THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Economic History Working Papers No: 389

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November 2025

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Upgrading Traditional Industries in Interwar Japan: From cotton *tabi* to Bridgestone Tyres[*°]

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Keywords: industrialisation, technology transfer, Japanese economic history, rubber, industrial clusters, indigenous industries, business history
JEL Codes: L62, L65, N15, N75, N85, N95, O14

Abstract
This paper contributes to our understanding of how Japan became the only Asian country to achieve sustained catch-up industrialisation before WWII. It does so by analysing the absorption of useful foreign knowledge in a traditional Japanese textile town and its subsequent evolution into a modern rubber manufacturing cluster. The cluster analysed is Kurume in Fukuoka Prefecture which began the interwar period as a major producer of cotton *tabi* (split-toed footwear). The core argument is that Kurume firms Nihon Tabi and Tsuchiya Tabi built on their foundations as large sewing factories by 'borrowing capacity' from general trading companies. This enabled them to evolve into large-scale rubber-soled footwear manufacturers capable of absorbing high-level engineering knowledge necessary to compete with Dunlop and US tyre-makers in Asian motor tyre markets. A rich body of new primary material ranging from the corporate archives of Mitsui Bussan and Mitsubishi Shōji to regional industrial surveys is analysed using a novel conceptual framework. This framework draws upon Klepper's (2010) heritage theory which suggests that best-practice industry knowledge is diffused out of leading firms. Integrated into this approach is Abe & Nakamura's (2010) suggestion that the 'indigenous industrialization process' in Japan identified by Tanimoto (2006) was not separate from, but interacted with, the diffusion of Western-style manufacturing.

[*] Thanks to my supervisors Janet Hunter and Gerben Bakker and my GRC readers Patrick Wallis and Jason Lennard for comments and advice on this paper which is based on a chapter of my PhD monograph at LSE. Thanks also to Naofumi Nakamura for research advice directly connected to this paper and for hosting me at the University of Tokyo while I was collecting relevant primary material in Japan, and to Takafumi Kurosawa for his support during the genesis of this research at Kyoto University. I am grateful for the comments and feedback received when presenting this paper at the EBHA Annual Congress and World Economic History Congress (WEHC) 2025 in the session organised by Adoración Álvaro-Moya, Pierre-Yves Donzé and Santiago M. Lopez. I would also like to thank Hisayuki Oshima, Tomoko Hashino, Serguey Braguinsky, Sumner La Croix and Kent Deng for helping shape the direction of this paper. The research on which this paper is based is supported by an ESRC PhD Studentship and a Great Britain Sasakawa Foundation Studentship.
[°] An edited version of this paper will appear in Adoración Álvaro-Moya, Pierre-Yves Donzé and Santiago M. Lopez eds., *Technology Transfer and Catching-Up in Late Industrializing Countries: The Role of Labour Force Education and Training* (2026).

1. Introduction

This paper seeks to improve understanding of both the mechanisms behind catch-up industrialisation and the upgrading of industrial clusters through knowledge transfer. It draws on Gerschenkron's notion that the engine of late industrialisation is knowledge and technology transfer from more advanced economies. Under Gerschenkron's framework, missing prerequisites vis-à-vis early industrialisers can be compensated for by new institutional and organisational instruments that differ according to a country's relative 'backwardness'. Gerschenkron also acknowledged that the development of modern industry in latecomer countries appeared in combination with 'indigenously determined elements' and emphasised the significance of 'native elements' in late development.[1] At the heart of catch-up industrialisation is the absorption and adaption of what Mokyr terms 'Western useful knowledge' – defined as prescriptive knowledge rooted in propositional knowledge.[2] A key carrier of such knowledge is the firm which can be conceptualised as a bundle of codified and tacit knowledge. Saviotti describes the collective knowledge used by a firm for productive purposes as its 'knowledge base'. Firms have greater capacity to absorb new external knowledge when it is similar to their 'pre-existing internal knowledge'.[3] Mokyr suggests that the new technology of the British industrial revolution expanded the knowledge base needed for production and therefore increased the size of firms and gave birth to the factory.[4] This suggests that large firms with sufficient knowledge bases are required for the absorption of certain new technologies by developing countries.

This paper analyses the absorption of useful foreign knowledge in an indigenous Japanese textile cluster and its subsequent evolution into a modern rubber manufacturing cluster. The core argument is that Nihon Tabi and Tsuchiya Tabi's

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[1] Alexander Gerschenkron, *Economic Backwardness in Historical Perspective: A Book of Essays* (Cambridge MA: Harvard University Press, 1962 [Ch. 1 first printed in 1952]).
[2] Joel Mokyr, *The Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton: Princeton University Press, 2002), pp. 4 & 333.
[3] Paolo Saviotti, *Technological Evolution, Variety, and the Economy* (Cheltenham: Edward Elgar, 1996), p. 172; Paolo Saviotti, 'On the Dynamics of Appropriability, of Tacit and of Codified Knowledge', *Research Policy* 26 (1998), pp. 843-856 (p. 845).
[4] Mokyr, *Gifts of Athena*, p. 154.

foundations as large factories in the cotton *tabi* industry combined with the relationship they cultivated with the two largest general trading companies (*sōgō shōsha*), created a rubber footwear manufacturer capable of absorbing the high-level engineering knowledge necessary to compete with Dunlop and BF Goodrich in the domestic automobile tyre market. Motor tyre production required a much larger knowledge base than bicycle or rickshaw tyre production where small firms could succeed. This study draws extensively on a rich body of new primary evidence including archival material from Mitsui Bussan and Mitsubishi Shōji and published primary material such as local manufacturing surveys to examine how the provincial textile town of Kurume in Fukuoka Prefecture created in Bridgestone the only Asian firm able to compete with Western multinationals in the motor tyre industry in this period. Attempts were also made to utilise the corporate archives of the three key rubber firms analysed in this study. However, such material proved inaccessible.[5] The methodology employed is a bottom-up analysis based on the discovery of new material. This new evidence is woven together with appropriate theory to provide a narrative of best fit.

By the 1910s, Kurume's cotton *tabi* industry had already evolved from what Nakamura Takafusa would term an 'old indigenous industry' into a 'new indigenous industry' using limited resources and technology from abroad.[6] In the 1920s and 30s, it transformed into a large-scale factory industry dominated by big business in line with Nakamura Naofumi & Abe Takeshi's suggestion that Japan's two development paths – traditional manufacturing and modern factory-style manufacturing – were often complementary.[7] This theoretical framing contrasts

[5] For more detail on attempts to access these archives, see Tom Learmouth, 'The Trials and Tribulations of Accessing Corporate Archives in Japan', *Shashi: The Journal of Japanese Business and Company History* 8 (2024).
[6] Nakamura Takafusa, *Meiji-Taishō-ki no Keizai* [The Meiji-Taisho Period Economy] (Tokyo: University of Tokyo Press, 1985) [in Japanese], pp. 177-180.
[7] Abe Takeshi and Nakamura Naofumi, 'Nihon no Sangyō Kakumei to Kigyō-keiei' [Japan's Industrial Revolution and Business Administration] in Abe Takeshi and Naofumi Nakamura eds., *Nihon Keiei-shi 2 Sangyō Kakumei to Kigyō-keiei 1882-1914* [Business History of Japan 2: Industrial Revolution and Business Administration] (Kyoto: Minerva Shobo, 2010) [in Japanese]; Nakamura Naofumi, 'Reconsidering the Japanese Industrial Revolution: Local Entrepreneurs in the Cotton Textile Industry during the Meiji Era', *Social Science Japan Journal* 18 (2015), pp. 23-44.

with Tanimoto's thesis that traditional industries provided Japan with an alternative indigenous industrialisation path separate to the development of modern industry based on Western technology.[8] Nakamura & Abe's framework aligns in some ways with Boschma & Wenting's analysis of the concentration of the British automobile industry in Coventry. Boschma & Wenting suggest that what we could call 'indigenous' bicycle making in Coventry laid the foundation for the city to become the centre of the British car industry. The bicycle industry acted as the foundation for a new industrial cluster to emerge based on spin-offs from successful early entrants in the automobile industry.[9]

This spin-off mechanism is associated with evolutionary economist Steven Klepper's heritage theory, which is another key conceptual basis on this paper. Klepper focuses on the spread of tacit knowledge from leading firms in the historical emergence of industrial clusters.[10] For example, Buenstorf & Klepper attribute the growth of the rubber industry in Akron, Ohio, to BF Goodrich and three other leading firms with connections to the pioneering tyre-maker: Goodyear, Firestone, and Diamond. Using statistical hazard analysis, they suggest that the growth of this cluster represents 'an endogenous process in which incumbent firms involuntarily spawn spinoffs', where better firms spawn more and better spinoffs.[11] This contrasts with the mainstream approach to agglomerations attributing their existence to static external economies, in line with the classic Marshall thesis.[12] In this study, Dunlop Far East in Kobe – a subsidiary of Britain's top tyre-maker – was the key source of high-level tacit knowledge on which the evolution of Kurume from a textile cluster into a rubber cluster depended.

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[8] Tanimoto Masayuki, 'The Role of Tradition in Japan's Industrialization: Another Path to Industrialization', in Tanimoto Masayuki ed., *The Role of Tradition in Japan's Industrialization: Another Path to Industrialization* (Oxford: Oxford University Press, 2006).
[9] Ron A. Boschma and Rik Wenting, 'The Spatial Evolution of the British Automobile Industry: Does Location Matter?', *Industrial and Corporate Change* 16 (2007), pp. 213–238.
[10] Steven Klepper, 'The Origin and Growth of Industry Clusters: The Making of Silicon Valley and Detroit', *Journal of Urban Economics* 67 (2010), pp. 15-32.
[11] Guido Buenstorf and Steven Klepper, 'Heritage and Agglomeration: The Akron Tyre Cluster Revisited', *Economic Journal* 119 (2009), pp. 705–733.
[12] Alfred Marshall, *Principles of Economics* (London: Macmillan, 1920).

Rubber manufacturing in Kurume was seeded by Dunlop Far East when Tsuchiya Tabi signed an agreement with the British firm in 1920 to research cementing a rubber sole onto its cotton *tabi*. By the late-1920s, domestic and early export success had created in Tsuchiya and Nihon two giant rubber-soled footwear firms in Kurume with sophisticated organisational structures and links to Japan's two largest general trading companies, Mitsui Bussan and Mitsubishi Shōji. When Nihon Tabi established an auto tyre division in 1929, they were able to reproduce the technological competence of Dunlop, the Klepper-style leading firm in Japan. Knowledge from the more technologically advanced motor tyre industry was absorbed by hiring three senior Dunlop Far East engineers and by drawing on formal engineering and chemistry knowledge, such as that of Kimijima at Kyushu Imperial University. Kurume rival Tsuchiya Tabi may have been able to do the same with Goodyear rather than Dunlop heredity, but the Akron firm declined Tsuchiya and Mitsubishi's proposal for a joint auto tyre venture. Echoing the key ingredients emphasised in Braguinsky's adaption of Klepper's framework to the Japanese cotton spinning industry, Bridgestone were able to challenge Dunlop and US tyre-makers in Asian auto tyre markets in the 1930s by marrying Mitsui-connected management expertise inherited from the *tabi* industry with high-level engineering expertise.[13] This period also saw the first links with the Akron tyre cluster, opening up a new pipeline of tyre manufacturing heritage to Kurume beyond Dunlop which would become the key dynamic of the post-war era.

A final important conceptual argument in this section is the role of diversified trading companies in driving industry evolution. To draw again on Gerschenkron's framework, Mitsui Bussan and Mitsubishi Shōji acted as the institutional and organisational instruments lifting Kurume's *tabi* makers onto an international big business trajectory.[14] In his study of entrepreneurship in Japan's cotton spinning industry in the late nineteenth century, Choi similarly identified Mitsui Bussan as a critical Gerschenkronian 'non-market institution' reducing information costs

[13] Serguey Braguinsky, 'Knowledge Diffusion and Industry Growth: The Case of Japan's early Cotton Spinning Industry', *Industrial and Corporate Change* 24 (2015), pp. 769–790.
[14] Gerschenkron, *Economic Backwardness*, p. 26.

for Japanese cotton spinners engaging in international trade, though his focus is also on Mitsui's role in facilitating technology transfer to Japan.[15] This also ties into broader conceptual considerations of the role of diversified trading companies in providing other economic actors with organisational capacity. In arguing that the British state borrowed administrative capacity from the English East India Company (EIC) in the eighteenth century, Hutková et al emphasise the potential contribution of trading companies to expanding the fiscal and administrative capacity of an emerging state. Possessing 'informational advantages, calculative capacities, management, and human capital' superior to the British customs office, the EIC is seen to have helped the British state 'escape from a low-capacity trap' by collecting revenue on their behalf.[16] This 'borrowed capacity' framework can also be applied beyond the building of state capacity to the building of capacity at emerging manufacturing firms. In the case of early twentieth century Japan, many indigenous manufacturers borrowed capacity from large trading companies – Mitsui Bussan and its *zaibatsu* parent in particular – to engage directly in international business. In interwar Kurume, the process of bringing the large *tabi* makers up to the level of modern management proceeded more smoothly between Nihon and Mitsui than between Tsuchiya and Mitsubishi Shōji.

While the state is also often a key Gerschenkronian instrument for catch-up growth, state support for industry in pre-war Japan was generally indirect until a move towards interventionism began in the 1930s. The key measures of relevance here are the provision of formal engineering education and modest tariff protection for motor tyre manufacturing. While a distinct actor, the powerful Mitsui *zaibatsu* also had important linkages to the state, including ties to the *Seiyūkai* political party. Tariffs are what had induced British trading house H. & W. Greer to establish a factory for Britian's Dunlop in Kobe in 1909.[17] Japan was viewed as an

[15] Eugene Choi, 'Entrepreneurial Leadership in the Meiji Cotton Spinners' Early Conceptualisation of Global Competition', *Business History* 51 (2009), pp. 927–958 (pp. 931-932).
[16] Karolina Hutková, Ernesto Dal Bó, Lukas Leucht, and Noam Yuchtman, 'Company-State at Home: The East India Company and the Fiscal System in Eighteenth-Century Britain', *Past & Present* (2025): gtaf009.
[17] For H. & W. Greer's role in bringing rubber and bicycle manufacturing to Japan see Tom Learmouth, 'British Trading Companies and Tacit Knowledge Seeding: Diversifying Japanese Industrialisation, 1906–1918', *forthcoming*; Geoffrey Jones, 'The Growth and Performance of

emerging market for bicycle and rickshaw tyres and – after the signing of the Anglo-Japanese Alliance in 1902 – a potential base from which to export rubber goods to the rest of Asia.

This paper begins with an analysis of the emergence of the new rubber-soled *tabi* industry led by the two Kurume manufacturers. It then analyses the cultivation of a relationship between Nihon Tabi and Mitsui Bussan before discussing how this enabled Nihon to rapidly penetrate markets across the globe with rubber-soled canvas shoes and move decisively onto a big business trajectory. The fourth section discusses how this trajectory led to the emergence of a Japanese challenger to Dunlop in the automobile tyre industry in the form of Nihon Tabi's Bridgestone, including how technical knowledge was rapidly acquired through the hiring of Dunlop Far East employees. The final substantive section analyses Bridgestone's ability to rapidly gain domestic market share in competition with Dunlop and Goodrich, as well as its penetration into export markets in alliance with Mitsui. Section six concludes.

2. Cotton *Tabi* Manufactures become Rubber Manufacturers

By the end of the First World War, Kurume harboured in Tsuchiya Tabi and Nihon Tabi two of the three large-scale cotton *tabi* firms in Japan (the other was Fukusuke Tabi in Osaka). The shift into mechanised and integrated production had been led by Tsuchiya who became the first *tabi* shop to utilise sewing machines in 1894. Depending on the rival *tabi* producing regions of Osaka and Saitama for thick cotton cloth suitable for *tabi*, Tsuchiya decided to backwardly integrate by opening a weaving factory in 1907. This put Tsuchiya – and follower firm Nihon Tabi led by Ishibashi Shōjirō – on a path of mechanised factory production akin to Kurume's cotton spinning and *kasuri* cloth industries which had mechanised towards the end of the Meiji period (1868-1912).[18] Meanwhile, the

British Multinational Firms before 1939: The Case of Dunlop', *Economic History Review* 37 (1984), pp. 35-53.

[18] Nakamura Naofumi, 'Reconsidering the Japanese Industrial Revolution'.

rapid emergence of vulcanised rubber footwear production in western Kobe from 1918 could not have gone unnoticed in Kurume. Nor could the trend in Osaka of *tabi* producers stitching onto *tabi* rubber soles purchased from rubber manufacturers. Thus, a shift into rubber-soled *tabi* production in Kurume – to turn indoor footwear into outdoor footwear – was not an idea which needed much inspiration. The challenge was to create a pair of *jika tabi* that were durable enough to displace the far cheaper *waraji* (straw sandals) as the preferred form of footwear for miners and outdoor labourers. To do so, there were two options. One was to improve the dominant method of stitching rubber soles onto cotton *tabi* so that they would not detach so easily. The other was to cement the soft rubber compound onto *tabi* and then vulcanise the whole shoe without destroying the cotton fabric. The latter required vertical integration into rubber manufacturing.

In 1920, Tsuchiya succeeded in signing a special agreement with Dunlop Far East's head engineer George Murphy to conduct research into cemented rubber soles onto *tabi* and dispatched their engineer Nagata Kunisuke to Dunlop's Kobe factory.[19] It is worth noting that the official narrative is simply that Tsuchiya and Nihon Tabi began producing and selling Japan's first *jika tabi* at almost exactly the same time. In reality, the first cemented *jika tabi* had been patented in Osaka. Tsuchiya was the first mover in Kurume in asking Dunlop to begin researching the cementing method. However, before Tsuchiya and Dunlop's *jika tabi* was ready for commercial production, Nihon Tabi hired Mori Tetsunosuke from Kakuichi Rubber in Osaka and purchased from Yamauchi Suezō the patent for a cemented *jika tabi* which Mori himself had helped develop. Mori then led the development of the Asahi Jika Tabi which was registered by Nihon as a sub-patent in 1923. Nihon appears to have then used that patent to temporarily block Tsuchiya from manufacturing and selling the *jika tabi* Dunlop had developed for them.

Armed with the Asahi Jika Tabi patent, Nihon made a more decisive shift into rubber manufacturing than Tsuchiya. By 1926, the *tabi* industry was generating

[19] Tsukihoshi Gomu, *Tsukihoshi Gomu 90-nen Shi: Meiji 6-nen Sōgyō* [Moonstar Rubber 90-year History] (Kurume: Tsukihoshi Gomu, 1967), p. 69.

just over 52 per cent of Kurume's entire goods output (including agriculture) of 33.8 million yen. Almost half of Kurume's manufacturing workforce were directly employed in the *tabi* industry, which consisted of just two firms. As with other textile firms in Japan, most of this workforce was female. By this time, Nihon had embraced the modern factory system to a greater extent than Tsuchiya. Nihon consumed far more coal and electricity and employed far more horsepower per worker. Nihon's paid-in capital of two million yen was also quadruple Tsuchiya's 500,000 yen.[20]

Just as striking is that Tsuchiya remained far more tied to the old cotton *tabi* than Nihon, who had been faster to sever links with the traditional industry. As table 1 shows, fully cotton *tabi* still made up the bulk of Tsuchiya's output in values terms, and even more so in quantity terms. By contrast, Nihon had their *tabi*-clad feet planted firmly in the rubber industry.

Table 1. Output of Nihon Tabi and Tsuchiya Tabi in 1926

	Cotton Tabi			Rubber-Soled Tabi & Other Footwear		
	Pairs	Values (Yen)	Yen per Pair	Pairs	Values (Yen)	Yen per Pair
Nihon Tabi	1,496,011	394,494	0.26	8,564,746	7,551,391	0.88
Tsuchiya Tabi	9,606,410	5,772,150	0.60	3,321,570	4,024,960	1.21

Source: Compiled from *Kurume-Shi Kangyō Yōran: Shōwa 3-nen*, p. 6.

The table also reveals that Tsuchiya's *tabi* were far more expensive than those of Nihon and thus catered to a somewhat different market. Tsuchiya's cotton *tabi* were worth more than double those of Nihon, where nominal prices had not increased much since the 20 *sen Asahi Tabi* campaign of 1914. In addition, Tsuchiya's Dunlop-designed *jika tabi* had a 38 per cent price premium over Nihon's *Asahi Jika Tabi*. Tsuchiya thus marketed themselves as a manufacturer of a premium product. By contrast, Nihon was focused squarely on the mass market.

[20] *Kurume-Shi Kangyō Yōran: Shōwa 3-nen* (Kurume City Hall, 1927).

3. Mitsui & Mitsubishi Coordinate Penetration of Export Markets

As Nihon moved ahead of Tsuchiya in the new *jika tabi* market, Nihon's Ishibashi family were cultivating a crucial relationship with their raw rubber supplier Mitsui Bussan, Japan's premier pre-war general trading company and a key pillar of the powerful Mitsui *zaibatsu*. Using rich new archival material, this section provides the first analysis of how this Mitsui connection was formed and how it evolved to generate huge global sales for Nihon. From the late-1920s, 'borrowed capacity' from Mitsui Bussan would become central to Nihon Tabi's transformation into a globally competitive manufacturing firm.[21]

Nihon Tabi's connections to Mitsui came through Noda Utarō who acted as advisor to the Ishibashi family.[22] A cabinet minister, Noda was a close ally of Mitsui and had close connections to Dan Takuma, who became director-general of the whole Mitsui *zaibatsu* in 1914.[23] Through these links to Mitsui, Nihon chiefly relied on Mitsui Bussan's branch in Moji (Kyushu's main port) to sate their growing appetite for raw rubber. Mitsui Bussan began supplying Nihon with raw rubber in 1923, and Tsuchiya in 1925.[24]

[21] Hutková, Dal Bó, Leucht, and Yuchtman, 'Company-State at Home'.
[22] Mitsui Bussan. *Kyū Mitsui Bussan Shiten-chō Kaigi Gijiroku* 16, Shōwa 6-nen (1931). Miike Shiten-chō, p. 144. <<elib.maruzen.co.jp>>
[23] John G. Roberts, *Mitsui: Three Centuries of Japanese Business* (New York: Weatherhill, 1973), pp. 132-135.
[24] Mitsui Bunko (Mitsui Archives), Tokyo. Bussan Chōsa 256-6. *Moji Shiten*. June 1926.

Figure 1. Mitsui Bussan's Rubber Godown in Singapore, 1926

Source: Mitsui Bussan. Bussan Chōsa 413-6. *Rubber Godown of M. B. K. Singapore*. 22nd November 1926.

Around the same time shipments to Moji began, Mitsui also began exporting raw rubber from Singapore to New York for the US tyre-makers in Akron.[25] In February 1926, Mitsui Bussan's New York branch opened a rubber trading facility to hedge buying and selling large quantities of raw rubber for the Akron manufacturers.[26] As Ueyama has shown, Mitsui's New York office rapidly increased its share of raw rubber imports into the US from 1.6 per cent in 1927 to 9.6 per cent in 1930.[27]

To build on the early success of *jika tabi* across Japan, Nihon and Tsuchiya soon began to look towards the rest of Asia, where small-scale rubber shoemakers in Kobe were beginning to find export success. The split-toed *tabi* lasts could easily be adapted into lasts shaped for rubber-soled canvas shoes suitable for the export market. Tsuchiya began producing such canvas shoes in 1925.[28] Lacking knowledge of foreign markets and a sales network through which to sell their products overseas, the vast overseas networks of their raw rubber suppliers Mitsui

[25] Bussan Chōsa 251-11. *Gomu Seisan Jijō Hōkoku-Sho, Kōbe Shiten*. 8th June 1926.
[26] Mitsui Bunko. Mitsui Bussan 2036. *Torishimariyaku Kaiketsu Giroku*. 8th June 1926.
[27] Ueyama Kazuo, *Hokubei ni okeru Sōgō Shōsha no Katsudō: 1896–1941-nen no Mitsui Bussan* (Tokyo: Nihon Keizai Hyōronsha, 2005), p. 336.
[28] Moonstar Website. <<https://www.moonstar.co.jp/history/>>

Bussan and Mitsubishi Shōji provided Nihon and Tsuchiya with a sophisticated export infrastructure to tap into.

Tsuchiya began exporting rubber footwear through Mitsui and Mitsubishi in 1926.[29] The same year, Mitsui's Moji branch voiced its concern over the hosting of some Nihon Tabi employees at Mitsubishi Shōji's Singapore branch.[30] Nihon opened up a dedicated export department in May 1927 and officially began selling their products abroad through Mitsui Bussan in September 1927.[31] In July 1928, Nihon Tabi formalised the alliance by signing an exclusive sales contract with Mitsui Bussan across Asian export markets which included China, French Indochina, the Straits Settlements, and British India. For the duration of the contract, Mitsui were forbidden from selling Tsuchiya Tabi and Fukusuke Tabi products in those regions.[32] Locked out of Mitsui Bussan's vast sales network, in April 1929 Tsuchiya signed an exclusive sales contract across all export markets with their other raw rubber supplier, Mitsubishi Shōji. In announcing the contract to Mitsubishi's overseas offices, Mitsubishi's General Merchandise (*Zakka*) department chief Suzuki Kiyoshige explained that Tsuchiya wanted to entrust their overseas business to Mitsubishi in response to Mitsui successfully opening up new foreign sales channels for Nihon Tabi products.[33] Tsuchiya were thus now the follower firm in trying to replicate the strategy behind their rival's early export success. From Mitsubishi's perspective, it also diversified their rubber goods business beyond Goodyear products.

To support their overseas expansion in alliance with Mitsui, Nihon set about building a new factory in nearby Fukuoka City specialising in rubber-soled canvas shoes in 1928.[34] The Kurume factory remained specialised in *jika tabi* and thus

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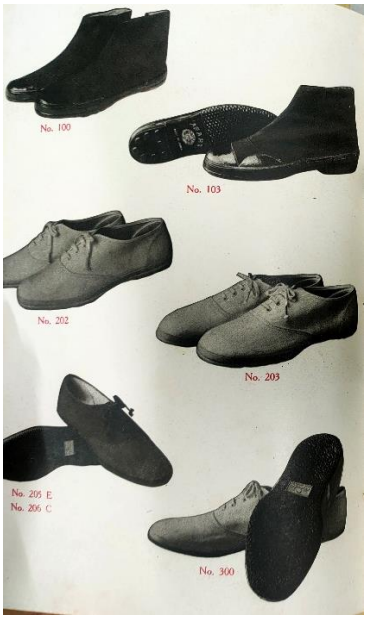
[29] *Tsuchiya Tabi Enkaku-shi Showa 2* (Kurume: Tsuchiya Tabi, 1927), p. 38.
[30] Bussan Chōsa 256-6. *Moji Shiten*. June 1926.
[31] Bridgestone Corporation, *Burijisuton 75 Nen-shi* [Bridgestone 75 Year History], (Tokyo: Bridgestone Corporation, 2008), p. 20.
[32] Mitsui Bussan 2382. *Kaigi Tsuzuri*, 10th July 1928.
[33] *Seized Correspondence of the General Merchandise Department of Mitsubishi Shoji Kaisha Ltd of Seattle* (NAID: 6773703), Box 74, Japanese Rubber Shoes – Tsuchiya Tabi Gomei Kaisha (1930). U.S. National Archives and Records Administration (NARA), Archives II College Park.
[34] *Burijisuton*, p. 20.

continued to target the domestic market. Nihon and Tsuchiya could not compete with the small Kobe footwear makers on price as to do so might require doctoring their footwear with inferior materials which would tarnish the reputation of both firms. Instead, they had to create brands which evoked quality through foreign marketing efforts with their *sōgō shōsha* partners. Through their Asahi, Moonstar and Bat brands, Nihon and Tsuchiya tried to distance themselves from the cheap, often poor-quality shoes flooding out of the port of Kobe.[35] As figure 2 shows, both manufacturers provided their *shōsha* partners with English-language catalogues for foreign retailers.

Figure 2. Export Catalogues of Moonstar and Asahi Rubber-Soled Canvas Shoes in 1930s



Note: Page from Tsuchiya Tabi's Moonstar Export Catalogue in the early 1930s (left), page from Nihon Tabi's Asahi Export Catalogue in the late 1930s (right).
Sources: From Moonstar Website <<https://www.moonstar.co.jp/history/>> and *Asahi Export Catalogue* (Kurume: Nihon Rubber, Year Unknown).

From 1928, Kurume rubber-soled footwear made rapid inroads into export markets. Nihon Tabi employees were dispatched to and given a desk at Mitsui Bussan's overseas branches across China, a practice which was soon extended to

[35] Fujii Shigeru & Takitani Zenichi, 'Gomu Kōgyō' [Rubber Industry], in Japan Society for the Promotion of Science, Takitani Zenichi ed., *Yushutsu Zakka Kōgyō Ron: Jikyoku to Chūshō Kōgyō IV* (Tokyo: Yuhikaku, 1942), p. 63.

Mitsui's branches in India. The export-focused Fukuoka factory initially had 1,800 workers and was thus smaller than the 4,000-strong Kurume factory focused on the domestic market. However, the factory was expanded over the course of 1931 as part of plans to ramp up its workforce to 3,000.[36]

In 1930, Finance Minister Inoue Junnosuke singled out Nihon Tabi as a ray of hope during the severe downturn which followed the Great Depression and his own decision to lift the gold embargo in January that year.[37] Indeed, Kurume footwear's export boom predated the sharp depreciation in the yen in December 1931, after new Finance Minister Takahashi Korekiyo took Japan off the gold standard. Rubber footwear rapidly became a key pillar of support for Mitsui Bussan's Moji branch. Moji branch chief Hasegawa devoted almost all his attention to rubber footwear in the July 1931 summit between branch heads. Building on success in China, Mitsui had sold five million pairs of Asahi footwear in India over the previous twelve months, chiefly in and around Calcutta and Bombay. Mitsui expected to increase annual sales in India to ten million pairs as Nihon urged them to expand their sales channels of Asahi footwear to regional cities in India.[38]

Together with Kobe footwear, Kurume rubber-soled footwear swept world markets in the early 1930s.[39] As shown in table 2, Nihon Tabi's share of national exports had declined since 1928, when canvas shoe exports first took off, but still accounted for over a third of the Japanese total in 1931. Mitsui and Nihon thus maintained a clear lead in the export market over rival duo Mitsubishi and Tsuchiya, exporting around five times as many pairs of (albeit cheaper) shoes in 1931. The Nihon data also suggests that the five million pairs exported to India in 1931 accounted for around half of their total exports. By the 1930s, Kurume

[36] *Mitsui Bussan Shiten-chō Kaigi Gijiroku* 16. Moji Shiten-chō (1931), p. 32.
[37] *Burijisuton*, p. 21.
[38] *Mitsui Bussan Shiten-chō Kaigi Gijiroku* 16. Moji Shiten-chō (1931), p. 32.
[39] Nihon Tabi & Bridgestone, *Honpō ni okeru Gomu Kōgyō* [The Rubber Industry in Japan] (Kurume: Nihon Tabi, 1934), p. 3.

rubber-soled footwear had become one of the most important export items for the port of Moji along with cement, paper, rice and refined sugar.

Table 2. Exports of Rubber-Soled Canvas Shoes, 1928-1932 (Million Pairs)

	Nihon Tabi	Total Japan	Nihon Tabi Share (%)
1928	3.14	5.40	58.1
1929	5.04	13.90	36.3
1930	8.22	17.30	47.5
1931	10.07	28.00	36.0
1932	12.50	38.90	32.1

Source: Nihon Tabi & Bridgestone, *Honpō ni okeru Gomu Kōgyō*, pp. 64-65.

4. The Birth of Bridgestone

4.1 From Tabi to Tyres

The remainder of this paper analyses the emergence of Bridgestone in Kurume as the only Japanese rubber manufacturer to break into the oligopoly of Western multinationals which dominated the Asian motor tyre market in this period. It is suggested that Bridgestone's success was rooted in the ability of Nihon Tabi's Mitsui-connected management expertise to absorb engineers possessing high-level tacit knowledge from Dunlop Far East and codified chemistry knowledge from an imperial university education.

By the late 1920s, Nihon Tabi's vast size and profitability from both domestic and early foreign sales had provided Ishibashi Shōjirō with plenty of spare cash which could be used to fund new ventures. Japanese demand for automobile tyres began to increase rapidly in the 1920s, particularly following the establishment of Ford and GM assembly plants in the country. In 1928, Ishibashi noted that around 60 per cent of raw rubber in Western countries was absorbed by the automobile tyre industry and speculated that Japan's rubber industry might end up with a similar structure. Recognising the difficulties in competing with Dunlop and imported US tyres on quality, he set his sights on the possibility of manufacturing cheap automobile tyres. Shōjirō was reportedly warned against such a venture by his brother Tokujirō and by Nihon's former Kakuichi engineers Mori and Paul

Hirschberger who were aware of the technological challenge.[40] However, Nihon had accumulated crucial experience in large-scale production and had substantial funds to throw at the problem of bridging the sizeable technological gap between rubber-soled footwear and automobile tyres.

A crucial early backer of Ishibashi's plan to manufacture motor tyres was Kimijima Takeo, a professor of applied chemistry at Kyushu Imperial University. Kimijma had studied rubber manufacturing in Akron, Ohio, from the spring of 1918 until autumn 1919 where he made connections with leading rubber chemist Professor Hezzleton Simmons at the University of Akron and Goodrich vice president Raymond, who was involved in Goodrich's Yokohama Rubber venture. Using their networks, he was able to visit 25 rubber factories in the United States. In November 1920, Kimijima wrote up his insights from Akron in a detailed article on the US rubber manufacturing industry published in *Fukuoka Nichi Nichi*. While noting the huge differences in the scale of rubber factories between the US and Japan, Kimijima emphasised Akron's superior managerial and technological capabilities. He placed particular importance on the widespread use of organic accelerators in Akron to dramatically speed up the vulcanisation process, which were only used by a handful of factories in Japan at the time.

Despite considerable mechanisation over the previous decade, Kimijima suggested that the Akron rubber industry retained some characteristics of a 'handicraft industry'. The elasticity of rubber made the use of machines applying a fixed amount of pressure unsuitable for many parts of the manufacturing process which instead required skilled workers. Kimijima suggested that this dependence on labour as a production input gave low-wage countries such as Japan a potential competitive advantage.[41] Soon after publishing his article, Kimijima created a rubber research facility at Kyushu Imperial University equipped with rubber manufacturing machinery such as rollers and presses which opened in 1922. Over

[40] *Burijisuton*, pp. 30-31.
[41] *Fukuoka-Nichi Nichi Shimbun*, 23rd & 28th November 1920, pp. 158-159. Kobe University Newspaper Clippings Collection 113 <<https://hdl.handle.net/20.500.14094/0100083037>>

the next few years, Kimijima developed a relationship with Nihon Tabi through factory tours and job placements of graduates. In the summer of 1928, the Ishibashi brothers made the short trip from Kurume to Fukuoka City – home to Nihon's new canvas shoe factory – to present Kimijima with their idea of moving into motor tyre manufacturing. While warning them that tyre manufacturing technology was extremely complex and success far from guaranteed, Kimijima said he would assist the project provided they could commit one or two million yen in research expenses.[42] In March 1929, Nihon Tabi recruited Kimijima's student Kitajima Magoichi who had just graduated from Kyushu Imperial in applied chemistry. Kitajima was made head engineer of the speculative tyre venture, while Nihon's Paul Hirschberger (a former prisoner of war in Kurume) was put in charge of rubber compounding.[43]

In April 1929, Ishibashi Shōjirō told Mori and Hirschberger to secretly purchase equipment necessary for manufacturing 300 automobile tyres per day. The machinery cost 70,000 yen and was purchased from Akron Standard Mold through L. J. Healing & Co., the British trading company which two decades earlier had competed with H. & W. Greer in importing British bicycles into Japan.[44] The machinery arrived in January 1930 and included tyre moulds, tyre moulding machines and vertical vulcanisers.[45] It is perhaps surprising that Ishibashi did not use Mitsui Bussan which had developed connections with the Akron tyre industry as a major importer of raw rubber into the United States. In 1928, Mitsui Bussan had advised Ishibashi against moving into motor tyre manufacturing, warning that a new tyre brand could easily be wiped out if American tyre manufacturers protected their position in the Japanese market through dumping. But while Bussan were wary, Dan Takuma, who was by this time the director of the whole Mitsui *zaibatsu*, was firmly behind Ishibashi's idea from the start.[46]

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[42] Kojima Naoki, *Sōgyōsha Ishibashi Shōjirō: Burijisuton Keiei no Genten* (Tokyo: Shinchosha, 1986). NDL Digital Collection <<https://dl.ndl.go.jp/pid/12253236>> p. 45.
[43] *Burijisuton*, p. 32-33.
[44] Learmouth, 'British Trading Companies and Tacit Knowledge Seeding'.
[45] *Burijisuton*, p. 31.
[46] Kojima, *Sōgyōsha*, p. 46.

With Kimijima on the technical side and Dan on the managerial side, Ishibashi had just enough support to press on with his tyre venture.

By this time, Mitsui Bussan had become the leading raw rubber trader in the huge US market. Its Singapore branch was also rising to the challenge of supplying the New York branch and between 1929 and 1931 doubled its shipments of Malayan rubber to Japan, and ramped up its shipments to the US tenfold.[47] If they were initially sceptical, it was not long before Mitsui Bussan were fully on board with Ishibashi and their group director Dan. Mitsui Bussan's machinery division conducted a survey of the automobile tyre industry in December 1930 in preparation for handling and exporting Nihon Tabi's tyres. The plan appears to have been to use their domestic sales channels from an unsuccessful U.S. Rubber contract to sell Nihon Tabi tyres in Japan. The report noted that Nihon's automobile tyre production was still in its research and testing phase but also highlighted potential export markets in noting that the Straits Settlements, China, Hong Kong, Kwantung, Hong Kong, and British India absorbed most automobile tyres exported from Japan in 1928 (almost entirely from Dunlop Far East).[48]

Earlier in 1930, Ishibashi Shōjirō had sat down with Hirschberger and Strauss from L. J. Healing to think of a brand name for Nihon's new tyres. Western-sounding brands still evoked quality in Japan and most Western tyre companies were named after their founder. As such, their first idea was Stonebridge which was a literal English translation of Ishibashi (*ishi* = stone, *bashi* = bridge). However, the perception was that Stonebridge did not roll off the tongue, so they flipped the characters around and settled on the name Bridgestone. Around this time, Dan Takuma encouraged Ishibashi to make Nihon Tabi's tyre division independent. On 18th January 1931, Bridgestone was established as an independent concern.[49]

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[47] Ueyama Kazuo, *Hokubei ni okeru Sōgō Shōsha no Katsudō*, p. 337.
[48] Bussan Chōsa 106-152. *Jidōsha Taiya no koto, Gyōmu-ka*. December 1930.
[49] *Burijisuton*, p. 36.

In the July 1931 meeting between Mitsui Bussan branch heads, Moji chief Hasegawa outlined that his branch would stop handling U.S. Rubber's tyres and look to sell Bridgestone tyres within Japan. He added that it was still unclear whether Nihon Tabi would choose Mitsui and noted rumours that Mitsubishi had applied to act as a sales agent.[50] As it happened, Bridgestone did not sign a domestic sales contract with either Mitsui or Mitsubishi. Instead, they decided to use the Nihon Tabi distribution system to build up their own domestic sales network. Part of the decision may have been down to the fact that Mitsui did not have a great track record selling U.S. Rubber tyres in Japan. Mitsubishi had a much better track record selling Goodyear tyres in Japan, but linking up with them would have undermined the whole Mitsui-Ishibashi alliance.

The more pressing issue for Bridgestone at this time was the quality of their tyres. Nihon had produced their first tyre prototype in April 1930 and began test sales in October 1930. The early prototypes were poor in quality and chiefly based on the simple instruction booklets which came with the imported machinery, involving significant trial-and-error. As had been the case after buying machinery to produce rubber footwear eight years earlier, Nihon had the machinery but no experienced engineers able to operate them. The only source of skilled Japanese motor tyre engineers at this time was Dunlop Far East in Kobe. As such, Nihon identified two senior engineers at Dunlop, Suzuta Masatatsu and Matsudaira Nobutaka, and set about poaching them. Both engineers also had a formal engineering background at Kyoto Imperial University. Matsudaira had graduated in mining and metallurgy in 1922, while Suzuta had graduated in mechanical engineering in 1923. In October 1930, Kitajima travelled to Kobe on behalf of Kimijima to convince Suzuta and Matsudaira to jump ship. Kitajima was joined in November by sales manager Hayashi Zenji and future factory manager Akiyoshi Isao. While they may also have simply offered Suzuta and Matsudaira more money, Nihon appealed to the patriotic sentiment of the Dunlop engineers by pitching a world-leading car tyre manufacturer with purely Japanese capital and purely Japanese engineers.

[50] *Mitsui Bussan Shiten-chō Kaigi Gijiroku* 16. Moji Shiten-chō (1931), p. 33.

Either way, they succeeded and both engineers joined Bridgestone in early 1931. Suzuta was appointed head of engineering and was also in charge of design, while Matsudaira was appointed chief chemist and put in charge of tread and cushion rubber compounding. Hirschberger was responsible for tyre casings and general rubber compounding until he left the company in 1933. In February 1932, on Suzuta and Matsudaira's recommendation, Bridgestone poached another Dunlop engineer named Isayama Kōgoro, who was appointed head of design. While not educated at one of the four Imperial universities which existed at the time, Isayama had graduated from the Osaka Institute of Technology in 1916.[51] Ahead of the construction of Bridgestone's new factory on land purchased in Kyōmachi next to the Nihon Tabi factory, Suzuta travelled to the US in April 1932 to inspect Akron's tyre factories, while Akiyoshi inspected various tyre factories in Europe and the US in September that year.[52]

While their experience at Dunlop was critical, Suzuta and Matsudaira also helped deepen Bridgestone's pool of Imperial university-educated engineers beyond Kimijima's protégé Kitajima. The importance of formally educated rubber chemists in the new motor tyre segment of Japan's rubber industry contrasted with the earlier reliance in Kobe on rubber compounding specialists (*haigō-shi*) possessing secret recipes and trained purely through on-the-job apprenticeships. Bridgestone's embrace of high-level engineering education, on top of in-company training at the Japanese tyre industry's lead firm, fits Braguinsky's addition to the Klepper framework of the importance of Imperial university engineers in the absorption of best-practice manufacturing knowledge, exemplified by Kanebō in the cotton spinning industry.[53]

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[51] *Jinji Kōshinroku, Dai 15-ban Jō* (Tokyo: Jinji Kōshin Shinsho, 1948). NDL Digital Collection <<https://dl.ndl.go.jp/pid/2997934>>, p. 73.
[52] *Burijisuton*, pp. 33-35 & 42. Bridgestone Corporation, *Burijisuton 50 Nen-shi* [Bridgestone 50-Year History], (Tokyo: Bridgestone, 1982), p. 35.
[53] Braguinsky, 'Knowledge Diffusion and Industry Growth'. Yamaguchi Shotaro, Serguey Braguinsky, Okazaki Tetsuji, and Yuki Takenobu, 'Resource Allocation and Growth Strategies in a Multi-Plant Firm: Kanegafuchi Spinners in the Early 20th Century', *Strategic Management Journal* Early View (2023), pp. 1–35 (pp. 5 & 16). Yamaguchi Shotaro, Inoue Hiroyasu, Nakajima Kentaro, Okazaki Tetsuji, Saito Yukiko, and Serguey Braguinsky, 'Invention by College Graduates in Science and Engineering during Japan's Industrialization', *RIETI Discussion Paper Series* 22-E-104 (November 2022).

The absorption of high-level Dunlop engineers substantially improved the quality of Bridgestone tyres. Even so, the new company first had to concentrate its efforts on the replacement market, focusing on repair garages, small tyre shops and Nihon Tabi distributors. To build the consumer trust required to compete with Dunlop and Goodrich, Bridgestone implemented a costly returns policy in which they offered to freely replace any tyre that was faulty. Consumers were sceptical whether a humble *tabi* company could produce good quality car tyres and some took advantage of the returns policy by deliberately damaging the tyres. In the first three years of the company's existence, 100,000 tyres were returned. Around this time, there were rumours that Bridgestone was about to go bankrupt. However, as tyre manufacturing knowledge with Dunlop heritage and heavy investment in new equipment by Ishibashi improved quality, the number of returned tyres began to fall in 1932. That year, Bridgestone tyres passed Ford's strict quality test which made them, in theory at least, eligible to supply Nippon Ford in Yokohama.[54]

As Nihon's Bridgestone venture began to find its feet, Tsuchiya Tabi also began exploring diversifying into automobile tyres. In 1932, the Japanese chemical industry yearbook reported that Tsuchiya had drawn up plans to move into automobile tyre production with capital from Goodyear.[55] Goodyear was the obvious choice given its success in the Japanese automobile tyre market in the 1920s and the mutual connection both Goodyear and Tsuchiya had to Mitsubishi Shōji. Indeed, Mitsubishi recommended Tsuchiya's proposal to Goodyear. However, the Akron tyre-maker declined the proposal.[56] Goodyear President Paul Litchfield later recalled that the suggestion of a Goodyear factory in Japan 'had been made more than once by my associates, but I had always turned it down.' He claimed that as long as Japan's political leaders had 'war and conquest in their minds', building a Japanese plant would be foolish, adding that any investment

[54] *Burijisuton*, pp. 39-41.
[55] *Kagaku Kōgyō Nenkan Shōwa 8-nen* [Annual Report on the Chemical Industry 1933] (Tokyo: Kagaku Kōgyō Jiho-sha, 1932), p. 168.
[56] *Ritsugyō Bōeki Roku* (Mitsubishi Shōji) (Shashi de miru Nihon Keizai-shi, Dai 34-ken), Jō (Volume 1) (Tokyo: Yumani Shobō, 2009), p. 257.

'would be wiped out in case of a war.'[57] The failure of long-term rival Tsuchiya's plan to manufacture automobile tyres – with technical knowledge from the world's leading tyre-maker – would have come as a relief to Ishibashi. Goodyear instead decided to build a small factory in Java which opened in 1935. Run by Bridgestone during the Japanese occupation of the island in the early 1940s, Goodyear's Java factory would connect to the forming of a close relationship between Bridgestone and Goodyear in the post-war era.

4.2 Early Inroads into Export Markets

Overseas sales were a crucial early pillar of support for Bridgestone. Through Mitsui Bussan, Bridgestone were able to penetrate export markets almost immediately. In the four-year period between 1932 and 1935, Bridgestone's export ratio was consistently above 25 per cent. Shunned by Bridgestone as a domestic sales agent, Mitsui Bussan's strength was in their vast overseas sales network which provided the borrowed capacity for Nihon Tabi's export success. The Moji branch chief was confident in July 1931 that Bridgestone would ramp up sales domestically and tipped their automobile tyres for export success in China and India.[58]

In December 1932, an employee from Mitsui Bussan's Moji branch and two Bridgestone employees conducted market research in regions such as Southeast Asia, India, and New Zealand.[59] Bridgestone then followed its sister company by signing an exclusive overseas sales agreement with Mitsui Bussan's Moji branch in November 1933 covering China, Hong Kong, the Straits Settlements, Siam, Sumatra, Java, British India, and New Zealand, with a plan to entrust to Mitsui any further overseas sales destinations.[60] Bridgestone dispatched young employees from its new overseas department to Mitsui branches in cities such as Hankou (Wuhan) and Calcutta where they linked up with Nihon Tabi employees.[61]

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[57] Paul W. Litchfield, *Industrial Voyage: My Life as an Industrial Lieutenant* (New York: Doubleday and Co., 1954), p. 307.
[58] *Mitsui Bussan Shiten-chō Kaigi Gijiroku* 16. Moji Shiten-chō (1931), p. 33.
[59] *Burijisuton*, p. 41.
[60] Mitsui Bussan 2393. *Kaigi Tsuzuri*. 11th November 1933.
[61] *Burijisuton*, p. 41.

To ensure continuity with the Nihon Tabi business, Bridgestone tyres were handled by Mitsui Bussan's Sundry (*Zakka*) Department, rather than by the Machinery Department which had previously handled motor tyres.

In 1933, exports generated 35 per cent of Bridgestone's sales. While the weak yen certainly helped, this was an exceptionally high export ratio for a company established just two years earlier. Bridgestone would not surpass its foreign sales ratio of that year until 1998.[62] As Mitsui had targeted, Bridgestone's initial export success was concentrated in China, British India, the Straits Settlements and New Zealand, which had also been the destinations for most exports from Dunlop Far East.

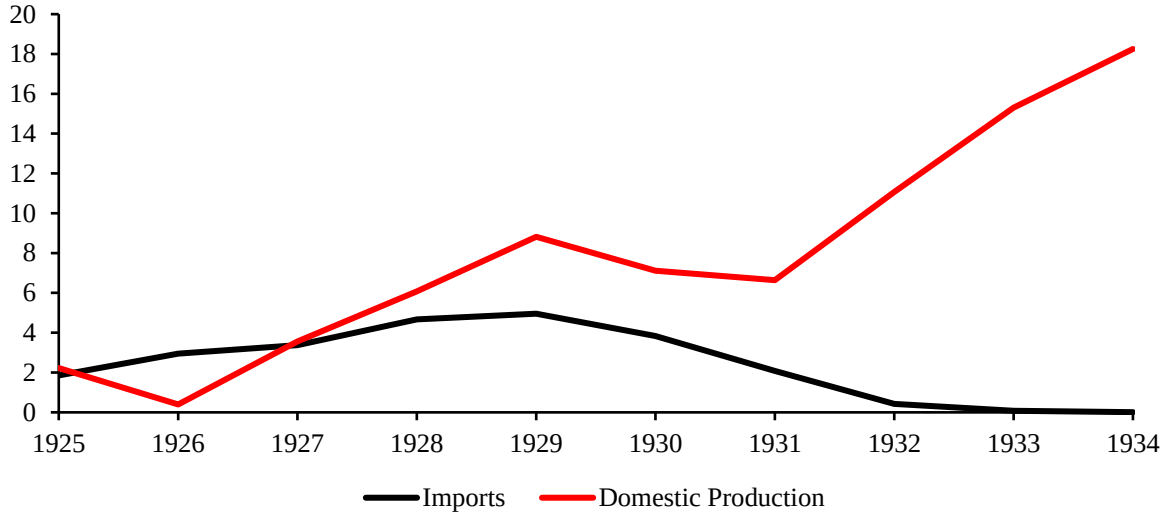
5. Bridgestone Challenges Dunlop and Goodrich

5.1 Bury Dunlop, leader of anti-Japonism!

This section analyses how Bridgestone built on their strong managerial and technological foundations through the use of nationalist marketing strategies to discredit their foreign-owned competitors and the hiring of a former Goodyear salesman to secure their first original equipment contract. In 1930, imports held around half of the Japanese automobile tyre market. Just three years later, in 1933, imports had shrunk to near zero.[63] Figure 3 shows the surge in domestic production from 1931 to more than compensate for the disappearance of imports.

[62] *Burijisuton*, *Shiryō-hen*, pp. 146-151.
[63] Kazutomi Majima, 'Honpō Jidōsha Taiyā Jukyū no Gaikyō', *Nihon Gomu Kyōkai-shi* 8.3 (1935), pp. 153–59 (p. 157).

Figure 3. Automobile Tyre Imports & Domestic Production (Million Yen)



Note: Includes domestic production for export.
Sources: Burijisuton, p. 44; Ueda, Small Industries, p. 187; Kōjō Tōkei-hyō Shōwa 2-nen [Factory Statistics for 1927].

This rapid process of import substitution, in an expanding market, was down to the introduction of domestically produced Bridgestone and Goodrich tyres in a macroeconomic environment which had turned decisively against imports. Despite the favourable conditions for local production, challenging Dunlop and Goodrich – which finally now had a plant in Japan through Yokohama Rubber – was a sizeable task for Bridgestone. Yokohama Rubber – part owned by the Furukawa *zaibatsu* – was not viewed as a Japanese company by Bridgestone who saw themselves as combating an American Goodrich and a British Dunlop in their home market.[64] To fill the space left by Goodyear and other imported tyres, Bridgestone embarked on an aggressive marketing campaign and tried to undersell Dunlop and Goodrich tyres in the domestic replacement market.

As figure 4 shows, Bridgestone began marketing their tyres as *junkokusan*, a 'pure domestic product'. Presented as a 'national emergency' by the Ishibashi group, *junkokusan* appealed to the same patriotic sentiment mobilised to entice senior engineers away from Dunlop.[65] While such an advert may have fallen on deaf ears

[64] Nihon Tabi & Bridgestone, *Honpō ni okeru Gomu Kōgyō*, p. 5.
[65] Nihon Tabi & Bridgestone, *Honpō ni okeru Gomu Kōgyō*, p. 4.

in the more cosmopolitan atmosphere of the 1920s, it tapped into the new *zeitgeist* of the 1930s. The era of Taishō democracy was giving way to Shōwa nationalism in the wake of the Great Depression and the military's establishment of Manchukuo as a puppet state in China. Ishibashi carefully juxtaposed the nationalist sentiment of *junkokusan* against the English brand name of Bridgestone which tapped into the still-strong public association between foreign products and quality. Incidentally, Bridgestone sounded English enough to prompt US tyre-maker Firestone to file a lawsuit against the Japanese company in 1933. Bridgestone won the case by demonstrating that their name was a literal translation of Ishibashi.

Figure 4. Advert for Bridgestone Tyres, 1932-33

Note: The text in the top left reads *junkokusan*.
Source: Displayed at the Shojiro Ishibashi Memorial Museum, Kurume.

Bridgestone also appears to have used disinformation campaigns to undermine its foreign rivals. On 18th August 1933, the local newspaper *Kōbe Yūshin Nippō* published an article with the headline 'Bury the false gentleman of inhumanity and the masked British: Dunlop Rubber's suspicious behaviour poisoning the empire: The company is the giant of the anti-Japanese movement: Manager Wilson dances in the shadows! A curse on the country'. The hyperbolic article suggested that anti-Dunlop fervour in Japan was growing fiercer by the day and accused factory manager V. B. Wilson of lobbying in favour of tariffs on Japanese

goods across the British Empire. It added that the poor quality of Dunlop's tyres since their 'best engineer' Suzuta had departed for Bridgestone, including those supplied for GM's 1933 Chevrolet cars, had severely damaged the company's reputation. It also provided examples of Japanese city buses switching from Dunlop to Bridgestone tyres. Along with Wilson, Dunlop vice-manager George Murphy was described as 'anti-Japanese', and it was added that the Japanese military authorities 'are always suspicious of the Dunlop Company's activities.'[66]

On 22nd August, the British Embassy in Tokyo received a despatch from the British Consulate in Kobe outlining the 'new manifestation of the present regrettable anti-British agitation'. Containing an English translation, the despatch characterised the Kobe newspaper article as 'an onslaught on the Dunlop Company' which contained 'a tissue of falsehoods'. It added that the same day the article was published, posters were put up and handbills distributed in Kobe announcing a public meeting with headlines such as "Expel British Capital!", "Bury Dunlop, leader of anti-Japonism!", and "Tear off the mask from England, the self-styled 'gentleman'!" The dispatch concluded with the suggestion that the newspaper article, 'and probably also the public meeting, were a piece of propaganda engineered and paid for by the Bridgestone Rubber Company, which has for some time been envious of the Dunlop Company's position.'[67]

Ahead of the completion of Bridgestone's new Kurume factory, Suzuta travelled overseas to select and purchase suitable machinery, while Akiyoshi was appointed as the new factory's manager in August 1933. The five-story reinforced concrete factory was completed in December 1933 and began fully operating in March 1934.[68] That year, there was a fierce price war between the big three producers which contributed to a collapse in prices. Indeed, Bridgestone ran at a loss in 1933 and 1934 as it attempted to wrestle market share from Dunlop and Goodrich in

[66] *Kōbe Yūshin Nippō*, 18th August 1933, pp. 173-174. Kobe University Newspaper Clippings Collection 3-110 <<https://hdl.handle.net/20.500.14094/0100362694>>
[67] *Foreign Office Files for Japan, 1931-1945*. FO 262/1858. Foreign firms in Japan: 1933, pp. 5-10 << https://www.foreignofficefilesjapan.amdigital.co.uk/>>
[68] *Burijisuton*, pp. 42-43.

the replacement market.[69] Around this time, Bridgestone also stepped-up efforts to enter the original equipment (OE) market. While Bridgestone had met Ford's standard for OE tyres in 1932, that was no guarantee of a lucrative contract. In 1935, Bridgestone employed Mortimer C. Cook as a contract worker. Cook had worked at Mitsubishi Shōji's office as the head of Goodyear's Japan sales department. He applied to work at Bridgestone after Goodyear had been shut out of the Japanese market by the depreciated yen and higher tariffs and had declined Tsuchiya's proposal. Cook had a close friendship with Ford's company manager in Japan and became instrumental in securing Bridgestone's first original equipment deal. The Ford contract secured by Cook helped give Bridgestone a firm footing in a new three-way oligopoly in the domestic automobile market. By 1935, Bridgestone had secured a 32.2 per cent share of the domestic market in quantity terms, and a 30.9 per cent market share in values terms.[70] The lower market share in values terms reflected the 5-6 per cent premium Dunlop tyres had over Bridgestone tyres. To undercut Dunlop and Goodrich on price, Bridgestone's Kurume factory saved on some machinery by employing low-cost female labour for processes such as tyre building.[71]

5.2 Bridgestone-Dunlop Rivalry Carried into the British Empire

Bridgestone's domestic rivalry with Dunlop soon extended into the British Empire, most importantly to India where Dunlop opened a large new factory in Calcutta in 1936. Data on automobile tyre exports from the port of Moji are an almost perfect proxy for Bridgestone's exports, since there were no other tyre companies exporting from Moji. Indeed, Mitsui Bussan themselves analysed export competition between the three auto tyre producers in Japan with the assumption that shipments from Moji were Bridgestone tyres, shipments from Kobe were Dunlop tyres, and shipments from Yokohama Goodrich tyres. Sales of cheaper Bridgestone tyres were consistently higher than those of tyres manufactured by Dunlop Far East and Yokohama Rubber in Asian export markets during this

[69] *Burijisuton*, *Shiryō-hen*, p. 146.
[70] *Burijisuton*, pp. 42-44.
[71] Nihon Tabi & Bridgestone, *Honpō ni okeru Gomu Kōgyō*, p. 55.

period. In real values terms, Moji's share of Japanese auto tyre exports rose from 47 per cent in 1933 to a peak of 61 per cent in 1935, before falling back to 47 per cent in 1937.[72]

As shown in table 3, British India was by far the largest export market for Bridgestone tyres before 1937. Bridgestone's other key early export markets included the Dutch East Indies and British Malaya, the regions from which they sourced their raw rubber inputs. In 1937, there was a huge jump in exports to Kwantung (the gateway to Manchuria), also mirrored in the Kobe and Yokohama data, due to the outbreak of the Second Sino-Japanese War in July that year. The data also shows, from 1936, a pivot in Bridgestone exports towards new markets less hostile towards Japanese expansionism such as Nazi Germany and Brazil. The year 1937 marked Bridgestone's export peak in yen terms until after the war. At three-million-yen, Bridgestone tyre exports that year came close to the total value of canvas shoes shipped from Moji.

[72] *Sundry Commodities of Mitsui Seattle*, Box 37, Rubber 1936-41. NARA. Deflated by 'Price Indexes of Manufactured Goods by Commodity: Rubber Tires', 1934-36=100, Dai 16 Hyō-5 in *Volume 8: Prices, Long-Term Economic Statistics*. << https://d-infra.ier.hit-u.ac.jp/English/ltes/a000.html>>

Table 3. Exports of Automobile Tyres & Tubes from the Port of Moji (Nominal Yen, 1933-1937)

Region	1933	1934	1935	1936	1937	Total
British India & Ceylon	665,072	641,013	615,294	673,488	732,567	3,327,434
Kwantung Leased Territory	132,516	92,306	171,304	289,061	934,877	1,620,064
Dutch East Indies	269,588	426,912	521,773	186,397	210,627	1,615,297
Straits Settlements & British Malaya	155,829	160,293	170,362	159,249	174,935	820,668
China	78,026	146,718	179,984	158,953	69,177	632,858
Brazil	255	20,048	98,390	237,986	196,221	552,900
East Africa	102,214	24,986	84,567	105,856	58,062	375,685
Germany	246	96	47	173,085	177,401	350,875
New Zealand	106,217	27,427				133,644
All Other Regions	109,384	299,646	416,393	280,542	369,132	1,475,097
Total	1,619,347	1,839,445	2,258,114	2,264,617	2,922,999	10,904,522

Note: The Moji customs data matches almost exactly the total annual export values between 1933-37 in the official Bridgestone statistics (*Burijisuton Shiryō-hen*, p. 146).
Sources: Data from 1933 to 1936 is from *Seized Correspondence Regarding Import and Export of Sundry Commodities of Mitsui and Company Ltd. of Seattle*, Box 37, Rubber 1936-41. Data for 1937 is from Nihon Gomu Seihin Yushutsu Kumiai No. 10, pp. 216-217.

Mitsui Bussan's Singapore branch had reached the peak of its rubber trading powers in 1936 when it controlled 50 per cent of Malayan raw rubber shipments to Japan and 20 per cent of shipments to the much larger US market.[73] In October that year, Mitsui renewed its exclusive overseas sales contract with Bridgestone for three more years. Golf balls were added as a new item, and Egypt and Germany were added as new sales destinations.[74] By this time though, Mitsui Bussan's success in creating new markets for Bridgestone products was eroding the need for Bridgestone to rely on Mitsui. A common conundrum for trading companies, Bridgestone soon began engaging in direct sales to overseas wholesalers and retailers. As table 4 shows, Bridgestone were able to establish channels for direct exports between 1932 and 1935, reducing their exclusive overseas agent Mitsui's share from 78 per cent to 56 per cent.

Table 4. Bridgestone Export Volumes (Number of Tyres, 1931-1936)

Year	Through Mitsui Bussan	Direct Sales	Total Exports	Mitsui Share (%)
1931	1,928	24	1,952	98.8
1932	8,892	2,559	11,451	77.7
1933	52,516	26,665	79,181	66.3
1934	61,000	37,658	98,658	61.8
1935	52,106	40,215	92,321	56.4
1936*	49,476	37,603	87,079	56.8

Note: *10-month period (March to December 1936).
Sources: From *Sundry Commodities of Mitsui Seattle*, Box 37, Rubber 1936-41.

In March 1937, Mitsui Moji provided other Mitsui branches with a detailed breakdown of the direct sales of Bridgestone tyres which had bypassed them between 1931 and 1936. The top destination for direct sales across this period was Colombo in British Ceylon – where 40,481 tyres were sold – while around 15,000 tyres were sold to a wholesaler named Takim stationed in Mombasa and Zanzibar. Takim was also the first overseas firm to purchase from Bridgestone directly in a trial order of 24 tyres sent to Zanzibar in 1931 (shown in table 4). In January 1936,

[73] Ueyama Kazuo, *Hokubei ni okeru Sōgō Shōsha no Katsudō*, p. 340.
[74] New Zealand was the one country removed from the new contract. Mitsui Bussan 2404. *Kaigi Tsuzuri*. 22nd October 1936.

Mitsui themselves listed three reasons why they thought their share of Bridgestone's exports had decreased: (1) the rapid development of direct exports by Bridgestone to South America, (2) their loss of New Zealand as a promising export market, and (3) the decline in the value of shipments to Hong Kong and India.[75]

6. Conclusion

Japan is of fundamental importance to our understanding of late industrialisation as it represents the only case outside the West of sustained industrial development before the Second World War.[76] The growth of manufacturing based on the absorption and adaption of Western useful knowledge was the engine behind Japanese catch-up growth which began around 1890. While real GDP growth in Japan was weak during the 1920s, the interwar period represents a crucial phase in Japanese development when industrial capacity was upgraded from textiles to higher value-added heavy and chemical industries – an essential foundation for rapid economic growth after 1955. Moreover, between 1920 and 1935, Japanese manufacturing output per worker more than doubled and as a share of British industrial output per worker rose from 31 per cent to 42 per cent. Meanwhile, Japan's share of world manufacturing exports jumped from 2.5 per cent in 1913 to 7.4 per cent in 1937.[77] The transformation of Kurume also formed part of the catch-up of Fukuoka Prefecture towards the income levels of the core regions of Tokyo and Osaka. Fukuoka's Prefectural gross value added (GVA) per capita jumped 74 per cent between 1925 and 1940. During this time, the share of the chemical industry in Fukuoka's GVA rose from 10 per cent to 25 per cent.[78]

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[75] *Sundry Commodities of Mitsui Seattle*, Box 37, Rubber 1936-41.
[76] Penny Francks, *Japanese Economic Development: Theory and Practice* (Abingdon: Routledge, 2015), p. 253.
[77] Stephen Broadberry, Kyoji Fukao and Tokihiko Settsu, 'How Did Japan Catch-Up with the West? Some Implications of Recent Revisions to Japan's Historical Growth Record', *Asia-Pacific Economic History Review* Early View (2025).
[78] 'Prefectural Gross Value Added by Industry (1890, 1909, 1925, 1935, 1940)' in Tangjun Yuan, Tokihiko Settsu, Jean-Pascal Bassino and Kyoji Fukao, *Database on Gross Prefectural Product in Prewar Japan*. https://d-infra.ier.hit-u.ac.jp/English/ltes/a000.html

The acquisition of rubber manufacturing knowledge in Kurume began with a partnership between Tsuchiya Tabi and Dunlop Far East to develop a high-quality *jika tabi*. During the inter-war period, the two Kurume *tabi* makers further embraced large-scale factory production and formed close connections with *sōgō shōsha* to develop leading global canvas shoe brands. This foundation provided a knowledge base to absorb top engineering talent with formal chemistry training and sophisticated technical knowledge inherited from Dunlop's Kobe factory. As a result, the provincial town of Kurume was able to shift its industrial base from cotton *tabi* manufacturing to motor tyre manufacturing in less than two decades.

Nihon succeeded in international business by borrowing capacity from Mitsui. Kurume – and Nihon in particular – thus acquired a high level of suitability for the kind of mass production required to succeed in motor tyre manufacturing. This explains why the only successful motor tyre 'spin-off' from Dunlop Far East emerged in Kurume in the form of Bridgestone. Nihon Tabi's Bridgestone capitalised on its operational strength by employing aggressive marketing strategies which made use of the nationalist turn in the 1930s and by using Mitsui to gain a footing across Asian markets. When considering lessons for latecomer industrialisation beyond Japan, this study of inter-war Kurume suggests that upgrading traditional industries can form a strong platform for the absorption of higher-level technical knowledge embedded in Western multinationals. In turn, this represents – at the cluster level – a mechanism for rapid catch-up growth of the kind conceptualised by Gerschenkron.

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