

REFINING RUBBER: HOW MALAYSIA BUILT GLOBAL DOMINANCE IN MEDICAL GLOVE MANUFACTURING

Over several decades, Malaysia has transformed its rubber sector into the world's leading medical examination glove manufacturing industry, producing at its peak 65% of global supply and remaining the largest single producer today.¹ Deliberate state intervention, strategic private investment, and industrial upgrading - including a shift from natural latex to synthetic nitrile glove production - have progressively moved the industry up the value chain from raw commodity exports to high-value manufacturing.

However, the industry's systemic dependence on cheap labour has damaged its reputation, and intensifying competition from Chinese manufacturers has eroded its market share, threatening its long-term viability. This case study explores how Malaysia built and sustained its grip on global glove manufacturing as well as the structural challenges it now faces.

FROM PLANTATION TO PRODUCTION LINE

Malaysia's rubber industry dates to the late 19th century, when the crop was first commercially cultivated after being introduced by the British. Until Independence in 1957, Malaysia predominantly produced primary commodities, with rubber and tin accounting for 85% of export earnings.²

From the late 1950s onwards, already industrialised countries began producing synthetic rubber, reducing demand for Malaysia's primary rubber exports. Malaysia initially responded by diversifying into oil palm. However, to avoid dependence on primary commodity exports - the fate of many resource-rich countries - successive governments also pursued a more ambitious strategy of vertical integration in rubber, moving downstream to process it into higher-value manufactured goods, including medical examination gloves. This process laid the foundations for Malaysia's later dominance of the global glove industry, shifting its competitive advantage from raw rubber to accumulated manufacturing capabilities and institutional knowledge.³

The HIV/AIDS epidemic in the late 1980s was a turning point for the medical examination glove sector specifically, generating a sudden surge in global demand. Drawing on the foundations laid through decades of state investment, private manufacturers were well positioned to respond rapidly and Malaysia quickly became the dominant global supplier, with imports of disposable examination gloves to the US alone surging from 3.9 billion pieces in 1989 to 25.3 billion pieces by 1998.⁴

By the early 1990s, the industry had grown to around 250 manufacturers, including both domestic firms and foreign producers primarily from Taiwan and the United States.⁵ However, the 1997-1998 Asian financial crisis drove out most foreign producers, consolidating the industry around a smaller number of domestically owned firms. The industry also made a deliberate transition from natural latex to synthetic nitrile gloves from the late 1990s onwards, in response to growing latex allergies among healthcare workers, and capitalised on successive global public health crises, from SARS and H1N1 to Ebola, before the unprecedented surge in demand of the COVID-19 pandemic. As of March 2026, Malaysia remained the world's leading rubber glove producer, fulfilling around 45% of global demand, with the industry dominated by the "Big Four" manufacturers - Top Glove, Hartalega, Kossan, and Supermax.⁶

POLICY QUESTIONS FOR CONSIDERATION

- Is there a natural resource or other existing sector in your country that could be developed into higher-value manufacturing with greater state support? What institutional investments would this require? What would be the main political and economic obstacles to pursuing them?
- How effectively does the relationship between the state and private sector in your country's strategic industries enable industrial upgrading?
- Industrial strategies can create long-term dependencies as well as competitive advantages. How would you identify whether such risks exist in your country's context, and how would you manage them?

¹ Hutchinson, F.E. and Bhattacharya, P. 'Malaysia's Rubber Glove Industry - The Good, the Bad and the Ugly' *ISEAS Perspective* 2021(35)

² Goldthorpe, C.C. (2015) 'Rubber Manufacturing in Malaysia: Resource-based Industrialization in Practice' NUS Press

³ Tham, S.Y. (2024) 'Post-independence development of rubber products manufacturing in Malaysia' *Economic History Malaysia*

⁴ Kawano, M. (2019) 'Changing Resource-Based Manufacturing Industry: The Case of the Rubber Industry in Malaysia and Thailand' in Tsunekawa, K. and Todo, Y. (eds) *Emerging States at Crossroads* (Springer)

⁵ Ibid.

⁶ MARGMA (March 2026) 'Rubber Glove Sector Hit By Raw Material Shortage Urges Government To Act' *Business Today*

SUCCESS FACTORS

Malaysia's dominance in medical glove manufacturing was built on three interconnected factors: deliberate, long-term state industrial policy that created the institutional, technical, and commercial foundations for higher-value manufacturing; private sector dynamism that drove technological innovation and effective industry self-organisation; and the industry's ability to turn successive spikes in global demand to its advantage, drawing on the foundations already in place.



State-led Industrial Upgrading

While Malaysia's existing rubber base gave it an initial comparative advantage, deliberate and coherent industrial policy enabled its dominance in medical glove manufacturing. Successive governments used revenues from rubber exports to fund the research institutions, quality infrastructure, and promotional agencies that enabled the sector's technical and commercial development. They also implemented three Industrial Master Plans spanning 1986–2020. These provided consistent policy direction over three decades that built the institutions and technical capacity needed to move the industry from raw commodity exports toward higher-value manufacturing.⁷

Malaysia's policy continuity was enabled by its specific political conditions. The consociationalist governing coalition, led from independence by the Alliance Party and by Barisan Nasional from 1973, governed Malaysia until 2018, allowing industrial policy to remain broadly consistent over several decades. It was further reinforced by the unusually long tenure of Prime Minister Mahathir who, known as Bapa Pemodenan or "Father of Modernisation", held office for 24 years across two terms and is widely credited with defining Malaysia's industrial trajectory. His 1982 Look East policy directed industrial development toward the active state-business partnership models of Japan and South Korea rather than the trade liberalisation the IMF and World Bank were promoting at the time.⁸ This scepticism towards prevailing international advice proved well-founded: following independence, the World Bank concluded that a country producing raw rubber was not well-placed to become a major manufacturer of rubber products, a judgment that Malaysia's subsequent industrial dominance disproved.⁹

This was translated into concrete policy through a range of targeted instruments. From the mid-1980s, the government's Malaysian Investment Development Authority (MIDA) introduced manufacturing incentives including pioneer status (income tax exemptions of up to five years), import duty elimination, and subsidised gas prices. These attracted both domestic entrepreneurs and foreign manufacturers from Taiwan and the United States, the latter contributing additional capital and production capacity during the industry's early growth phase.¹⁰ However, by 1991, the government had already withdrawn glove manufacturing from its promoted products list, suggesting that these incentives had achieved their catalytic purpose.¹¹ In addition to these fiscal incentives, via the Malaysian Rubber Board (MRB) the state gave domestic manufacturers access to publicly developed production technologies, an advantage which foreign competitors had to develop privately.¹² And, unlike in electronics where state incentives attracted foreign assembly without building domestic capabilities, or in automobiles where tariff protection removed the pressure to compete internationally, the state supported glove manufacturers without shielding them from foreign competition, instead actively promoting their access to international markets.¹³ This combination of state-provided technical foundations and exposure to genuine competitive pressure produced domestic firms that were both technically capable and competitive, able to sustain themselves once state incentives were withdrawn.

The MRB provided manufacturers with technical knowledge, testing services, and research and development (R&D) support across the rubber value chain.¹⁴ By the 1990s, 80% of Malaysian rubber firms, including glove manufacturers, used production technologies developed by the MRB, demonstrating the importance of this state-funded R&D to the sector's technical foundations.¹⁵ From 1993, Malaysia's national trade promotion agency, MATRADE, part of the Ministry of Investment, Trade and Industry (MITI), actively promoted

Figure 1: Rubber glove production output 1980s–2020



Malaysian gloves in export markets, helping manufacturers access and grow their international presence.¹⁶ State subsidies on energy costs and tax exemptions gave manufacturers a direct financial incentive to invest in local supply chains, domestic capabilities, and higher-value production.¹⁷

The state also backed industry-led initiatives, most significantly the Standard Malaysian Glove (SMG) certification scheme. Developed by the Malaysian Rubber Glove Manufacturers Association (MARGMA) in 1998 in consultation with international bodies including the US Food and Drug Administration (FDA), this enabled Malaysian manufacturers to gain the quality certification that international healthcare procurement systems increasingly required. These interventions addressed the technical, quality, and market access constraints that Malaysian manufacturers needed to overcome in order to compete in international healthcare supply chains.



Private Sector Dynamism

Domestic private sector enterprise also played a critical role in Malaysia's glove manufacturing success. Unlike more technologically complex sectors such as electronics, glove manufacturing had relatively low technical entry barriers, meaning domestic entrepreneurs could enter the sector and develop their own capabilities without relying on foreign firms for technology.¹⁸ This made it particularly accessible to Malaysia's ethnic Chinese entrepreneurs, who had the capital and commercial networks to build manufacturing businesses. The firms that later became the "Big Four" were all founder-led, and built their own brands and capabilities, whereas many smaller domestic firms produced on behalf of foreign companies.¹⁹ With their long-term futures tied to the Malaysian industry, domestically owned firms reinvested locally and built deeper supplier networks than their foreign counterparts, giving them stronger incentives to develop lasting capabilities than foreign manufacturers, whose investment was driven primarily by Malaysia's low production costs.²⁰ When the 1997–98 Asian financial crisis eroded those cost advantages and squeezed profit margins, foreign manufacturers including those from Taiwan and the United States ceased operations in Malaysia,²¹ while domestic firms survived and strengthened their position as the industry consolidated around the most capable manufacturers.

⁷ Tham, op. cit.

⁸ Khalid, K.M. and Ping, J.H. (2021) 'Look East Policy after 35 years from social sciences perspectives' *Cogent Social Sciences* 7(1)

⁹ Goldthorpe, op. cit.

¹⁰ Kawano (2019), op. cit.

¹¹ General Agreement on Tariffs and Trade (GATT) (1993) 'Policy Review Mechanism: Malaysia' World Trade Organisation

¹² Goldthorpe, op. cit.

¹³ Raj-Reichert, G. (2019) 'Global value chains, the electronics industry, and labour standards in Malaysia' *Journal of Development Studies*, 56(4); Lebdioui, A., Lee, K. and Pietrobelli, C. (2021) 'Local-foreign technology interface, resource-based development, and industrial policy' *Journal of Technology Transfer*, 46

¹⁴ Lebdioui, A. (2022) 'The political economy of moving up in global value chains: how Malaysia added value to its natural resources through industrial policy' in *Review of International Political Economy*, 29(3)

¹⁵ Goldthorpe, op. cit.

¹⁶ Malaysia External Trade Development Corporation (MATRADE) 'About MATRADE' MATRADE website

¹⁷ Lebdioui (2022), op. cit.

“Malaysia's dominance in medical glove manufacturing was built on deliberate, long-term state industrial policy; private sector dynamism that drove technological innovation; and the industry's ability to turn successive spikes in global demand to its advantage.”

The HIV/AIDS epidemic of the late 1980s generated a sudden spike in global demand for medical examination gloves. Drawing on the foundations laid through decades of state investment, Malaysian manufacturers scaled up production rapidly, establishing the country as the world's leading supplier by the early 1990s.²² In response to the rapid increase in demand, the government issued large numbers of manufacturing licences, leading to “an explosion of manufacturers with varying levels of production capacity and quality control, [and] creating a turbulent environment in terms of quality, competition, and pricing.”²³ Recognising that self-regulation was essential, in 1989 pioneer manufacturers formed the Malaysian Rubber Glove Manufacturers Association (MARGMA) to ensure quality standards and coordinate the sector's collective interests. Without MARGMA's quality benchmarks, competitive pressures might have driven individual manufacturers to cut corners, undermining the collective reputation on which market access depended. Manufacturers later drew on this same capacity for collective self-organisation to respond to subsequent public health crises.²⁴ Across this period and the decades that followed, continuous investment in automation and process improvement drove a dramatic transformation: rubber glove production output rose from around 3,000 gloves per hour in the 1980s to over 45,000 by 2020.²⁵

The private sector also demonstrated a capacity for proactive technological innovation and adaptation. When growing awareness of latex allergies from the late 1990s created demand for non-allergenic alternatives, Malaysian manufacturers led the global response. In 2005, Hartalega invented the world's first nitrile glove thin enough for clinical use, triggering a mass market shift that eventually saw nitrile account for around 60% of Malaysian glove production by the early 2020s.²⁶ As domestic manufacturers invested in new machinery and chemical processes, the state also supported the shift through continued R&D and fiscal incentives that made the transition commercially viable.



Capitalising on External Pressures

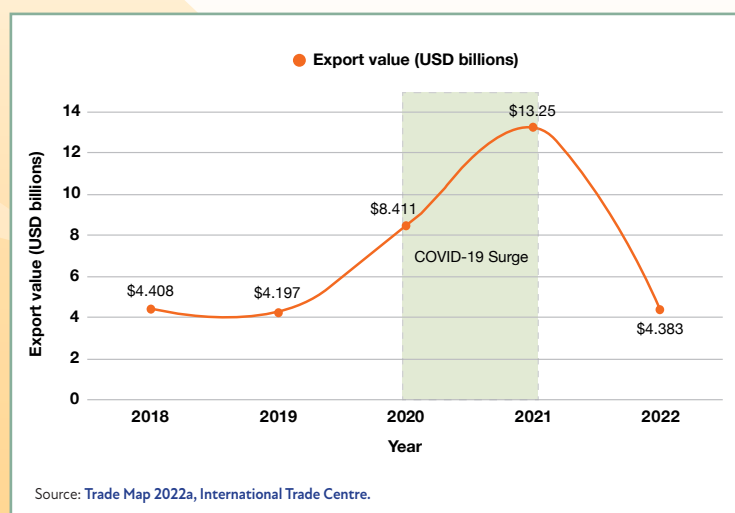
Malaysia's dominance was also shaped by successive external demand shocks that the industry proved consistently able to turn to its advantage. In response to the HIV/AIDS epidemic of the late 1980s, Malaysia established itself as the world's leading supplier of medical examination gloves, while the 2003 SARS epidemic, the 2009 H1N1 “swine flu” pandemic, and the 2014–2015 Ebola outbreak each drove further increases in demand that reinforced and deepened that position.²⁷ Malaysian manufacturers were well placed to meet these successive shocks because decades of state investment had given them the production capacity, certifications, buyer relationships, and credibility that international healthcare procurement systems required. Each crisis deepened those relationships and expanded market share in ways that less established suppliers could not replicate. The scale of COVID profits also attracted domestic firms from unrelated industries, including property developers, IT companies, and automation firms. However, without the capabilities that established manufacturers had already developed, most failed to begin production before the boom ended, and those that did produced a negligible fraction of the sector's output.²⁸

The COVID-19 pandemic was the most dramatic illustration of this dynamic, with global demand for medical gloves jumping from 340 billion pieces in 2019 to an estimated 500 billion pieces in 2021. Malaysia supplied around two-thirds of global demand at the peak, and the Big Four manufacturers reinvested the resulting revenues in expanding capacity and accelerating automation still further.²⁹ These investments proved critical as the industry faced new competitive pressures in the years that followed.

A SECTOR AT A CROSSROADS

Malaysia's dominance in medical glove manufacturing demonstrates the power of purposeful industrial policy and private entrepreneurship, but has come with significant costs. The industry illustrates a trap that many export manufacturing sectors fall into: once cheap labour is established as the basis of competitiveness, the industry develops a structural dependency on it that suppresses investment in automation and creates regulatory and reputational risks. In Malaysia's case, these have materialised into concrete threats to the industry's access to its most important markets. In 2019, 61% of the glove sector's 71,800 workers were foreign nationals, many working in conditions consistent with forced labour.³⁰ While the Malaysian government has periodically attempted to reduce this dependence, it has repeatedly failed to enforce stricter labour standards in the face of industry pressure. International healthcare buyers have also contributed to these conditions by awarding large contracts to suppliers despite their documented labour problems. However, the pandemic-induced increase in medical glove procurement brought unprecedented scrutiny to these longstanding

Chart 1: Value of Malaysian Rubber Glove Exports 2018–2022



¹⁸Lebdoui, Lee and Pietrobelli (2021), op. cit.

¹⁹Kawano, M. (2017) 'Upgrading Malaysia's Rubber Manufacturing: Trajectories and Challenges' in Khoo, B.T., Tsunekawa, K. and Kawano, M. (eds) *Southeast Asia Beyond Crises and Traps* (Palgrave Macmillan)

²⁰Goldthorpe, op. cit.

²¹Kawano (2019), op. cit.

²²Bhutta, M. and Santhakumar, A. (2016) 'In Good Hands: Tackling Labour Rights Concerns in the Manufacture of Medical Gloves' British Medical Association

²³MARGMA 'Background – Our Story' MARGMA website

²⁴Hutchinson, F.E. and Bhattacharya, P. (2020) 'Malaysia's Rubber Glove Industry – A Silver Lining Amidst Dark Clouds' ISEAS Perspective 2020(138)

²⁵Brady, M. (4 March 2021) 'How Malaysia's Booming Rubber Glove Industry is Innovating to Stay Ahead' World Health Expo

²⁶Kawano (2017), op. cit.

²⁷Hutchinson and Bhattacharya (2020), op. cit.

²⁸Biruntha, S. (14 June 2021) 'Labour supply disruptions widen opportunities for property players to enter glove industry' The Malaysian Reserve; Hutchinson, F.E. and Bhattacharya, P. (2021) 'Malaysia's Rubber Glove Industry – The Good, the Bad and the Ugly' ISEAS Perspective 2021(35)

²⁹Lim, J. (15 March 2021) 'MARGMA expects a shortfall of 80 bil pieces of rubber gloves this year as demand continues to outstrip supply' The Edge Malaysia

³⁰International Labour Organization (2022) 'Addressing, Preventing and Eliminating Forced Labour in the Rubber Industry in Malaysia: A Practical Guide for Malaysian Employers'

problems, and the sector's record profits made it hard to argue that stricter labour standards would threaten the industry's viability. From 2020, US Customs and Border Protection issued import bans on seven Malaysian glove firms on forced labour grounds, while the NHS overhauled its procurement framework after it emerged it had awarded contracts to suppliers with documented forced labour practices, including a £316 million contract with Supermax.³¹ Notably, these international reactions prompted faster action than years of domestic labour regulation had managed to deliver and under mounting foreign pressure, the Malaysian government launched a National Action Plan on Forced Labour and ratified the ILO Protocol on Forced Labour in 2022, though enforcement of labour standards remained inconsistent.³²

In response to these structural weaknesses, in September 2023 the Malaysian government launched its New Industrial Master Plan 2030 (NIMP 2030). This includes a specific strategy for the rubber sector, which prioritises investment in advanced manufacturing technologies, expansion into higher-value products, and greater carbon accountability. Whether it delivers will depend in part on whether the state enforces labour and environmental standards where it previously conceded to industry pressure, and if manufacturers - whose readiness to invest in automation is constrained by financial risk and thin margins - can find the resources and will to upgrade. In the three years since the plan was launched, competitive pressures have intensified significantly. China has deployed state industrial policy tools such as subsidies, preferential financing, and state R&D support³³ to build a globally competitive rubber glove manufacturing sector, much as Malaysia itself did in earlier decades, growing its market share from around 11% in 2019 to 34% by 2025.³⁴ For Malaysia, this makes the task of industrial upgrading both more urgent and harder to finance.

Malaysia's experience illustrates that market dominance, however firmly established, is not permanent. Malaysian manufacturers now face intense competition from Chinese producers who have entered the global medical glove market with cheaper coal-based energy, new highly efficient manufacturing facilities, and the backing of the Chinese government's broader MedTech industrial policy. Malaysian export revenues, which peaked at RM54.8 billion in 2021, had fallen

to an estimated RM14 billion by 2025 - below the pre-pandemic level of RM17.35 billion in 2019 - as Chinese competition combined with post-pandemic demand normalisation to suppress both prices and Malaysia's market share.³⁵ US tariffs on Chinese-made medical gloves - which reached 100% by January 2026³⁶ - initially gave Malaysian manufacturers a significant price advantage in the US market. However, Chinese manufacturers had already established plants in Vietnam and Indonesia as part of their broader expansion, and were able to use these facilities to supply the US market at lower tariff rates, while continuing to compete freely against Malaysian manufacturers elsewhere.³⁷

The industry's rapid expansion has also generated significant environmental costs. Glove manufacturing is highly energy- and water-intensive, and the shift to nitrile - a petroleum-based synthetic - has increased the sector's carbon footprint relative to natural latex. The nitrile transition has also created significant supply chain vulnerabilities. As a petroleum derivative, nitrile is exposed to global energy price volatility and geopolitical risk, most recently illustrated by Iran's March 2026 closure of the Strait of Hormuz, which caused severe nitrile shortages, forcing manufacturers to run below normal capacity and, in at least one case, to cease operations entirely.³⁸

Ultimately, the long-term position of Malaysia's medical glove industry depends on whether it can complete its transition to a higher-value model that is more automated, more compliant with global labour and environmental regulations, and capable of moving into more sophisticated products such as antimicrobial gloves that kill bacteria on contact and graphene-strengthened gloves that are harder to puncture.³⁹ Manufacturers have also begun diversifying into non-medical gloves, including for use in the food and beverage, beauty, and electronics manufacturing industries. Driven partly by new US tariffs and partly by rising demand in these sectors, this shift is reducing the industry's reliance on healthcare-driven demand cycles.⁴⁰ How far and how fast Malaysia can make this transition will determine whether it can maintain a competitive position as China's cost and scale advantage continues to grow, a challenge that middle-income countries increasingly face across a growing range of industries beyond gloves.

FURTHER READING

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ABOUT SOAS DEVELOPMENT LEADERSHIP DIALOGUE (DLD)

Economic and social development requires many actors: however, typically these have operated in separate spheres, not understanding each other well and even seeing each other as adversaries. In a world characterised by profound changes and heightened uncertainties, overcoming this 'silo-isation' and the lack of mutual understanding it leads to is ever more important. DLD brings people and disciplines together to generate more creative and strategic solutions to difficult development challenges. DLD is generously supported by Hyundai Motor Group UK Ltd. and Kia UK Ltd.

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³¹Russell, G. (30 January 2022) 'Covid: US Imposes 7th Ban on Malaysian Glovemakers over Forced Labour' Asia Financial; Campbell, D. (21 November 2021) 'UK investigates supplier of NHS PPE over alleged use of forced labour' *The Guardian*

³²International Labour Organization, op. cit.

³³Brown, A. et al. (20 November 2023) 'Investigating State Support for China's Medical Technology Companies' Mercator Institute for China Studies

³⁴TA Securities Research, cited in 'Threats still linger for rubber glovemakers' *The Borneo Post* (20 January 2026)

³⁵Malaysian Rubber Council (MRC), cited (11 March 2022) in *Bernama* 'Malaysia's rubber exports increases 46.3 per cent to RM71 bln in 2021'; Malaysia SME (27 March 2026) 'MARGMA Calls for Urgent Government Relief as Raw Material Shortage Hits Rubber Glove Industry'; MARGMA, cited in Lim, J. (15 March 2021) 'Malaysia's rubber glove revenue to grow 8% to RM38b this year, says MARGMA' *The Edge Malaysia*

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³⁹Sharp, N. (23 September 2024) 'The rise of Malaysia as a global MedTech manufacturing hub' *ESCATEC*

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