1987). Morris also assumes that the colonial government played only a limited role in economic affairs in the one and half century of British rule. According to Morris, ‘In no

decade between 1872 and 1947 did the state's annual share of GNP average more than 10%; usually it was less than that' (Morris 1983). Based on the market based understanding of economic activity in India, Morris construes its abundant labour and scarce capital factor endowment as the main causes of stagnated industrialisation. Morris writes,

[Modern economic growth in colonial India had] very serious inhibitions on the supply side... most factors of production were costly... Only raw labour was cheap and on occasion – as in the jute and cotton industries – it provided an industrial advantage. But cheap labour typically worked against mechanisation. The expansion of demand for a product did not necessarily put pressure on labour supply or on labour cost relative to other costs. To the contrary, the businessman was encouraged to expand existing organisation rather than shift to techniques where capital requirements were relatively greater. And even where mechanised industries grew up, they invariably used more cheap labour per unit of capital than was true in the West. All this was a rational response to relative factor price relationships but it slowed the expansion of factory organisation (Morris 1983).

According to Morris, due to its particular factor endowment characteristics, India had less incentives to seek capital-intensive economic growth, which was essential for industrialisation. The view that factor endowment is the main cause of India's stagnated development has been espoused by other recent economic historians, such as Roy and Gupta (Roy 2005, 2006; Gupta 2016).

8.3.2 *Statistical Analysis*

How robust is the hypothesis? We validate the hypothesis by using historical data of recent works, such as Sivasubramonian (2000). More specifically, we compare the wage-rental ratio of colonial India and imperial Japan for several decades from the beginning of the 20th century. Comparing the wage-rental ratios trends in the two early Asian industrialising countries is a worthy first step to test the factor endowment hypothesis for the following two reasons. First, as is well-known, the important features of factor endowment of a specific area/year are well represented by the wage-rental ratio, which is the nominal wage divided by nominal interest rate.² In other words, India's wage-rental ratio should have been relatively lower if it really had abundant labour and capital scarcity in comparison to other countries whose economic development level was higher. Second, the comparative study could aid our assessment of the level of wage-rental ratio in India as India and Japan started industrialisation at almost the same time in the second half of the 19th century. Despite the similarity in its initial starting point for industrialisation, Japan's economy succeeded in growing rapidly from the end of the 19th century, and eventually, its industrialisation outpaced India's from the early 20th century. Clear differences in wage-rental ratios trends between the two countries would indicate that the hypothesis is a good

²To be precise, rental price is equal to 'machine price \times real interest rate + depreciation rate'. Here, we assume that (1) machine prices in colonial India and imperial Japan were the same or had same trends, and (2) depreciation rates in both the countries were the same.

explanation for the sluggish mechanisation and industrialisation of the Indian economy. If there is no such difference, the hypothesis will need to be supplemented by further explanations.

Analysing wage-rental ratio trends requires interest rate and nominal wage data for the long-term. India had three distinct interest rates for short-term lending/borrowing, reflecting the risks involved: bank rate of the quasi-central bank, the *hundi* rate, and the bazaar rate. The bank rate of the quasi-central bank was the rate charged for short-term lending by, for instance, the Bank of Bengal, the Imperial Bank of India, or the Reserve Bank of India, all of which functioned as a bank of bank note issuer, as a bank of the East India Company prior to the mid-19th century, and of the British government of India subsequently, and as a deposit bank under strict regulation of the East India Company and the British government. These quasi-central banks supplied short-term capital to leading financial and commercial agencies using a discount rate, which is called the bank rate. Bagchi mentions that the discount rate was higher than 2% of the bank rate of the Bank of England, and was influenced by the bank rate of the central bank in London (Bagchi 1997). The *hundi* rate was used by large-scale local bankers for their short-term lending to small-scale manufactures and traders. The bazaar rate was charged by money lenders for short-term lending to the wider public, and was generally much higher than the other two types of interest rates.

Banking and Monetary Statistics (BMS), published in 1954 by the Reserve Bank of India, the central bank of independent India, included data on these interest rates, some of which date back to the early 20th century. According to the BMS, discount rates of the Bank of Bengal (January–June) remained relatively stable at 6% prior to the end of the 1910s (average 6.44%; min. 5.56% in 1904; max. 7.25 in 1915) (Fig. 8.3). The corresponding rates in the 1920s (bank rate of the Imperial Bank of India) hiked in the 1920s, reaching 8.05% in 1924 when the Indian money market experienced shortage of market liquidity owing to the Indian government's joint use of the retrenchment policy and increase in government bond issue. The discount rates gradually returned to pre-war levels after the mid-1920s, reaching 6.02% in 1932. In 1933, the rate plunged to 3.5% and remained at the level throughout the 1930s. *Hundi* rates, whose data is available for 1909 and after, were generally lower than the bank rates of the quasi-central bank of colonial India in the 20th century. It was approximately 4% before WW1, rose to 5–7% for almost 15 years after the outbreak of the war, and sharply decreased to 3% after 1933. For bazaar rates, whose data is available only after 1922, the BMS shows that the rates were much higher than the other two. For instance, the Calcutta bazaar rate in June remained approximately 9–10% for a decade from 1922. Even after 1933 when the above two rates plummeted, the bazaar rate in Calcutta remained as high as 7.5%, although it decreased to 5.5% in 1936.

In terms of nominal interests, we observe that India did not suffer from a shortage of short-term capital in comparison to Japan. Japan had two short-term lending/borrowing interest rates: the bank rate of the Bank of Japan and the market rates of major private banks. The two Japanese rates correspond to the first two interest rates in India. Bank rates of the Bank of Japan, the central bank of Japan, were used for money lent for securities and roughly corresponds to the bank rate in India. The

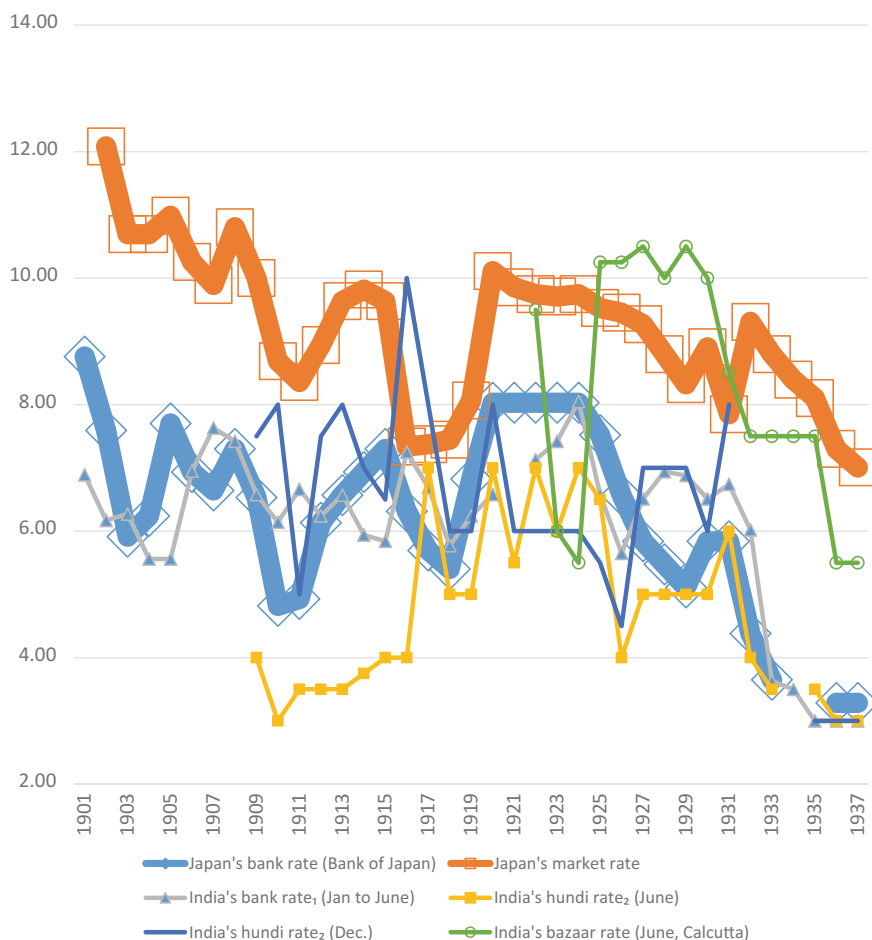


Fig. 8.3 Nominal short term interest rates (%). Sources Nomura (2018). Note 1 India's bank rates from Jan. to June were generally higher than those from July to Dec. Note 2 India's hundi rates in June were generally equivalent to the average annual rates

market rate, which was used by major private financial institutions for short-term lending (less than 3 months), roughly corresponds to the *hundi* rate of colonial India. According to *The Oriental Economists Yearbook (Keizai nenkan)*, the bank rates in the 1900s were approximately 6%, as were the Indian bank rates, although there were relatively larger fluctuations (average 6.55%; min. 4.82 in 1910; max. 8.76 in 1901) (Fig. 8.3). The bank rate rose to 8.03% in 1920 and remained at that rate until 1924. Subsequent to 1925, the rate started to decrease gradually and reached 5.84 in 1931, then it suddenly dropped to 4.38% in 1932, 3.65% in 1933, and 3.29% in 1936. These bank rate trends in Japan indicate that there were no clear differences in bank rates of the central/quasi-central banks in Japan and India.

Considering the market rate, the rates in Japan were in general higher than the *hundi* rates, the corresponding Indian rates. *The Oriental Economists Yearbook* shows that the Japanese market rate remained over 10% in the 1900s, except for 9.89% in 1907 (Fig. 8.3). The rate decreased to approximately 7–9% throughout the 1910s; however, it rose again to over 9% in the first half of the 1920s. Subsequent to the mid-1920s, the rates started to decrease gradually from 9.45% in 1926 to 7.85 in 1931, and rose again in 1932 to reach 9.31, although the rates gradually declined again after that year to 7.01% in 1937. Overall, the Japanese market rate trends clearly indicate that leading private financial institutions charged higher interest rates for their short-term lending than India's financial institutions. Surprisingly, Japanese market rates in the 1930s were higher than India's bazaar rates, which have been notorious among economic historians of colonial India for its exploitive nature.

This clearly indicates that India suffered from short-term capital supply less seriously than Japan throughout the first half of the 20th century when the two countries started to show distinct patterns of industrial development.

To test the factor endowment hypothesis, we not only compare interest rate trends, but also nominal wage trends in India and Japan. For data on long-term nominal wages in manufacturing in India, we use Sivasubramonian's estimation of daily nominal wages of skilled and unskilled labour at 'small-scale and cottage industries' spanning 47 years from 1900/01 (Sivasubramonian 2000). Sivasubramonian defines carpenters, blacksmiths, and masons as skilled labour, and weavers and potters as unskilled labour. Unfortunately, Sivasubramonian did not estimate similar long-term nominal wage trends of workers in 'modern' manufacturing sectors, such as the cotton mill industry. However, we can assume that wages at 'small-scale and cottage industries' approximate wages at similar posts in modern manufacturing sectors as India already had high labour mobility in general by the end of the 19th century, as Bagchi stresses (Bagchi 1972).

After carefully analysing several historical wage data utilised by economic historians, Sivasubramonian estimated that the nominal daily wages of urban skilled labour, most of whom were adult male, grew steadily from Rs. 0.51 in 1900 to Rs. 0.90 in 1917 (Fig. 8.4). After 1918, wages started increasing marginally, rising from Rs. 0.99 in 1918 to Rs. 1.60 in 1925. After peaking in 1925, the nominal daily wages of urban skilled labour in India began to decrease gradually in the 1920s and rapidly in the 1930s, returning to the level of 1918, Rs. 1.01, in 1939. Sivasubramonian also estimated the nominal daily wages of unskilled labour and those of cotton weavers, most of whom were adult male. Both unskilled labour and cotton weavers, who may have be 'slightly better off than the agricultural labourers in the rural areas' (Sivasubramonian 2000), received almost half of the wages of urban skilled workers. The nominal daily wages of unskilled labour steadily grew from Rs. 0.25 in 1900 to Rs. 0.48 in 1917. After 1918, it rose marginally, as did for urban skilled labour. The wages rose from Rs. 0.53 in 1918 to Rs. 0.82 in 1925. Further, the wage started to decrease from Rs. 0.80 in 1926 to Rs. 0.46 in 1939, gradually in the 1920s and rapidly in the 1930s. The nominal daily wages of cotton weavers, whose data are available only for 11 years from 1910, were similar to the wages of unskilled labour, which validated Sivasubramonian's classification of weavers as unskilled labour.

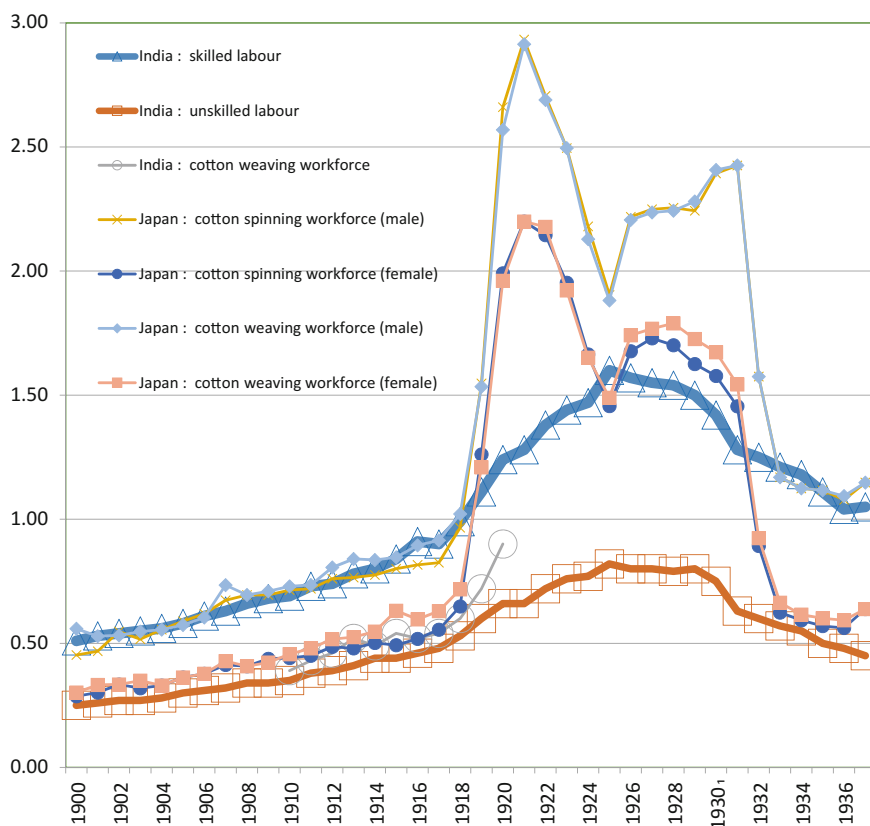


Fig. 8.4 Nominal daily wages for manufacturing labours (in Indian rupee). *Sources* Nomura (2018)
Note 1 The sharp drop in wages in Japan during the 1930s was due to a marked decline in yen-based nominal wages and a sudden depreciation of the yen against the rupee after 1931 (Rs./Yen decreased from 1.47 in 1931 to 1.05 in 1932 and 0.79 in 1933)

The nominal daily wages in India was not so different from that in Japan in the first and last years of the first half of the 20th century. According to Fujino (Fujino et al. 1979), a pioneering compilation work of economic statistics of modern Japan, rupee-based nominal daily wages of male workers of the cotton spinning and weaving sector of Japan, which was one of the leading ‘modern’ manufacturing sectors in Japan, were at similar levels to India’s urban skilled workers in small-scale and cottage industries before 1918 and after 1933 (Fig. 8.4). Additionally, Sivasubramonian (2000) and Fujino (Fujino et al. 1979) jointly show that rupee-based nominal daily wages of ‘female’ workers of the Japanese cotton and spinning sector in two periods (before 1918 and after 1933) were only approximately 10–20% higher than the rupee-based nominal daily wages of Indian unskilled adult worker, who were ‘slightly better off than the agricultural labourers in the rural areas’ (Sivasubramonian 2000). Wage trends in the two countries diverged for 15 years after 1918, although the difference

disappeared completely in the early 1930s due to the sharp decline in Japanese yen-based nominal wages in Japan, and a marked depreciation of the Japanese yen against the Indian rupee after 1931 (Rs./Yen decreased from 1.47 in 1931 to 1.05 in 1932, and 0.79 in 1933).

We should pay special attention to two facts in assessing the above-mentioned wage trends in the two countries. First, female workers were the majority in some leading ‘modern’ manufacturing sectors in Japan, such as the cotton mill industry, while adult males constituted the majority in most of the ‘modern’ as well as traditional manufacturing sectors in India. Second, as was pointed out previously, Indian skilled and semi-skilled workers at ‘modern’ business enterprises and those at ‘small-scale and cottage industries’ could be construed to have received approximately similar wages for the following reasons. *Prices and Wages*, one of the most well-known historical statistics of colonial India, indicates that both sizers in the sizing department and slubbers in the card-room department of India’s cotton mills received approximately similar wages to those of blacksmiths and carpenters working at Indian railway companies in the early 20th century. Assuming that blacksmiths and carpenters working at railway companies and those working at small-scale or cottage industries received similar wages in a highly mobile labour market due to similarity in job specifications, Indian male adult workers at skilled or semi-skilled posts of ‘modern’ manufacturing sector, such as slubbers in the card-room department of cotton mills, may have received, at least, similar nominal wages to that of skilled labour such as blacksmiths or carpenters as shown in Fig. 8.4. Based on these two facts, we conclude that Indian workers in manufacturing received no less than the amount of nominal daily wages received by workers at ‘modern’ manufacturing sector in Japan in the two periods (before 1918 and after 1933).

Comparing interest rates and nominal wages in India and Japan does not lead to the conclusion that India was capital scarce and labour abundant at least in comparison to Japan in the early 20th century. Rather, India’s factor endowment was similar to that of Japan in the time period. Despite the similarity, India failed in achieving similar pattern of ‘labour intensive’ industrialisation that Japan achieved since the end of the 19th century, during which time, the labour intensive industrialisation led Japan’s modern economic growth in its early phase. What could explain the causes of the failure of colonial India’s labour intensive industrialisation? We will check with another hypothesis that has been proposed to answer the question.

8.4 Laissez-Faire Economic Policy Hypothesis

8.4.1 Overview

Based on the understanding that governments can lead industrialisation through comprehensive interventions in economic activities, scholars such as Amiya Kumar Bagchi stress that India could have developed its industries more robustly if the colo-

nial government had taken interventionist policies to boost overall industrial development (Bagchi 1972). They assume that the colonial government had no intention or capacity to undertake such interventionist economic policies as the government considered laissez-faire policies as its pivotal policy framework to protect British interests in colonial India. Under the common acceptance of market mechanisms guided by the 'invisible hand', the colonial government assumed that laissez-faire policies merited both British and Indian interests. Additionally, this framework was welcomed by the colonial government as it significantly limited the scope of colonial governance and left wide-ranging, sometimes bothersome, business matters in the hands of private entities. This non-interventionist philosophy is well summarised by Morris David Morris, who wrote that 'there can be no question that in India during the century and a half of British rule the market was given its head. British India was one of the great social experiments in letting self-interest and market forces do virtually everything' (Morris 1987). The laissez-faire economic policy framework, according to Bagchi and others, resulted in stagnated industrialisation in colonial India.

8.4.2 Statistical Analysis

Testing the entire scope of the laissez-faire economic policy hypothesis is beyond the capacity of this short essay. On the one hand, the assertion that weak government intervention caused stagnation in industrialisation is a challenging hypothesis to prove, considering the weak performance in the post-colonial era when interventionist policies were adopted. On the other hand, we also know that some types of interventions into the economy could help promote industrial growth from the case study of Asian Miracle stories in South Korea after 1960s and Southeast Asian countries after the 1970s, when developmental directorships played a part in raising the growth rate of the manufacturing sector in these countries. A full assessment requires an in-depth investigation on government interventions that could have potentially affected industrial growth. This requires a full-fledged analysis on an optimal interventionist policy portfolio, and any negative influence by laissez-faire policies on such a portfolio. Such an analysis is far beyond the scope of this short essay. Leaving the full-fledged analysis for future work, this section describes the basic features of India's laissez-faire economic policy framework as an initial step in verifying this hypothesis. Similar to the above section, we use historical data that have been compiled by recent scholars.

An important feature of the Indian laissez-faire policies was the limited share of government revenue in the total GDP, which Morris refers to in his quote mentioned above, and is verified by historical data. Figures 8.5 and 8.6 indicate the shares of total government revenue in the total GDP/NDP for India, Japan, and the UK prior to the 1940s. The figures clearly indicate the limited annual financial capacity of the Indian government in comparison to the other two countries. Figure 8.5 also indicates that India's limited capacity declined until the end of the 1920s, although it increased

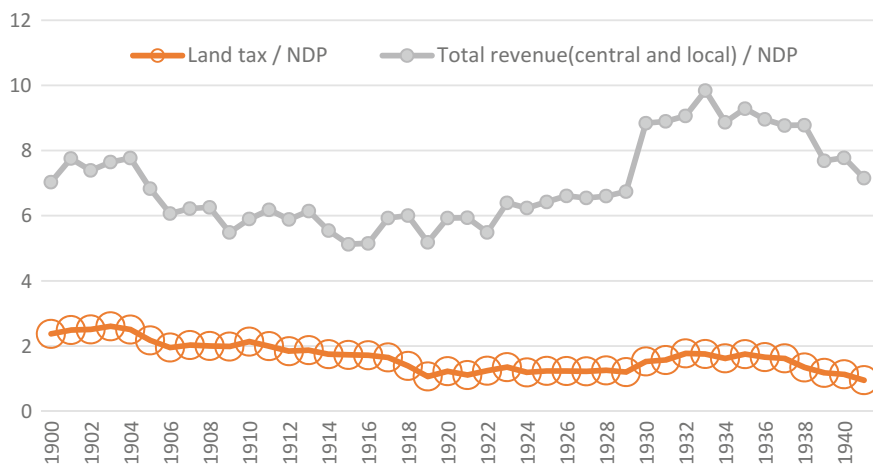


Fig. 8.5 India's share of government revenue against NDP. *Source* Data of NDP from Sivasubramanian (2000). Data of British India's government revenue from Reserve Bank of India (1954). Data of population size of British India and princely states from Government of India. *Statistical Abstract of British India*. New Delhi: Department of Commercial Intelligence and Statistics. *Note 1* The government revenue includes revenues of both British India's central and local government of, which was separated from the central government after an enactment of the Government of India Act 1919. *Note 2* Original data of the government revenue in *Banking and Monetary Statistics* includes only central and local government revenue of British India, while excluding data on revenue of princely states. We estimate the government revenue of the princely state based on their relative size of population. According to *Statistical Abstract of British India*, total population in British India and princely states are as follows. 231 million and 63 million in 1901, 244 million and 70 million in 1911, 247 million and 71 million in 1921, and 271 million and 81 million in 1931. Based on these figures, we assume that the government revenue of the princely states were 22% of the government revenue of British India throughout the period of the figure. On the assumption, we firstly estimated total government revenue of India. And then, to figure out the India's revenue share in NDP, the estimated government revenue of India was divided by Sivasubramanian's total India's NDP, which includes NDP data of both British India and princely states

in the 1930s largely owing to the sharp drop in NDP in the decades following the Great Depression.

In addition to the relative scale of government revenue in the total GDP/NDP, the absolute scale of India's government revenue was smaller, for instance, than that of Japan. As Fig. 8.7 indicates, initially, India's revenue gradually grew at a similar pace to that of Japan. This may lead some to conclude that the relatively smaller share of Indian revenue against its NDP should not be overemphasised. However, as the figure also indicates, Japan's revenue scale outpaced India's after the early 1920s when its revenue scale stagnated. More importantly, India's government revenue maintained the welfare standard of its population, which was more than 200 million as early as in the 20th century, when the population in Japan was only approximately 60 million. Moreover, the Indian government was required to spend approximately 30% of its revenue on defence, part of which was used to maintain British troops inside and

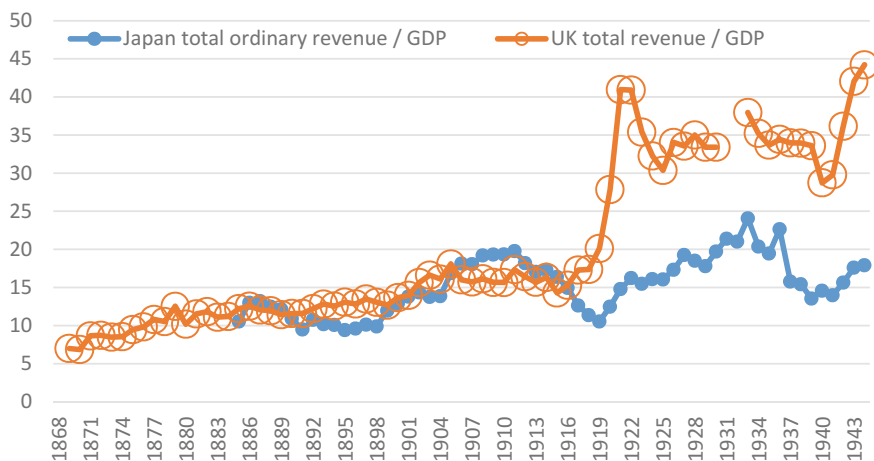


Fig. 8.6 Japan and the UK’s share of government revenue against GDP. *Source* Data of Japan’s government revenue from Emi and Shionoya (1966). Data of Japan’s GDP from Okawa et al. (1974). Data of the UK from Mitchell (1988). *Note 1* The government revenues include revenues of both central and local government in the respective countries

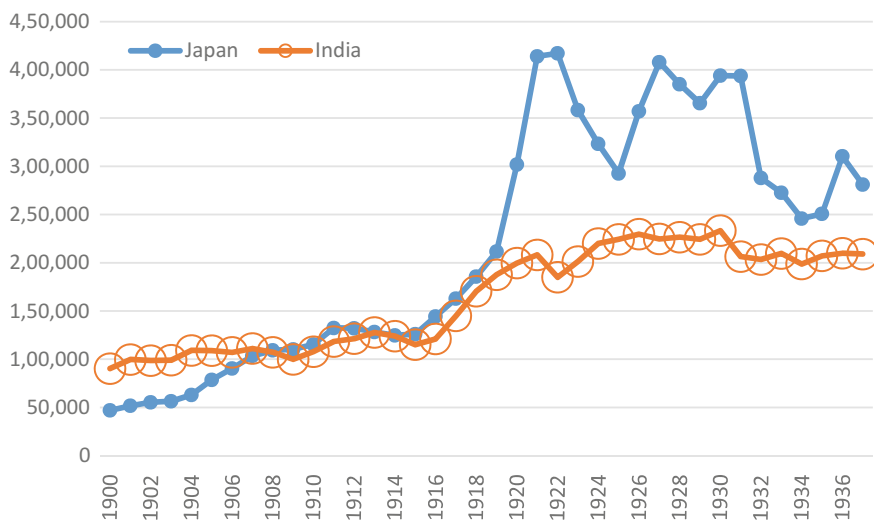


Fig. 8.7 Government revenue (absolute figure in million rupee). *Source* Data of exchange rate from same source with Fig. 8.4. Other data are from same sources with Figs. 8.5 and 8.6

outside India. Overall, the Indian government’s revenue was, as acknowledged by economic historians, small not only in its relative scale, but also in absolute terms.

One of the leading causes of the limited capacity of government revenue is the land tax assessment system called the ‘permanent settlement system’, which was applied to the leading part of the colony from the early stage of colonial rule in

the late 18th century. Under the system, land tax per acre was fixed at the initial stage of colonial governance in the late 18th century. It was fixed to avoid costs related to reassessment of the rates, as well as insurgency risks by taxpayers against any reassessments. As a result, government revenue, as is clearly shown in Fig. 8.5, suffered from a gradual decline in real terms owing to the steady rise in general prices throughout the colonial period (Kumar 1983). The inability to raise revenue from lands through a reassessment may imply limited legitimacy of the colonial government to govern its subjects.

The Indian government's limited financial capacity is also observed in Fig. 8.8, which shows the shares of the central government's public debt against GDP/NDP of India, Japan, and the UK until the 1940s. According to the figure, India's share (total of debt in rupees and in sterling) was higher than its counterparts in the early 1900s. This is owing to the UK's strict observance of liberalisation economic policies, as well as Japan's weak capacity to borrow from abroad at that time. However, the Indian government strengthened its conservative debt policy throughout the period, while its counterparts expanded their debt, particularly after WWI.

Attempts by the Indian government to limit its public debt to a 'necessary minimum' are well-known among economic historians as an important feature of its 'imperial commitment'. For instance, Brian Tomlinson, a well-known economic historian of colonial India, explained it as follows. '[as a colonial state forming a part of British empire], irreducible minimum' for Government of India were 'to provide a market for British goods, to pay interest on the sterling debt and other charges that fell due in London, and to maintain a large number of British troops from local revenues and make a part of the Indian army available for imperial garrisons' (Tomlinson 2013). Tomlinson called this irreducible minimum an 'imperial commitment', which shaped British policy foundation in India. Tomlinson argues that the Indian government adopted an automatic, self-regulating system of currency management to protect British investor interests. Imperial commitment resulted in Indian officials not playing an active role in matters important to the domestic economy, as seen in the limited public debt during the colonial period, which in other words, indicates India's strict observance of conservative fiscal policy throughout the colonial period.

The significance of the imperial commitment is also observed in India's exchange rate policy, which has also received wide scholarly attention. Before the end of the 19th century, India employed the silver standard, while the UK employed the gold standard. Subsequent to the early 1870s, when silver prices began to decline due to the decisions of leading European countries to employ the gold standard, the rupee exchange rate declined abruptly against the sterling pound. To tackle the decreasing value of the rupee against the sterling pound and to stabilise international finance, the Indian government decided to introduce the gold exchange standard by the early 20th century. Figure 8.9 shows that the rupee exchange rate against the sterling pound remained stable for over a century since the early 19th century, despite the difference in the economic growth rate between India and the UK in the period. On the one hand, the stable exchange rate trend helped British investments by reducing the exchange rate risk in India, which occupied a large part of British overseas investment since

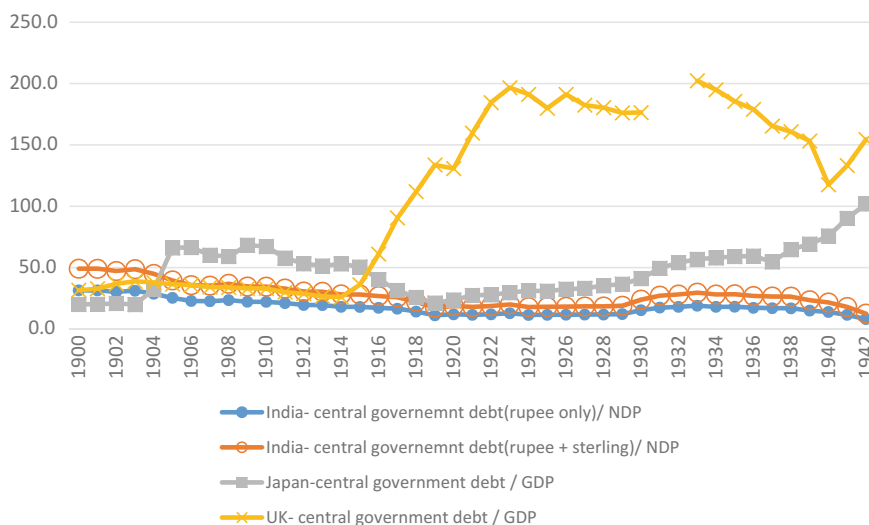


Fig. 8.8 Shares of central government's public debt against GDP/NDP. *Source* Data of India's NDP from Sivasubramonian (2000). Data of British India's central government debt from Reserve Bank of India (1954). Data of Japan's GDP from Okawa et al. (1974). Data of Japan's central government debt from Emi et al. (1988); Toyo Keizai Shinposha, *The Oriental economist* (Toyo Keizai Shinposha), Tokyo: Toyo Keizai Shinposha. Data of the UK from Mitchell (1988). *Note 1* As was the case of Fig. 8.5, original data of the government revenue in *Banking and Monetary Statistics* includes only central government debt of British India, excluding data on princely states' debt. Again, using the population size, we assume that the princely states' government debt were 22% of the government debt of British India. On the assumption, we estimated total central government debt of India. And then, to figure out the India's central government debt share in NDP, the estimated central government debt of India was divided by Sivasubramonian's total India's NDP, which includes NDP data of both British India and princely states

the mid-19th century, while on the other hand, the stabilised exchange rate limited the flexibility in managing fiscal and financial policies for the colonial government.³

Under the non-interventionist, 'experimental' *laissez-faire* policies, the Indian government limited its intervention to the minimum, leaving the coordination of economic transactions to the market. Among the market fundamentalist economic policies, the tariff policy is well-known. For instance, general import duty was reduced from 10% in the early 1860s to zero in 1882. India's tariff rate remained low at approximately 5% before the 1920s, while the rate rose drastically after that due

³Figure 8.9 also shows the exchange rate trends of Japanese yen against sterling pound since 1895. The figure indicates that Japanese yen gradually decreased its value against the Indian rupee in the 1920s and abruptly in the 1930s. The relative decrease in the Japanese yen value against the Indian rupee roughly went along with the positive debt policy of imperial Japan after WWI, which is shown in Fig. 8.8.

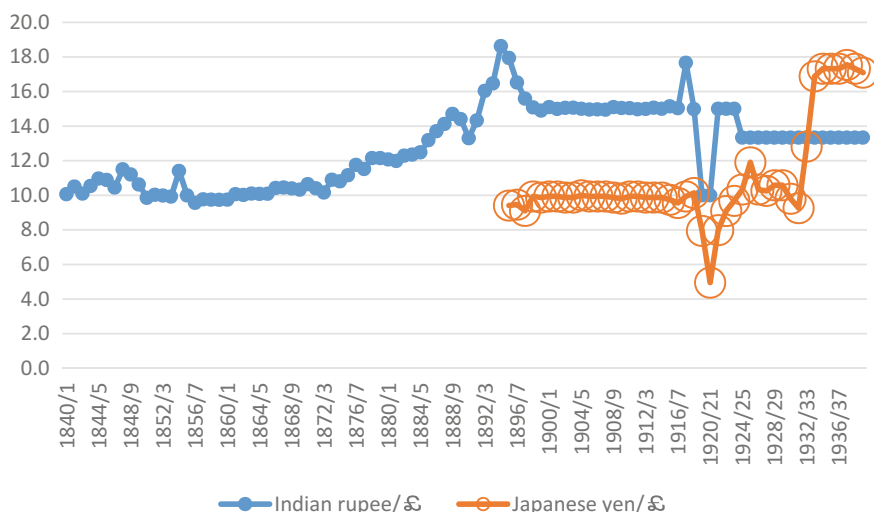


Fig. 8.9 Exchange rate of Indian rupee and Japanese yen against Sterling pound. *Source* Indian rupee data before 1918/19 from Shirras (1920). Indian rupee data after 1919/20 from Government of India. *Statistical Abstract of British India*. New Delhi: Department of Commercial Intelligence and Statistics. Japanese yen data from Government of Japan (1949)

to various reasons, one of which was the fiscal stringency of the colonial government (Fig. 8.10).⁴

Another significant policy under the *laissez-faire* policy framework was the policy to invest in transportation facilities to promote free trade. One of the most influential transportation facilities was the railway network. An initial attempt to construct railway networks dates back to the 1840s, when the then Governor-General of India proposed the construction of a railway network to promote trade, administrative, and military efficiency. Under his leadership, the first railway company was incorporated in 1849, which was followed by additional networks, and resulted in the Indian railway networks ranking fourth in operated lines globally in 1913.

The historical data based test on Indian policy choices validate the hypothesis that it operated under a strict *laissez-faire* policy framework. The colonial government limited its commitment to the economy to a lesser extent than the Japanese or British governments, while the private sector thrived under this framework.

The free rein given to private business entities formed a foundation for the growth of modern industrial enterprises in India. However, it is also clear that these policies led to limited industrial development. This recognition may have led to the adoption of proactive government interventionist policies after independence. As we have already mentioned, fully addressing the impact of the *laissez-faire* economic policy framework on stagnated industrialisation is left for future work.

⁴Figures 8.5 and 8.10 jointly indicate that custom revenue helped the government to maintain its revenue share among NDP, particularly after WWI.

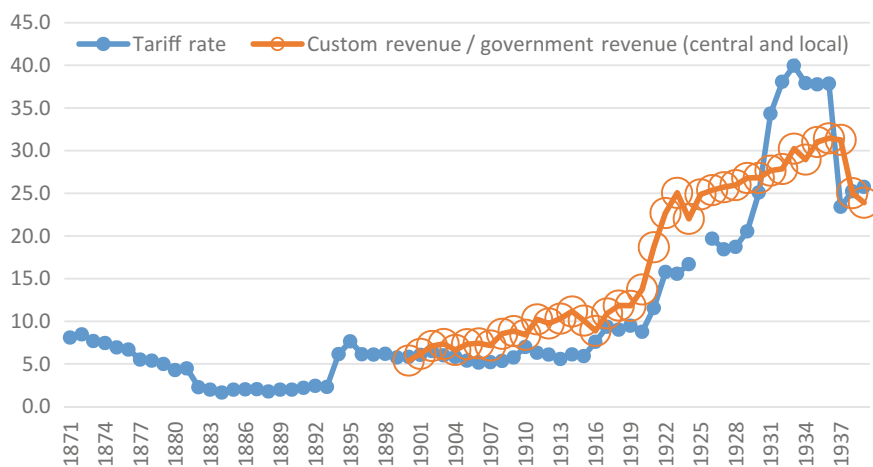


Fig. 8.10 Import tariff rate and custom revenue share among total government revenue in India (%). *Source* Tariff rate data from Mitchell (1995). Custom revenue and total revenue data from same sources with Fig. 8.5. *Note 1* Tariff rate is estimated by custom revenue divided by total imports

8.5 Sluggish Technical Transfer Hypothesis

In addition to the two hypotheses mentioned above, there is another hypothesis to explain colonial India's stagnated industrialisation, which has mainly been proposed by Japanese economists, such as Kiyokawa (1976a, b, 1983) and Otsuka et al. (1988). Examining the rapid withdrawal of Indian cotton mills from the international market in the early 20th century, the studies argue that factors affecting technology choice had a profound influence on the stagnated growth of the Indian cotton mill industry, which was a representative industry of colonial India. They argue that the underlying factors include India's institutional and organisational challenges that go beyond factor endowment or colonial government *laissez-faire* based economic policies.

The cotton mill industry led industrial development in both India and Japan in the initial phase of their industrialisation. In India, the first steam-powered cotton mill was founded near Calcutta in 1817/18 by an Englishman, although the foreign capital-led attempt failed to achieve steady growth. The first successful attempt was made in the 1850s in Bombay by C.N. Davar, a wealthy Parsee merchant and his associates. The cotton milling business grew steadily throughout the second half of the 19th century, particularly from the 1870s, achieving high international competitiveness by the end of the 19th century. The success can be observed in the drastic rise in India's coarse yarn export to China. Indian export of coarse yarn grew rapidly from 6 million lbs in 1876 to 18 million lbs in 1878, 141 million lbs in 1894, and to 254 million lbs in 1899. Considering that the 1899 figure amounted to almost five times the Indian finer-count yarn import from the UK, Kiyokawa comments that the miraculous growth deserves more academic attention (Kiyokawa 1976a). However,

the miraculous growth in the Chinese market suddenly came to an end in the early 20th century. Export to China plummeted from 243 million lbs in 1905 to 172 million lbs in 1910 and 87 million lbs in 1913 (*ibid.*, p. 238).

Japanese cotton mills supplied coarse yarn to China from the 1910s, replacing Indian export. While the first modern cotton mill was founded in Japan in 1867 under the leadership of the Satsuma-*han*, one of the most powerful feudal lords under the Tokugawa shogunate, it was only after the 1880s that Japanese cotton mill industries started to show the signs of success. Under the leadership of Eiichi Shibusawa, known as the ‘father of Japanese capitalism’, Japanese cotton mills grew rapidly and steadily to form one of the foundations of Japan’s industrial development by the end of the 19th century. Otsuka et al. (1988) indicates that Japanese yarn exports to China and Hong Kong increased from 15.3 million lbs in 1895 to 102.4 million lbs in 1910 and to 170.3 million lbs in 1915. Japanese coarse yarn found its market even in India after the 1910s. Otsuka et al. (1988) shows that Japanese yarn exports to India increased from null in 1905 to 1.4 million lbs in 1915, 13.7 million lbs in 1920, and 26.0 million lbs in 1925. The divergence in the development of the cotton mill industry in India and Japan continued further after the early 1920s. India’s cotton mill industry confined its outlet to the domestic market, while Japan extended its reach to countries in East, Southeast, and South Asia.

According to Kiyokawa and Otsuka et al., a salient factor that differentiated the developmental pattern of cotton mill industries in the two countries was their attitudes towards technological adaptation and innovation in the spindle section. Spindle section, which forms the final process of yarn production, occupies more than 30% of the cotton mill’s entire production facility. Hence, Kiyokawa writes, ‘technical progress in spinning frames has a crucial effect, and even a slight improvement in them leads to a great increase in productivity as a whole’ (Kiyokawa 1983).

As explained by Kiyokawa (1976a, b, 1983) and Otsuka et al. (1988), cotton mill industries in India and Japan had two types of spindles, mule and ring spindles. Mule spindles could produce high quality yarn and had long been used in the UK due to its strong preference for high quality yarn. On the other hand, ring spindles could produce coarse yarn that was dominantly consumed in both countries for a long time. In the initial phase of cotton yarn production before the 1870s, mule spindles dominated yarn production in both countries as they both imported spindles from the UK. However, over time, ring spindles replaced mule spindles due to cost efficiency in both the Asian countries where capital was scarce and labour abundant in comparison to the factor endowment structure in the UK. Otsuka et al. summarises the advantage of ring spindles as follows, ‘The ring machinery had a clear advantage over mules in requiring less skilled labour. Moreover, by adding workers to tie the broken yarn, rings could be run at higher speeds. Consequently, for any given yarn count up to at least the 40s rings are much more labour-intensive than mules’ (Otsuka et al. 1988).

Despite the advantage of ring spindles over mule spindles, Indian cotton mills were slow in making the transition. The slow transition is apparent in comparison to the speedy diffusion of ring spindles in Japan, as shown in Figs. 8.11 and 8.12. Ring spindles started being used by the 1880s in both countries. However, it was only

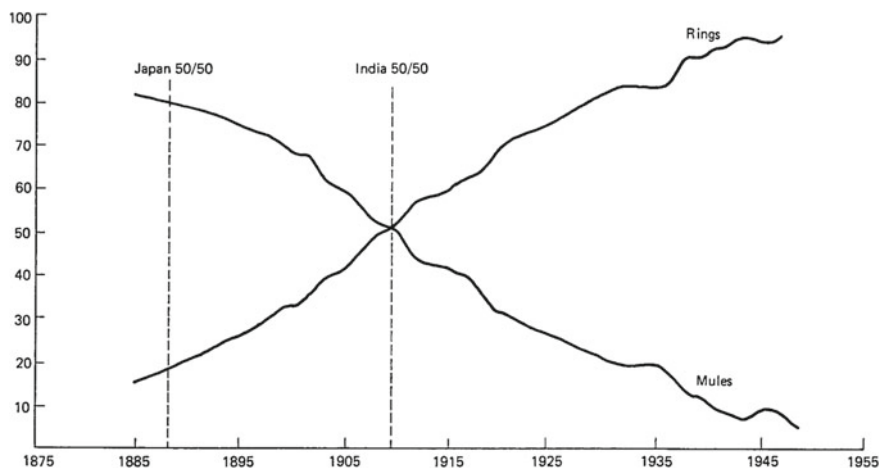


Fig. 8.11 Percentage of rings and mules: India. *Source* Otsuka et al. (1988, p. 9)

after the late 1930s when ring spindles dominated more than 90% of Indian mills. It took 20 years to reach a point where 50% of the spindles were replaced in India. Surprisingly, there were even cases of new installation of mule spindles in the early 20th century when the advantage of ring spindles over mule spindles was obvious. In Japan, as Fig. 8.12 indicates, the 50% replacement mark was reached as early as at the end of the 1880s, only a few years after replacement attempts began in the mid-1880s. Furthermore, more than 90% of mule spindles were replaced by ring spindles by the end of the 19th century. According to Otsuka et al. (1988), the speedy diffusion of the ring spindles in Japan explains 55–80% of total factor productivity growth of Japanese cotton mills in the 1890s, when its cotton mill industry experienced magnificent growth that formed the foundation for booming export to China in the 1900s.⁵

What explains the slow transition in colonial India? Both Kiyokawa (1976a, b, 1983) and Otsuka et al. (1988) focus on organisational and institutional factors to explain the cause. By examining the cotton mill's depreciation allowance policy, Kiyokawa (1976a, b) clarifies that India's slow transition was due to the poor depreciation allowance policy adopted by its myopic management. In his work in 1983, Kiyokawa also focuses on the continuing installation of mule spindles in the early 20th century as a sign indicating another salient feature of slow transition in India. Based on a rigorous statistical analysis, Kiyokawa shows that 'the high Mule ratio reflected the joint presence of foreign (British) staff in both top and middle managements supported by the mediating function of a foreign manager' (Kiyokawa 1983). Kiyokawa concludes by stating that, 'This analysis confirms the important role of

⁵Otsuka (1995) also clarifies that capital-output ratio (spindle/ton) of Indian cotton mills came to be more than double in comparison to Japanese mills by 1900, while there was much less differences between the ratios in the two countries around the 1890s.

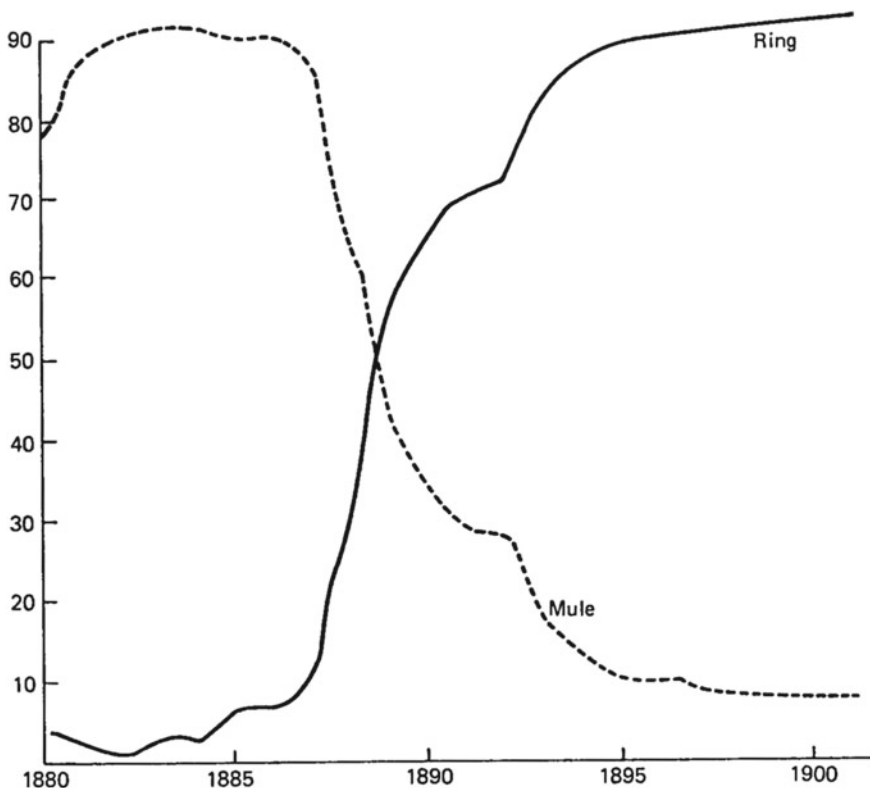


Fig. 8.12 Percentage of rings and mules: Japan. Source Otsuka et al. (1988, p. 10)

foreign technicians in the decision-making on choice of technique ...they (British technicians) were generally inclined to stick with old but familiar technology based upon their experience in Great Britain... In short, technological adaptation in India was greatly influenced by the British experience and by British patterns of technological development (ibid.)'. Kiyokawa also referred to India's slow development in technical education as a factor in the heavy reliance on British technical experts. He added, 'While it cannot be denied that the government was not especially eager to advance technical education in India, the Indian top management class has to share the responsibility as well for not having promoted technical education in real earnest by encouraging a more open and meritocratic society in the industrial world' (ibid.).

Otsuka et al. (1988) sheds light on the different aspects of India's institutional and organisational specificities to explain the slow transition. Initially, they argued that prices, such as factor prices and domestic prices under tariff protection, influenced the speed of technical diffusion. For instance, they mentioned that 'The price distortions commonly observed in developing countries are likely to result in both "inappropriate" choices of technology and an "inappropriate" direction for

technology change' (Otsuka et al. 1988). However, they assert that rigorous statistical examination 'permit us, moreover, to proceed beyond the simple factor price distortion story in explaining comparative technological performance'. After pointing out the importance of Japan's innovative activities in fields such as cotton mixing procedures for the efficient adaptation of ring spindles to the lower average staple length, they point out that 'the choices made by an individual Japanese entrepreneur [of cotton mills], in contrast to his Indian counterpart, illuminate the importance of differences in institutional and organisational environments (ibid.)'. In terms of the institutional and organisational environment in Japan, they focus on the existence of competitive pressure in the domestic market influenced by business associations, the availability of 'formal education and learning by opportunity', and 'the legal convenience of a petty patent system' (ibid.), none of which sufficiently existed in India.

Overall, Kiyokawa (1976a, b, 1983) and Otsuka et al. (1988) focus on the influence of institutional and organisation factors that were established both by private and public initiatives to explain the divergence of cotton mill industries in India and Japan, which were leading sectors of modern industrial growth in both countries.

8.6 Conclusions

After surveying the stagnated industrialisation nature of colonial India, this chapter reviewed three hypotheses to explain this phenomenon: the factor endowment hypothesis; the laissez-faire economic policy hypothesis; and the sluggish technical transfer hypothesis. In the review, we also briefly examined the first two hypotheses using historical data compiled by recent scholars. This chapter reveals that the factor endowment hypothesis needs to be supplemented by further investigations, while the laissez-faire economic policy hypothesis requires further analysis on how laissez-faire policies negatively affected India's industrialisation. Augmenting the two hypotheses may require further analysis, for instance, on the effects of fiscal stringency under laissez-faire policies on India's institutional and organisational development for mass and vocational education, patent system, or industrial financing system as it could have affected the performance of industrial enterprises through raising efficiency in labour or capital transactions. Further clarification on India's institutional and organisation development, on which Kiyokawa (1976a, b, 1983) and Otsuka et al. (1988) strongly focused, would help us deepen our understanding on factors underlying the stagnated nature of industrialisation in colonial India. However, this is an agenda for future work.

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