ERIA Discussion Paper Series

No. 423

Global Value Chains and Premature Deindustrialisation in Malaysia

Cassey LEE*

ISEAS – Yusof Ishak Institute

February 2022

Abstract: *Malaysia has experienced premature deindustrialisation since the early 1990s. The decline in the relative contribution of manufacturing to the economy has been underpinned by structural changes in the electronic, electrical, and machinery industries. There is evidence of a decline in the country's backward global value chain (GVC) participation in the manufacturing sector. Although its position in GVCs has been upgraded, the country's attractiveness as an outsourcing base has weakened. The contribution of foreign value-added in the manufacturing sector's export growth has also declined. Micro-level evidence points to weaknesses in terms of human capital and technology.*

Keywords: Structural Change, Deindustrialisation, Global Value Chain

JEL Codes: F12, L63, O14

* The author thanks Shujiro Urata, Ayako Obashi, and other participants of the Workshop for the GRIPS-ERIA Project Policy Research Network on Contemporary Southeast Asia. The usual caveats remain. Corresponding e-mail: casseylee@gmail.com

1. Introduction

Malaysia is an upper-middle-income country with a per capita income of US$11,415 in 2019.[1] It is, thus, on the threshold of becoming a high-income country.[2] However, the COVID-19 pandemic in 2020 plunged the Malaysian economy into a recession in 2020. The Malaysian economy contracted by 5.6% in 2020.[3] A third wave of COVID-19 infections, which began in September 2020, dashed hopes for a quick and robust economic recovery in 2021.

The Malaysian economy will recover eventually, but its long-term growth prospects remain uncertain. This uncertainty can be attributed to structural changes in the Malaysian economy. More specifically, the Malaysian economy has been deindustrialising for the past 20 years. The manufacturing sector's contribution to the economy (gross domestic product; GDP) stood at 21.4% in 2019, down from a peak of 30.9% in 1999. As this has occurred before Malaysia could become a developed economy, it has undergone 'premature deindustrialisation'. A key driver of the country's premature deindustrialisation is likely to be a change in the country's participation in global value chains (GVCs). Thus far, scarcely any research has been undertaken to examine this phenomenon.

The goal of this study is to examine the role of GVC participation in Malaysia's premature deindustrialisation experience. This will be achieved in part by comparing the country's GVC participation in manufacturing during the industrialisation (1960–1999) and premature deindustrialisation (after 2000) periods.

The outline of this paper is as follows. Section 2 will review the literature on structural and premature deindustrialisation, including the role of GVCs. Section 3 examines Malaysia's experience in industrialisation and premature deindustrialisation. The country's industrial policies are examined in Section 4. The trends in Malaysia's participation in GVCs are discussed in Section 5. Section 6

[1] In current prices. Source: World Bank.
[2] The current definition of a high-income country is a country with a per capita income exceeding US$12,535. For World Bank's latest classification, see: https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2020-2021
[3] Bank Negara Malaysia, Economic and Financial Developments in Malaysia, Q4/2020, 11 February 2021.

concludes the paper by summarising some of the key findings and drawing some policy implications.

2. Literature review

The study of deindustrialisation can be situated within a broader framework of structural change. However, there are also specific lines of enquiries devoted specifically to deindustrialisation. The literature is thus reviewed along these lines – structural change and deindustrialisation.

2.1. Structural change

The term 'economic structure' can be interpreted to mean the relative importance of different types of economic activities (or sectors) in an economy. Structural change or structural transformation refers to the reallocation of economic activity across three broad sectors of the economy, namely, agriculture, industry, and services (Herrendorf et al., 2014).[4] A standard characterisation of structural change is to frame it in terms of shifts in the predominance of different sectors. One key structural change is *industrialisation*, which involves a shift in the relative importance of economic activities (in terms of output and employment) from agriculture to manufacturing (Syrquin, 1988). The process of structural change is complex, involving many dimensions such as demand, technology, employment, factor accumulation, migration, location, demography, income distribution and the environment.

[4] The more 'modern' studies of economic structure and structural change date from the 1930s following the Great Depression. The early pioneering works focused on the development of the data collection methods and tools such as national accounts (Simon Kuznets, Colin Clark, and Richard Stone) and input-output analysis (Wassily Leontief). The study of economic structure and structural change is not a recent endeavour. An early precursor was Quesnay's Tableau Économique (first published in 1758), which depicted the economy as comprising three classes c the proprietary class (landlord), productive class (farmer and farm labourer) and sterile class (artisan and foreign merchant). In a more dynamic and historical approach, Adam Smith – influenced by the ideas of Samuel Pufendorf and Francis Hutcheson – theorised that societies evolve through four stages, namely hunters, shepherds, agriculture, and commerce. See Okan (2017).

The theories and empirics of structural change have focused on a number of drivers.[5] From a domestic demand perspective, a rise in per capita real income is accompanied by a decline in the share of food in final demand and an increase in producer goods, machinery and social overhead (Chenery and Syrquin, 1986). Not only is there an increase in the production of manufactured goods with greater income elasticity, but a higher proportion of these goods are intermediate goods – which leads to greater inter-sectoral interactions and dependencies. Sectoral change is also driven by changes in the prices of manufactured goods relative to agricultural goods – which is brought about by differences in productivity growth.

For many countries, especially smaller countries with a relatively lower endowment of natural resources, the rise in the trade of manufactured goods is another characteristic of industrialisation (Syrquin, 1988; Syrquin and Chenery, 1989). Recent empirical work has also emphasised the importance of country-specific technological factors (Eberhardt and Teal, 2012).

2.2. Premature deindustrialisation

The process of industrialisation took centre stage in the analysis of structural change in the early years following the publication of Kuznet's pioneering work in 1966. In the same year, Kaldor's (1966, p.3) inaugural lecture described the deindustrialisation of the British economy in terms of having 'reached a high stage maturity earlier than others, with the result that it has exhausted the potential for fast growth before it had attained particularly high levels of productivity or real income per head'. He termed this state of affairs as 'premature maturity'. Thus, the notion of a 'mature point' was conceptualised in terms of an inflection point in the share of manufacturing in total employment. Beyond this point, the agriculture sector's employment would reach such a low level that any further reallocation of labour into services would have to come from the manufacturing sector.

In an early work, Singh (1977) also argued that deindustrialisation could be due to a decline in the competitiveness of manufactured exports. The drivers of deindustrialisation were further theorised and clarified in subsequent works. Rowthorn and Wells (1987) proposed three types of deindustrialisation, namely, (i)

[5] For a comprehensive review, see Herrendorf et al. (2014) and van Neuss (2019).

positive deindustrialisation – driven by rapid productivity growth in manufacturing and in which workers are reallocated to a vibrant service sector (ii) negative deindustrialisation, in which labour shed by the manufacturing sector is not absorbed by the services sector, and (iii) deindustrialisation induced by structural change in trade where net exports shifts away from manufactures towards other goods and services (Rowthorn and Wells, p.6). Thus, the weakening of manufactured exports is a driver of deindustrialisation. The authors also emphasised the importance of changes in the composition of demand, which shifts, first, from food (agriculture) towards manufactured goods, then towards services as income per capita rises. In a follow-up work, Rowthorn and Ramaswamy (1997, 1998) argued that amongst these drivers, trade was not deemed the key driver of deindustrialisation as it accounted for only one-fifth of deindustrialisation in the advanced economies.

The phenomenon of premature deindustrialisation in developing countries was highlighted by Dasgupta and Singh (2006). The authors showed that the turning point for the share of manufacturing output and employment had declined to a lower level of per capita income than experienced previously. This, they argued, could be either due to: (i) the growth of manufacturing employment in the formal sector, or (ii) countries industrialising based on their current comparative advantage (Washington consensus industrial policies) rather than the long-term dynamic comparative advantage (state-driven industrial policies).

Rodrik (2016) argued that premature deindustrialisation in developing countries is driven by globalisation and labour-saving technological progress in manufacturing. This takes the form of exposure to a decline in the relative price of manufactures due to technological progress in other countries, the rise of China, and domestic trade liberalisation. Here the decline in manufactures' relative prices in world markets exceeds the productivity growth differential between manufacturing and non-manufacturing.

More recent research on deindustrialisation has shifted towards micro-level analysis. Bernard et al. (2017) use microdata to show that deindustrialisation in advanced economies could involve two phenomena: (i) firms transiting from manufacturing to services, and (ii) continuing firms evolving into more service-like

enterprises. This micro-level approach has not been extended to the study of premature deindustrialisation in developing countries.

2.4. Premature deindustrialisation and global value chains

As discussed earlier, premature deindustrialisation has been linked to trade. It is, thus, not surprising that with the advent of GVCs, some attention began to be paid to the possible role of GVCs in premature deindustrialisation. In an early work indirectly related to this topic, Robert-Nicoud (2008) argued that offshoring can delay deindustrialisation by maintaining the comparative advantage of industrialised countries in complex or strategic functions. This implies that countries experiencing premature deindustrialisation are those unable to do this.

Stijepic (2011) also argued that offshoring can slow down the process of deindustrialisation, albeit through a different process. Offshoring enhances the productivity of the manufacturing sector, which drives the reallocation of labour from consumption goods production to investment goods production.

In a more recent paper, Sumner (2019) argued that premature deindustrialisation is related to GVCs through three channels, namely: (i) trade liberalisation and the decline in relative prices of manufactured goods; (ii) developing countries being stuck in low value-added sections of GVCs; and (iii) spreading and thinning out of manufacturing activities across increasingly large numbers of developing countries. Finally, a lack of institutions that could support the upgrading of GVC engagement could be the reason why a country engaged with GVCs could deindustrialise prematurely. Sumner (2019) argued that such institutions support contract completeness, lower administrative burden, business friendliness, stable policies, and labour market-enhancing outcomes for workers. In this regard, the World Bank (2020) provides a broad list of institutions that are important for upgrading GVC participation. These include institutions for governance, standards certification, contracts, and intellectual property rights.

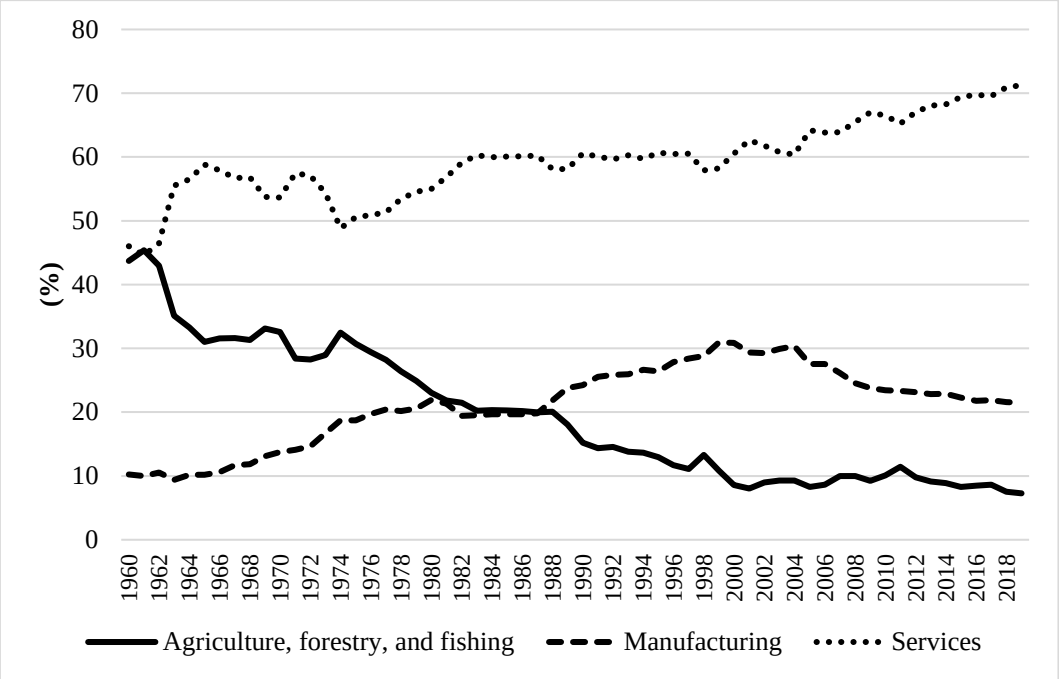
3. Structural change in the Malaysian economy

Structural change at the broad level

Malaysia's experience in the structural change of its economy is similar to those experienced by many countries that have undergone the process of industrialisation and deindustrialisation. There are several distinct phases or stages in the trajectory of the structural change. In the first phase, covering the period from the late 19th century until the 1960s, the primary sector (agriculture, rubber and mining, tin) predominated the economy. From the 1960s onwards, agriculture's role in the Malaysian economy – in terms of GDP share – began to decline continuously from 45% in 1961 to 7% in 2019 (Figure 1). In the second phase, which covers the period from the 1960s until 1999, the manufacturing sector's share of GDP increased. In the third phase (1999 until today), the relative contribution of the manufacturing sector began to decline. This is the deindustrialisation phase. Malaysia's deindustrialisation can be regarded as 'premature' as it has occurred at a per capita income level that is considerably lower than that experienced by developed nations in the past (Rasiah, 2011a; Tan, 2014).

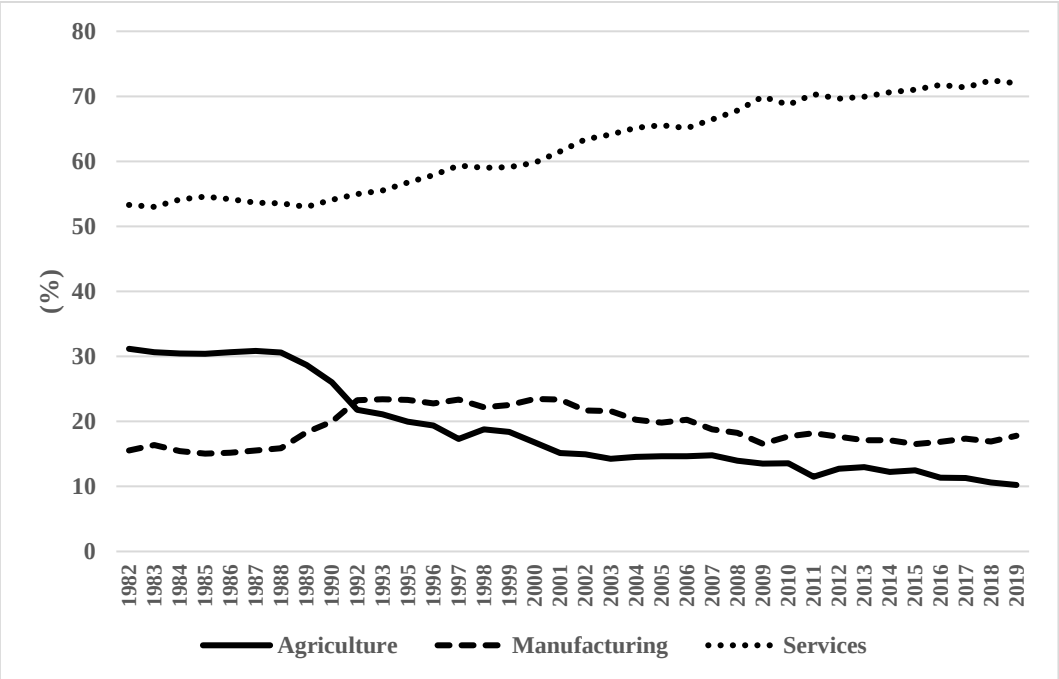
Another often-used measure of structural change is the sectoral composition of total employment. The available data suggest that the manufacturing sector's share of total employment reached a plateau of 23% at around 1992 and began declining since 2001 to reach a low of 16% in 2009 (Figure 2). Thereafter, it fluctuated at around 16%–18%. Thus, the employment data also indicate that Malaysia has been experiencing deindustrialisation since the 1990s, although the relative decline of manufacturing has been less drastic compared to what is suggested by the sectoral GDP data.

Figure 1: Sectoral Composition of GDP



Source: World Bank. https://data.worldbank.org/indicator/ (accessed 20 November 2020).

Figure 2: Sectoral Composition of Employment

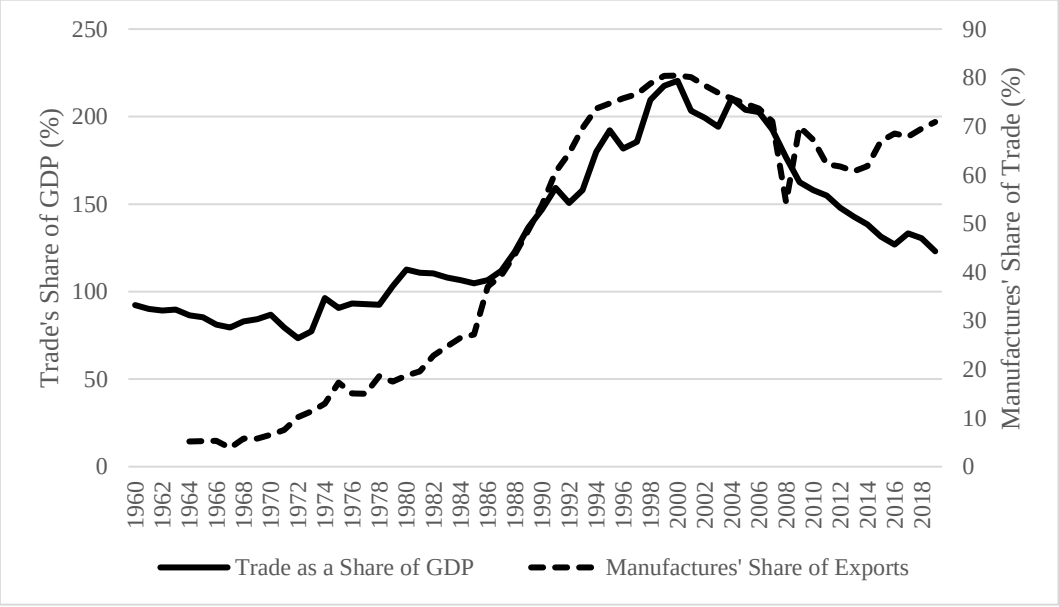


Source: World Bank. https://data.worldbank.org/indicator/ (accessed 20 November 2020).

Structural change in manufactured trade

Given that much of Malaysia's manufactured products are exported, the relative decline in manufacturing is also reflected in the decline observed in the share of manufactures in total merchandise exports and in the trade's share of GDP (Figure 3). The country's manufactures' share of total exports peaked at 80% in 2000. Although this share increased after 2013, the level remains below 70%. The decline in the country's trade ratio is starker – having increased since the 1970s before declining from a peak of 217% in 1999 to 123% in 2019. At the sectoral level, exports as a share of manufacturing value-added declined from a peak of 80% in 1999 to 54% in 2008 (the trend has reversed slightly since then but has remained below the peak).

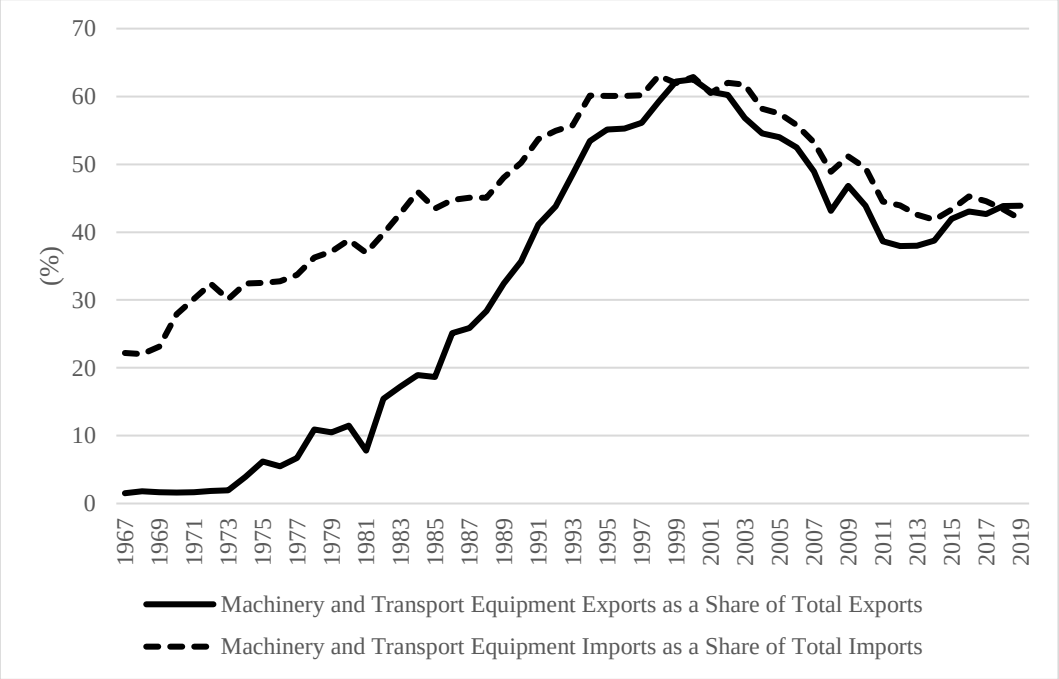
Figure 3: Trade's Share of GDP and Manufactures' Share



Source: World Bank. https://data.worldbank.org/indicator/ (accessed 20 November 2020).

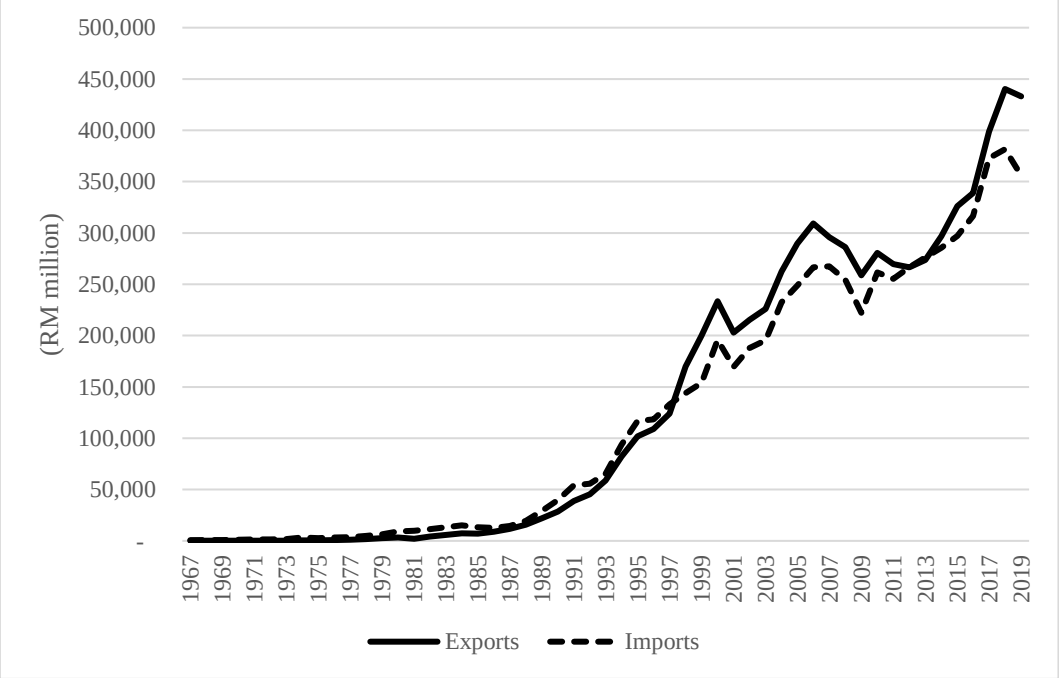
A key component of the relative decline in the manufacturing sector in Malaysia has been the relative decline in the exports of machinery and transport equipment (Figure 4). At their peak in 1998, machinery and transport equipment exports accounted for 63% of Malaysia's total exports but declined thereafter to a low of 38% in 2012. The industry's share of exports has since recovered only slightly, reaching 44% in 2019. In terms of the volume of exports and imports of machinery and transport equipment, there was a decline in the total value of machinery and transport equipment between 2006 and 2009 (Figure 5).

Figure 4: Share of Machinery and Transport Equipment in Total Exports and Total Imports



Source: Department of Statistics, Malaysia.

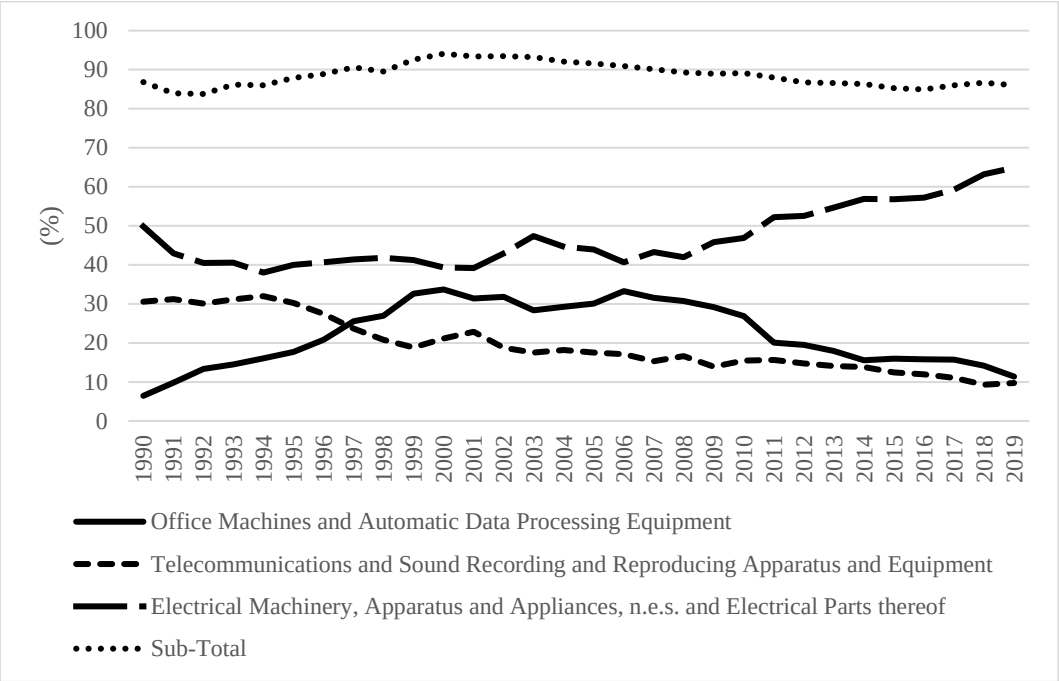
Figure 5: Value of Exports and Imports of Machinery and Transport Equipment



Source: Department of Statistics, Malaysia.

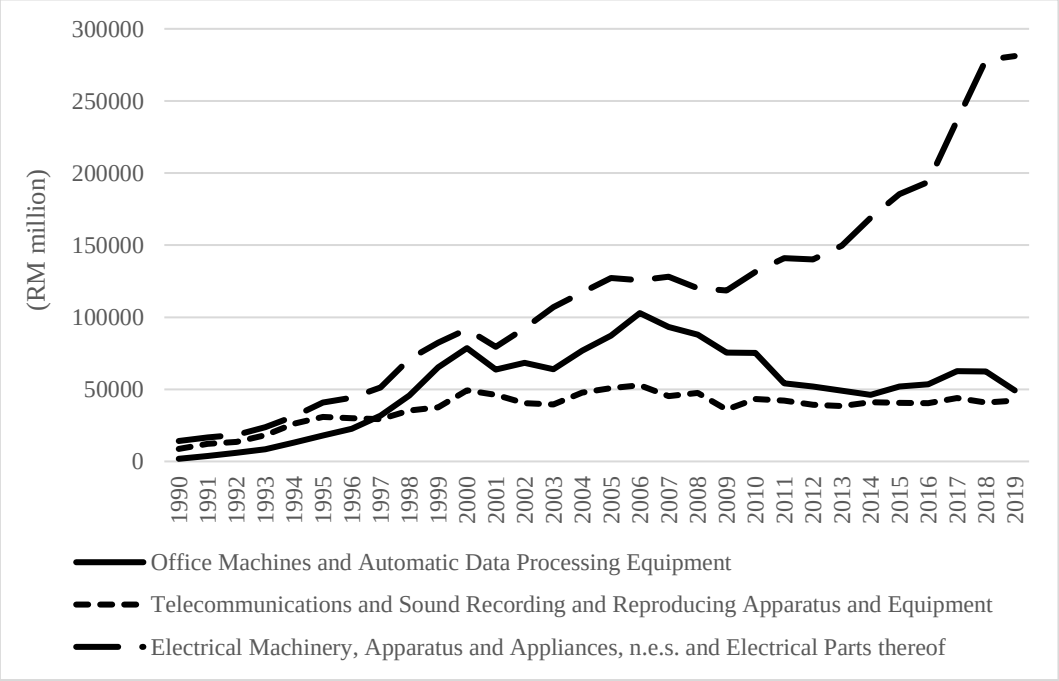
Within the machinery and transport industry (SITC-1 Code 7), three sub-industries dominate, namely: (i) office machines and automatic data processing equipment [SITC-2 code 75]; (ii) telecommunications and sound recording and reproducing apparatus and equipment [76]; and (iii) electrical machinery, apparatus and appliances, n.e.s. and electrical parts thereof [77]. These three sub-industries account for 86%–94% of exports from the machinery and equipment industry (Figure 6). However, the export share of electrical machinery, apparatus, and appliances has clearly increased from 41% in 2006 to 66% in 2020. In contrast, the shares of each of the other two sub-industries have declined to about 10%. The total value of exports from the office machines and automatic data processing equipment industry has declined since 2006 (Figure 7). About 80% of the exports from the electrical machinery, apparatus, and appliances industry (77) comes from one industry, namely: thermionic valves and tubes, and photocells, etc. (SITC-3 Code 776).

Figure 6: Share of Key Industries in Machinery and Transport Equipment Exports



Source: Department of Statistics, Malaysia.

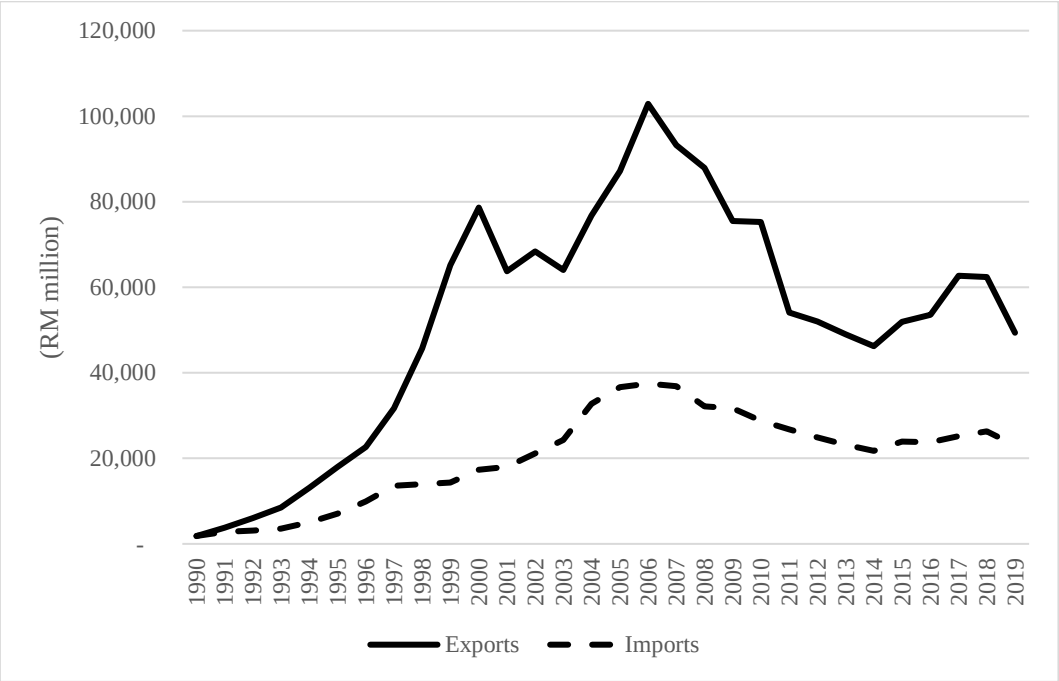
Figure 7: Total Exports of Key Machinery and Transport Equipment Industries



Source: Department of Statistics, Malaysia.

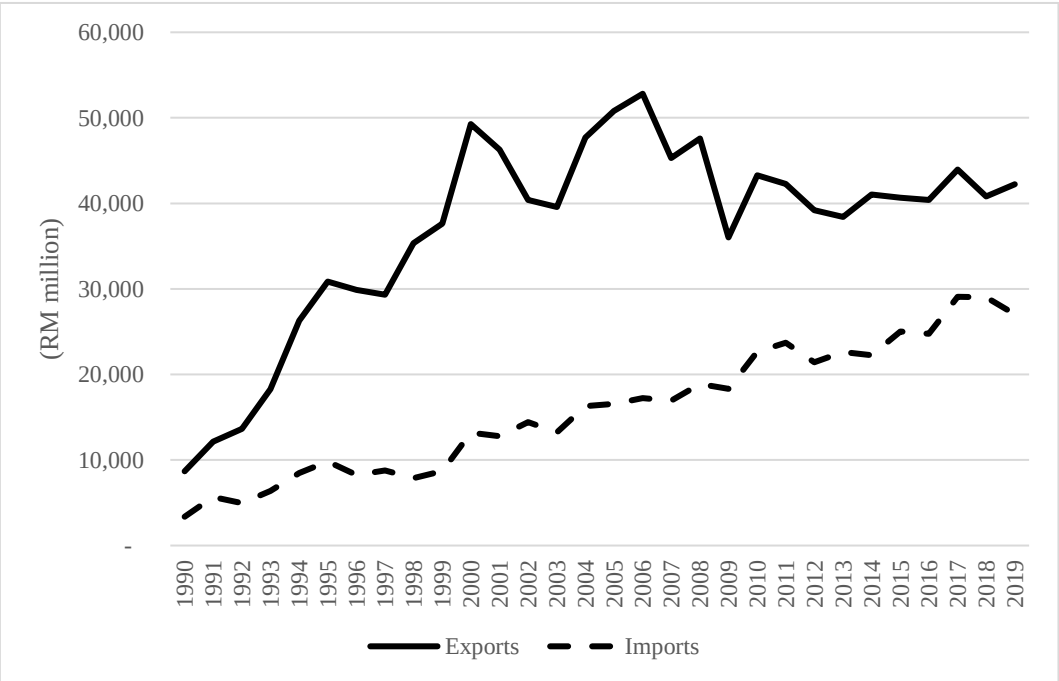
A potential source of structural change in Malaysia's machinery and transport equipment industry is the country's participation in GVCs. Participation in GVCs entails integrating production vertically with an upstream-downstream supply chain that is fragmented across a few countries. An analysis of the trends within the three key sub-industries could provide useful insights. For the office machines and automatic data processing equipment industry [SITC 75], the decline in exports after 2006 was also accompanied by a decline in imports with the gap between the two narrowing (Figure 8). In the case of the telecommunications and sound recording and reproducing apparatus and equipment industry [SITC 76], exports first declined (2006–2012) and stabilised thereafter (2007–2019) (Figure 9). However, imports continue to increase over time – resulting in a higher import/export ratio. The exports-imports trend for the electrical machinery, apparatus, and appliances industry (SITC 77) is quite different (Figure 10). From 1990 to 2010, the value of imports exceeded exports in this industry. However, since 2010, not only have exports exceeded imports, but the gap between the two has widened. Insofar as global GVCs are important in the machinery and transport equipment industry, the changes in exports and imports trends in this industry could reflect changes in the country's participation in GVCs.

Figure 8: Office Machines and Automatic Data Processing Equipment (SITC 75) – Exports and Imports



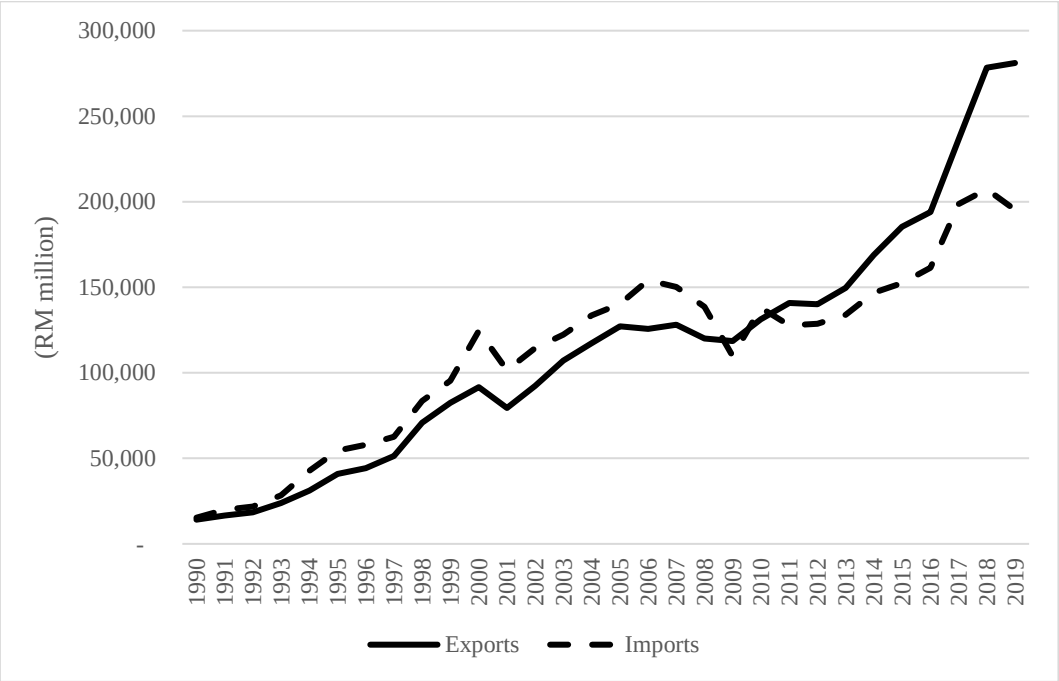
Source: Department of Statistics, Malaysia.

Figure 9: Telecommunications and Sound Recording and Reproducing Apparatus and Equipment (SITC 76) – Exports and Imports



Source: Department of Statistics, Malaysia.

Figure 10: Electrical Machinery, Apparatus and Appliances (SITC 77) – Exports and Imports

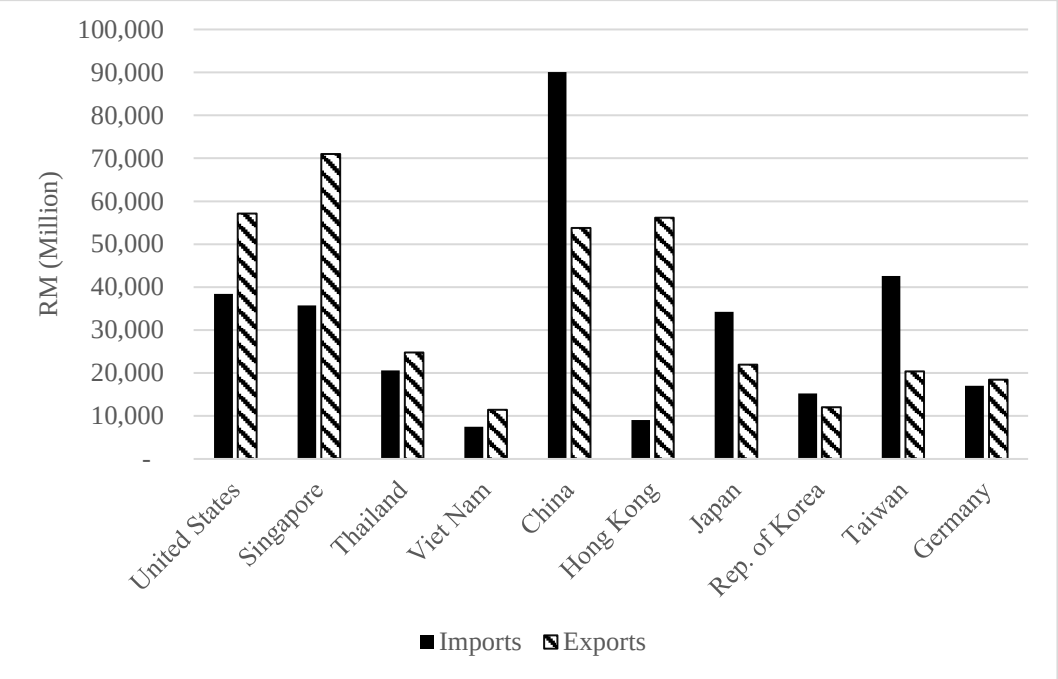


Source: Department of Statistics, Malaysia.

For the two industries – SITC 75 and SITC 76 – that have experienced a decline in exports, it could indicate that production fragmentation could have shifted the production of some components from Malaysia to other countries. The experience of the electrical machinery, apparatus, and appliances industry (SITC 77) could be the reverse – more electronic components are now produced within Malaysia and exported rather than being incorporated into the final goods exports of other countries.

The changes in the manufacturing trade structure are also reflected in bilateral imports and exports. Ten countries account for 87% and 80% of Malaysia's imports and exports of machinery and equipment, respectively (Figure 11). The trade balance in this industry differs across countries. The largest source of imports in 2019 was China – Malaysia has a substantial trade deficit in this industry. Malaysia has a substantial surplus in machinery and equipment trade with the United States, Singapore, and Hong Kong.

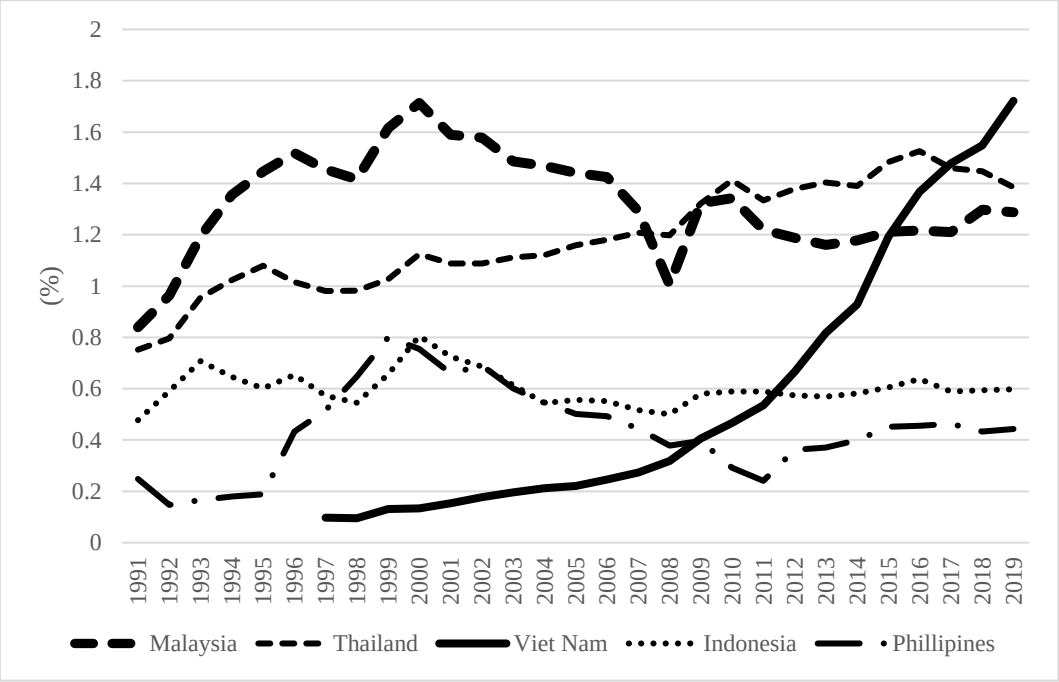
Figure 11: Malaysia's Machinery and Equipment Exports and Imports, 2019



Source: Department of Statistics, Malaysia.

Finally, the structural changes experienced by Malaysia's manufacturing sector have brought about a long-term decline in the country's export competitiveness in manufacturing. This can be seen in the decline in Malaysia's share of global manufacturing exports from a peak of 1.7% in 2000 to 1% in 2008 (during the global financial crisis) (Figure 12). Although its share has recovered a bit since then, its share has plateaued at around 1.2%–1.3%.

Figure 12: Country Share of Global Manufacturing Exports



Source: World Bank. https://data.worldbank.org/indicator/ (accessed 20 November 2020).

4. Industrial policies and premature deindustrialisation

Industrial policies have played an important role in Malaysia's industrialisation experience since the country's independence in 1957 (Table 1). The early focus in the period from the late 1950s to the late 1960s was on import substitution that emphasised the development of light manufacturing industries that produced goods for the domestic market. Starting from the late 1960s and early 1970s, the country began implementing an export promotion strategy. However, in the early 1980s, the Mahathir administration (1981–2003) began introducing a second phase of import substitution that promoted heavy industries, such as automotive, steel, and cement. However, the economic crisis in the mid-1980s brought about a renewed emphasis on export promotion. This second round of export promotion aimed at moving up the value chain through deepening technological development and industrial clusters. This export promotion strategy ran concurrently with the development of heavy industries. The latter continued to be supported by the government well into the 2010s but more or less ended

unravelled with closure (Perwaja Steel in 2013) and equity divestiture (sale of 49.9% equity of DRB-HICOM to Zhejiang Geely Holding Group in 2017).

Table 1: Industrial Policies in Malaysia

Policy	Period	Policy Focus	Policy Plans and Instruments
Import Substitution 1	1958–1968	• Consumer goods industries – for the domestic market	• Pioneer Industries Ordinance, 1958 • Tariff protection
Export Promotion 1	1968–1980	• Manufactured exports • Foreign direct investment in manufacturing	• Investment Incentives Act, 1968 • Free Trade Zone Act, 1971
Import Substitution 2	1980–2000s	• Heavy industries – automotive, steel, and cement	• Heavy Industries Corporation of Malaysia, 1980 • Selective tariffs and quotas
Export Promotion 2	1985–2010	• Twelve resource-based and non-resource- based industries (1980s) • Clusters (1990s) • Technological deepening (1990s and 2000s)	• Industrial Master Plan 1, 1986 • Promotion of Investment Act, 1986 • Action Plan for Industrial Technology Development, 1990 • Industrial Masterplan 2, 1990 • Malaysian Technology Development Corporation, 1992 • Human Resource Development Act, 1992 • Malaysia Industry-Government Group for High Technology, 1993

			• Industrial Masterplan 3, 2006 • New Economic Model, 2010 • 10th Malaysia Plan 2011–2015 • 11th Malaysia Plan 2016–2020
Multimedia Super Corridor	1996–	• Multimedia technology industry	• Multimedia Development Corporation • Cyberjaya
Growth clusters and corridors	2010s	• Creative industries (Southern) • Automotive and aeronautics sectors (Northern) • Petrochemical sector (Eastern) • Tourism and palm oil processing (Sabah) • Aluminium, steel, and glass (Sarawak)	• Iskandar Malaysia • Northern Corridor Economic Region • East Coast Economic Region • Sabah Development Corridor • Sarawak Corridor of Renewable Energy • New Economic Model, 2010 • 10th Malaysia Plan 2011–2015 • 11th Malaysia Plan 2016–2020
Strengthening manufacturing and exporting	2020s	• Electronic and electrical • Chemical • Machinery and equipment • Aerospace	• 12th Malaysia Plan 2021–2025 • National Policy on Industry 4.0 (4WRD) • National Trade Blueprint

Source: Rasiah (2011b), Jomo (2007) and updated by the author.

Malaysia's manufacturing sector began experiencing a relative decline starting in 1999/2000. However, serious concern (as documented in official plans) about the sector only began emerging around 2010. The New Economic Model, an economic policy framework introduced in March 2010, highlighted the weaknesses of the electronic and electrical sector (E&E) as well as foreign direct investment. The term 'premature exit' was used to describe the possibility of losing industries that could potentially drive manufacturing's future development.

In the 10th Malaysia Plan 2011–2015 (10MP), which launched in June 2010, a new development strategy – the Economic Transformation Programme (ETP) – was introduced as a strategy to overcome these problems. The ETP, which was further elaborated in a more detailed policy document launched in September 2010, contains 12 National Key Economic Areas (NKEAs) that will be the key growth engines.

The E&E sector was one of the NKEAs, and four industries were targeted, namely: (1) semiconductors, (2) solar, (3) light-emitting diodes, (4) industrial electronics, and (5) electrical home appliances. The goal for the E&E sector is to move up the value chain through policies aimed at upskilling workers, strengthening the R&D ecosystem, and strengthening linkages to domestic suppliers (e.g. the vendor system).

The ETP also envisioned implementation through several entry point projects (EPPs). For example, the EPPs for semiconductors were: (i) executing a smart follower strategy for mature technology fabrication; (ii) developing assembly and testing using advanced packaging technology; (iii) developing integrated circuit design firms; and (iv) supporting the growth of substrate manufacturers and related industries.

The declining competitiveness of Malaysia's manufacturing sector is also acknowledged in the 11th Malaysia Plan 2016–2020 (11MP), especially in the strategy paper (number 19). For the 11MP, a framework comprising five strategies was formulated to re-energise the sector (Table 2). These strategies include upgrading products, improving productivity, stimulating innovation, strengthening growth enablers, and increasing internationalisation. Three manufacturing

subsectors were targeted, namely: (1) chemicals, (2) electrical and electronics, and (3) machinery and equipment.

In October 2018, the National Policy on Industry 4.0 (4WRD) was launched to transform the manufacturing industry by harnessing new technologies associated with the Fourth Industrial Revolution. These technologies include the Internet of Things, artificial intelligence, additive manufacturing, and sensor fusion. The application of these technologies is expected to modernise and digitalise operations and processes in the sector. The expected outcomes include greater productivity, more innovation, and more skilled workers.

Table 2: Strategic Framework for Manufacturing under the 11th Malaysia Plan

Strategy	Action
B1: Moving towards complex and diverse products	• Incentivise pioneers in catalytic subsectors to promote the development of frontier products • Enhancing collaboration between SMEs and MNCs • Develop workforce skills and capabilities in producing frontier products
B2: Enhancing productivity through automation	• Promote automation to reduce reliance on unskilled foreign workers • Enhance industry-led training for local workforce skills development
B3: Stimulating innovation-led growth	• Leveraging intermediaries to increase R&D and innovation activities • Promoting IP registration, sharing and protection • Adopting Life Cycle Assessment • Increasing environmental compliance
B4: Strengthening growth enablers	• Increasing access to financing • Introducing targeted and performance-based incentives with an exit policy • Enhancing logistics and infrastructure support • Strengthening Industrial Estate management
B5: Ramping up internationalisation	• Intensifying export promotion via National Export Council • Increasing compliance to standards • Leveraging AEC and FTAs • Leveraging industry associations for greater market access

Source: 11th Malaysia Plan, Government of Malaysia.

The E&E industry continued to be important in the recent five-year plan, the 12th Malaysia Plan 2021–2025 (12MP). In addition to E&E, seven other industries have been identified as strategic and having a high impact. They include global services, aerospace, creative, tourism, halal, smart farming, and biomass. Other important industries include shipbuilding, pharmaceutical, and medical devices.

The 12MP also addressed the country's GVC participation explicitly. The document also noted that the combination of high GVC backward participation and low GVC forward participation meant that the country gained little from GVC participation. Thus, the country will try to transform its manufacturing activities towards higher value-added activities and, at the same time, increase locally produced inputs (reduce import content). This will be achieved through improving the country's manufacturing ecosystems, promoting the adoption of new technology, and enhancing the talent base and R&D as well as design and development (D&D) activities.

The implementation of 4WRD in the manufacturing sector is also expected to help the sector move up the value chain. Incentives will also be given to link SMEs with foreign enterprises to enhance the former's participation in GVCs.

The National Trade Blueprint (NTBp) was launched in November 2021 to improve the competitiveness of Malaysia's exports by focusing on four priority areas, namely: (1) increase exporting companies, (2) increase high-value export goods, (3) diversify export products, and (4) improve the export ecosystem. The strategies adopted will emphasise the export ecosystem, export capabilities, e-commerce, market access, branding and promotion, investment and export diversification, investments, and sustainability.

Overall, Malaysia has been slow to respond to the country's declining export competitiveness in the manufacturing sector. The key policy foci have been on upgrading value-added and export diversification. There have been some limited detailed policy discussions on the state of GVC participation and policy concerns. More recent economic policies, such as the 12 MP and NTBp, have begun to address this problem.

5. Malaysia's participation in global value chains

5.1. Global value chains: Definition and measurement

Antras (2020, p.553) defines a GVC as consisting of 'a series of stages involved in producing a product or service that is sold to consumers, with each stage adding value, and with at least two stages being produced in different countries. A firm participates in a GVC if it produces at least one stage in a GVC.'[6] An important characteristic of GVCs is the structure of the production networks. Elements of these networks include spider-like structures (with inputs that are simultaneously sourced from different countries) or snake-like structures (in which value is added sequentially).[7] The goal of measuring a GVC is to identify and quantify the distribution of value added at the different stages of production across different countries.

A measure of GVC-related trade is the share of total trade that flows through at least two borders (Borin and Mancini, 2019). These two highly aggregated measures of GVC participation are defined by the World Trade Organization in the following manner:[8]

- **Backward GVC participation** – the ratio of the foreign value-added content of exports to the economy's total gross exports
- **Forward GVC participation** – the ratio of the domestic value-added sent to third economies to the economy's total gross exports

These two measures are used to characterise the position of a country's GVC participation. The factor endowment of a country will affect its GVC position. Countries that are more abundant with physical capital and skilled labour tend to have higher levels of forward GVC participation and lower levels of backward GVC participation (World Bank, 2020).

It is technically difficult to measure GVCs using trade statistics because these statistics capture trade flows that cross through only one border. It is for this reason that input-output data is often used to measure GVC participation. Several sources

[6] The boundaries between production and post-production can be blurry. Some manufactures prefer to lease out their products rather them sell them outright.
[7] See Baldwin and Venables (2013).
[8] See: https://www.wto.org/english/res_e/statis_e/miwi_e/explanatory_notes_e.pdf

of data are often used for international comparisons of GVC. They include the World Input-Output Database (WIOD, 2000–2014), Trade in Value Added (TiVA, 2005–2015), and the UNCTAD-Eora Global Value Chain database (Eora, 1990–2017). Malaysia is only covered in the TiVA and Eora databases. The TiVA data are used for this study.

5.2. Global evolution of GVCs

An analysis of Malaysia's participation requires some understanding of the evolution of GVCs. GVC trade grew very rapidly in the 1990s and 2000s (World Bank, 2020). However, this trend began to reverse after the global financial crisis in 2008. The decline has been attributed to lower growth and a decrease in trade-to-income elasticity (World Bank, 2020). The latter has been attributed to more countries 'internalising' a larger range of the value chain. As a result, almost all major exporters of electrical and electronic goods experienced a decline in the share of intermediate imports.

GVC participation varies across countries and time. The GVC positions of some countries have declined, whilst others have increased. These changes are related to geographical proximity and trade agreements (Johnson and Noguera, 2017). Another important feature is the length of the GVC measured by the number of production stages across countries. In general, there has been an overall increase in the length of GVCs (De Backer and Miroudot, 2013). The centrality of GVC networks has also changed. The centrality of Japanese industries in Asia's GVC networks has declined (Criscuolo and Timmis, 2018). These changes have important implications for Malaysia's participation in GVCs.

5.3. Macro evidence

GVC participation

Malaysia's overall backward GVC participation – which is defined as foreign value-added as a share of gross exports – has declined consistently, from 45% in 2005 to 37% in 2015 (Figure 13). This is quite different from the experiences of other industrialised and industrialising countries in Asia. These other countries increased their backward GVC participation during the period 2009–2013 (Table 3). Malaysia's overall forward GVC participation – which is defined as the ratio of

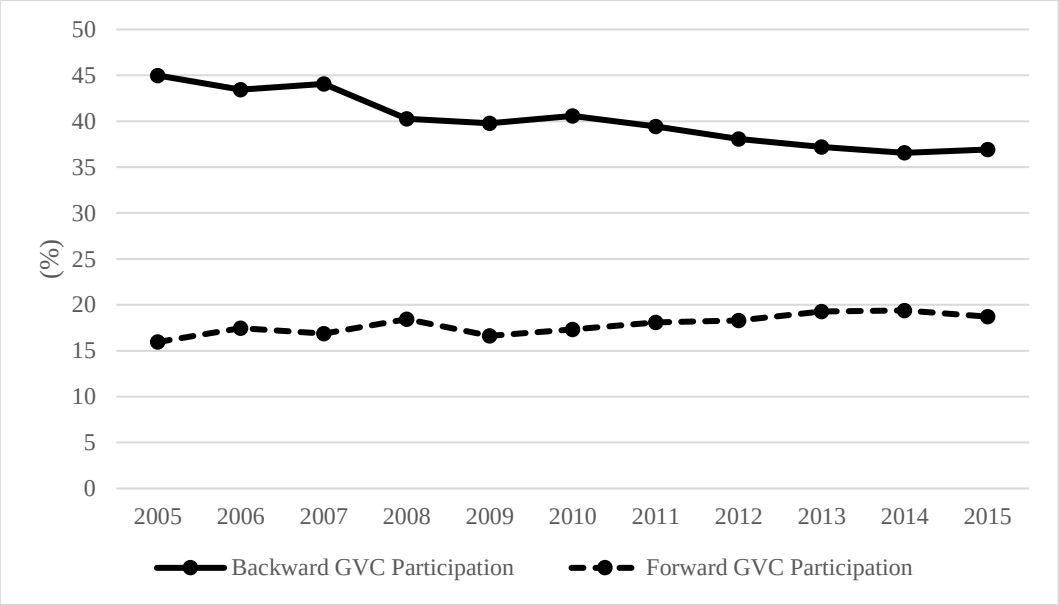
Malaysia's domestic value-added sent to third economies to the economy's total gross exports – remained more or less stable during the period 2005–2015, fluctuating between 16% and 19%.

However, the interpretation of such highly aggregated measures can be problematic as they cover very diverse industries and sectors. Besides manufacturing, exports of resource-based industries are also important. Such industries are different from manufacturing. Thus, it would be useful to examine GVC participation at a more disaggregated level, for example, for the manufacturing sector and industries within the sector.

A more detailed look at the experience of the manufacturing sector indicates that the decline in backward GVC participation was prevalent across almost all the manufacturing industries (Table 4). The machinery and equipment industry had, on average, the highest degree of backward GVC participation across all industries. However, the computer, electronic, and optical products industry experienced a 12% decline in backward GVC participation during the 2005–2016 period. The decline in backward GVC participation reflects an increase in the contribution of domestic value-added in exports, which is a positive contribution to industrialisation in terms of developing domestic manufacturing capability. However, this has occurred amidst a decline in exports' share in GDP leading to deindustrialisation (declining share of manufacturing in GDP). Another possible explanation is that a significant proportion of domestic value-added in gross exports comes from the non-manufacturing sector, such as the agriculture and services sectors. In this case, an increase in domestic value-added would be consistent with deindustrialisation.[9]

[9] The author thanks Professor Urata for pointing this out.

Figure 13: Backward and Forward GVC Participation



Source: Trade in Value Added, Organisation for Economic Co-operation and Development.

Table 3: Backward GVC Participation in Selected Countries (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Indonesia	18.4	14.9	14.3	15.0	12.1	12.5	12.8	13.3	13.9	14.1	12.9
Malaysia	45.0	43.4	44.1	40.3	39.8	40.6	39.4	38.1	37.2	36.6	36.9
Philippines	26.3	31.7	24.2	24.8	21.9	23.9	23.5	23.9	21.0	20.4	22.0
Singapore	42.8	44.6	41.4	45.2	42.0	41.3	43.5	43.8	42.8	43.0	40.9
Thailand	38.4	37.1	36.1	39.0	34.4	36.0	38.8	38.4	37.5	36.7	33.6
Viet Nam	36.1	38.1	40.8	41.5	37.2	40.5	41.8	40.8	41.7	42.4	44.5
Japan	10.2	12.2	13.2	15.2	10.9	12.2	14.3	13.9	15.2	15.8	13.2
Rep. of Korea	32.7	34.2	34.4	41.2	37.1	38.2	42.4	42.0	39.5	37.3	32.6
China	26.3	25.9	24.8	23.0	19.5	21.1	21.7	20.8	20.3	19.5	17.3
India	18.8	20.6	20.7	24.5	21.8	23.6	25.1	25.1	24.8	23.0	19.1
United Kingdom	14.3	15.0	14.9	16.6	15.9	17.5	18.8	18.8	18.0	16.3	15.1
United States	10.8	11.4	11.7	12.9	9.4	11.1	12.7	12.4	11.5	11.2	9.5
European Union	10.4	11.6	11.8	12.7	10.8	12.8	14.0	14.3	13.5	12.9	12.2
OECD	6.4	7.4	7.6	9.1	7.2	8.5	10.0	10.0	9.5	9.1	7.9

OECD = Organisation for Economic Co-operation and Development.
Source: Trade in Value Added, OECD.

Table 4: Malaysia – Foreign Value-Added Share of Gross Exports (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Computer, electronic, and optical products	66.5	63.5	64.7	61.6	61.9	62.1	60.9	58.6	57.2	56.5	56.0	55.0
Motor vehicles, trailers, and semi-trailers	62.9	60.7	62.2	62.4	56.9	61.2	60.3	59.3	58.3	56.8	56.2	55.6
Electrical equipment	57.1	58.2	59.0	58.8	54.9	57.2	56.5	55.3	55.2	53.8	54.0	51.9
Manufacturing	54.2	52.1	52.9	49.1	48.4	49.7	48.5	46.6	45.5	44.8	44.6	43.1
Other transport equipment	54.0	56.9	58.7	56.2	56.7	58.7	55.2	54.2	53.2	51.3	50.2	49.7
Fabricated metal products	52.1	52.3	54.2	55.2	48.7	52.2	52.6	50.8	50.9	49.3	48.6	46.2
Machinery and equipment, nec	50.9	47.3	48.0	48.5	44.7	48.7	46.9	46.0	45.5	44.5	44.1	43.6
Basic metals	44.9	49.8	52.3	54.4	47.0	51.4	53.1	51.0	51.5	49.2	49.7	46.4
Other manufacturing; repair and installation of machinery and equipment	44.3	46.2	48.0	49.1	42.2	38.9	42.4	37.2	36.6	35.6	34.9	34.0
Rubber and plastic products	43.6	48.9	50.1	50.2	44.8	47.6	48.7	47.2	46.2	45.8	45.2	43.8
Textiles, wearing apparel, leather, and related products	37.7	34.9	35.8	35.2	31.5	36.5	35.1	33.7	33.4	32.8	35.1	35.3
Chemicals and pharmaceutical products	36.7	39.2	40.4	42.2	35.5	38.9	40.4	39.7	39.3	38.7	36.5	35.2
Paper products and printing	29.5	31.2	31.8	31.5	28.2	30.1	30.1	29.1	28.4	27.7	27.0	26.6
Food products, beverages, and tobacco	29.1	27.5	29.6	31.2	28.3	30.9	33.0	31.1	29.1	28.0	27.6	26.7
Coke and refined petroleum products	28.8	29.0	29.3	32.8	23.3	27.3	29.9	30.5	29.3	28.6	22.1	19.2
Other non-metallic mineral products	27.1	32.2	33.0	34.6	30.3	32.4	33.3	32.5	32.3	31.1	30.8	29.8
Wood and products of wood and cork	21.2	23.1	23.5	23.6	20.6	21.4	22.1	21.2	20.5	20.1	19.5	18.5

Source: Trade in Value Added, Organisation for Economic Co-operation and Development.

Some have argued that the relative decline in manufacturing (in terms of the shares of GDP and employment) could be due to the services sector – either through the outsourcing of services inputs or/and through manufacturing firms engaging in producing services. Based on input-output data, there is no evidence that services inputs into manufacturing have increased. The reverse has happened in many industries. The foreign services value-added share of exports – the equivalent of a 'backward GVC participation for services' – has declined for most manufacturing industries (Table 5). Thus, Malaysia's reduction in GVC participation has two dimensions – one through manufacturing and the other through services.

Table 5: Malaysia – Foreign Services Value-Added Share in Gross Exports (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Food products, beverages, and tobacco	11.1	10.6	11.2	11.3	10.6	11.3	11.8	11.3	10.9	10.6	10.9	11.0
Textiles, wearing apparel, leather, and related products	16.1	15.0	15.3	14.6	13.6	15.2	14.4	13.8	13.8	13.6	14.8	14.7
Wood and products of wood and cork	8.9	9.8	9.8	9.4	8.6	8.6	8.8	8.5	8.3	8.1	8.3	8.1
Paper products and printing	12.6	13.4	13.4	12.8	12.0	12.4	12.3	12.0	11.8	11.6	11.8	11.8
Coke and refined petroleum products	9.6	9.2	9.0	9.5	7.5	8.4	8.9	9.1	9.2	8.8	8.0	7.6
Chemicals and pharmaceutical products	14.7	15.5	15.8	15.6	14.1	14.8	15.0	14.7	14.7	14.5	14.6	14.6
Rubber and plastic products	17.9	20.2	20.3	19.6	18.2	18.7	18.7	18.1	17.9	17.8	18.3	18.1
Other non-metallic mineral products	11.7	13.8	13.9	13.6	12.7	13.0	13.2	12.9	12.9	12.4	12.9	12.8
Basic metals	16.3	17.6	18.1	18.2	16.4	17.0	17.2	17.3	18.0	17.8	18.4	17.5
Fabricated metal products	19.3	19.1	19.3	19.3	17.9	18.1	18.4	18.2	18.4	18.3	18.5	17.9
Computer, electronic, and optical products	26.8	25.6	25.9	24.6	24.6	24.5	24.9	23.6	22.8	22.9	23.2	22.8
Electrical equipment	21.8	22.0	22.0	21.7	20.7	20.8	20.8	20.5	20.6	20.7	21.1	20.3
Machinery and equipment, nec	20.0	18.4	18.2	18.1	17.3	17.9	17.5	17.4	17.3	17.2	17.3	17.1
Motor vehicles, trailers, and semi-trailers	24.7	24.0	24.1	23.7	22.5	23.0	22.9	22.5	22.3	22.0	22.0	21.9
Other transport equipment	20.3	20.8	21.0	20.9	21.4	21.2	20.4	20.3	20.5	20.0	19.6	19.7
Other manufacturing; repair and installation of machinery and equipment	17.8	18.3	18.6	18.6	16.8	14.8	16.2	14.5	14.3	14.1	14.2	14.1
Manufacturing	21.5	20.6	20.7	18.6	18.9	19.0	18.6	17.8	17.4	17.4	18.0	17.6

Source: Trade in Value Added, Organisation for Economic Co-operation and Development.

GVC position

Aside from GVC participation, it is also useful to examine the country's GVC position in terms of whether it is specialising in upstream or downstream activities. The GVC position index suggested by Koopman et al. (2010) measures this. If a country focuses mostly on upstream production (initial stages), its forward GVC participation will be relatively higher than its backward GVC participation, and vice versa. Between 1995 and 2008, Malaysia's GVC position moved towards higher forward participation relative to backward participation (WTO, 2014). This suggests that there was some upgrading in the country's GVC position during this period.

The GVC position can also be analysed using the GVC Journey Diagram based on the empirical comparative advantage index (ECA), which measures the comparative advantage of a country in trade in parts and components versus trade in final goods (Kimura and Obashi, 2010). Recent estimates by Obashi (2021) suggest that Malaysia's position has shifted towards a strengthening of the domestic industrial base of parts suppliers in the computer, electronic, optical products and electrical machinery industries during the 2001-2018 period. However, there are also indications that it has become less attractive for assembly offshoring (Obashi, 2021).

Manufacturing exports growth and GVCs

The GVC contribution to manufacturing exports growth can be examined by decomposing gross export growth (EXGR) into several components: the domestic direct value-added component (EXGRDD), domestic indirect value-added component (EXGRDI), and foreign value-added component (EXGRF) (Taglioni and Winkler 2016, p.117). The panel-data econometric specification for industry *i* at time *t* is modelled as follows:

$$D.lnEXGR_{it} = \alpha_0 + \alpha_{1t} D.lnEXGRDD_{it} + \alpha_2 D.lnEXGRDI_{it} + \alpha_3 D.lnEXGRF_{it} + \varepsilon_{it} \quad (1)$$

Industry-level data at the 2-digit level based on input-output tables from TiVA (OECD) are used. The data cover the period 2006–2015. GVC participation is captured through the EXGRF variable, which proxies backward GVC participation. The summary statistics of the data are provided in Table 6. There are 160 observations in the panel data. The average size of the foreign value-added component is slightly less than half of the size of gross exports. The variations across industries are significant for all the variables.

Table 6: Summary Statistics for Gross Exports and Input Components

Variable	Obs	Mean	Std. Dev.	Min	Max
EXGR	160	9159.731	14081.23	693.5	67974.8
EXGRDD	160	2351.579	3619.799	119.7	17291.9
EXGRDI	160	2381.264	2770.219	175.2	12136.4
EXGRF	160	4398.583	8476.529	216.3	43993.5

Source: Author.

Separate regressions are also undertaken for industries with extensive GVC participation, namely the electronics, electrical, and machinery industries (EEM). Two distinct periods are also analysed – before and after the global financial crisis (GFC) in 2008–2009. Thus, four separate regressions are undertaken for the following: (i) all industries (ii) EEM industry (iii) 2006–2008 (iv) 2011–2015. The Hausman specification test indicates that a random effects model should be used. The results are summarised in Table 7 below.

Table 7: Drivers of Export Growth in Malaysian Manufacturing

	(1)	(2)	(3)	(4)
	ALL	**EEM**	**< 2009**	**> 2010**
VARIABLES	**EXGR**	**EXGR**	**EXGR**	**EXGR**
EXGRDD	0.260***	0.315***	0.230***	0.325***
	(0.0144)	(0.014)	(0.0174)	(0.018)
EXGRIDI	0.258***	0.167***	0.243***	0.312***
	(0.0157)	(0.0125)	(0.027)	(0.0192)
EXGRF	0.442***	0.535***	0.489***	0.339***
	-0.0146	-0.0145	-0.0299	-0.0177
Constant	0.00187	-0.00157	0.00299	-0.00263
	(0.00147)	(0.00121)	(0.00389)	(0.0017)
Observations	160	30	48	80
Number of industries	16	3	16	16
Standard errors are in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Source: Author.

The results indicate that as much as 44% of the gross exports growth of the manufacturing sector is driven by foreign value-added components. This figure rises to 53% for the electronics, electrical, and machinery industries. Comparing the period before and after the GFC, the contribution of foreign value-added to manufactured exports declined from 49% to 34%.

The above results suggest that whilst GVCs have been an important driver of export growth, their contribution has declined over time. This is consistent with the observation that Malaysia has become less plugged into GVC networks (Taglioni and Winkler 2016, p.97).

5.4. Micro evidence

GVC participation at the firm level in the manufacturing sector can be analysed using probit estimation:

$$Y_i = \boldsymbol{X}_i'\beta_1 + \boldsymbol{D}_i'\beta_2 + \varepsilon_i \qquad (2)$$

where Y is a binary variable indicating GVC participation, $\boldsymbol{X}$ is a vector of firm characteristics (age, ownership, human capital, ICT usage, innovation), and $\boldsymbol{D}$ is a vector of industry dummies.

Table 8 provides a summary of the variables used in the analysis. A firm is defined as a participant in a GVC if it simultaneously exports and imports. Note that this definition of GVC participation (at the micro-level) is different from the earlier industry- and macro-level analyses.

Table 8: Description of Variables

Variable	Description
GVC	The variable takes on the value of 1 if a firm exports and imports simultaneously; it is 0 otherwise
Size	Number of workers
Age	Number of years since establishment
Foreign	Percentage of equity owned by foreigners
Product Innovation	The variable takes on the value of 1 if a firm has product innovation; it is 0 otherwise
SkillPW	Percentage of production workers that are skilled
SkillNPW	Percentage of non-production workers that are skilled
Email	The variable takes on the value of 1 if a firm uses email for business
Website	The variable takes on the value of 1 if a firm uses a website for business

Source: Author.

The data used for this analysis are from the World Bank's enterprise survey for Malaysia covering the year 2015. There is a total of 581 firms from the manufacturing sector in the dataset. Table 9 provides the summary statistics of the data. The average firm size indicates that the sample data are biased towards large firms. This could explain that 32% of firms participated in GVCs.

Table 9: Summary Statistics

Variable	Obs	Yes	%	No	%
GVC	581	189	32	392	68
Product Innovation	581	70	12	511	88
Email	581	440	76	141	24
Website	581	332	57	249	43
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Size (workers)	568	2249	498	2	5160
Age (years)	581	46	203	8	2029
Foreign Ownership (%)	581	9	19	0	100
Skill Prod Workers (%)	572	84	21	0	100
Skill Non-prod Workers (%)	549	78	31	0	100

Source: Author.

The results of the estimates are summarised in Table 10. For all manufacturing firms, the propensity to participate in a GVC is related to a number of factors, such as size (+), foreign ownership (+), product innovation (+), and the proportion of skilled non-production workers (–).

The results are weaker for the sub-sample for electronics, electrical, and machinery (EEM). Only two explanatory variables are statistically significant for two variables: age (+) and the proportion of skilled non-production workers (–). It is plausible that older firms involved in the EEM industries that have participated in GVCs for a long time have continued to do so. The negative coefficient of the skilled non-production workers indicates that a higher proportion of skilled non-production workers is associated with lower GVC participation. This result may indicate that firms in the sector are involved in a relatively lower technology ladder along the upstream-downstream supply chains. This is consistent with evidence on Malaysia's position further upstream in the value chain.

Table 10: Determinants of GVC Participation

Variables	ALL	EEM
Size	0.135***	-0.0226
	(0.0521)	(0.112)
Age	-0.0002	0.0373**
	(0.000382)	(0.0189)
Foreign Ownership	0.0116***	0.0104
	(0.0037)	(0.0063)
Product Innovation	1.032***	0.434
	(0.195)	(0.43)
Skilled Production Workers	9.66E-05	0.00186
	(0.00314)	(0.00694)
Skilled Non-Production Workers	-0.00814***	-0.0126***
	(0.00207)	(0.00422)
Email	-0.0578	0.201
	(0.161)	(0.344)
Website	-0.101	-0.423
	(0.15)	(0.312)
Industry Dummies	Yes	Yes
Constant	-0.407	0.523
	-0.567	-1.039
Observations	536	110
Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1		

Source: Author.

6. Conclusions

The Malaysian economy has been undergoing premature deindustrialisation for the past 2 decades. Given the country's dependence on manufactured exports, deindustrialisation has brought about a decline in the trade share of GDP and the manufactured goods share of exports. A close examination of the electronic, electrical, and machinery (EEM) industries reveals important changes in both relative and absolute terms. The electrical machinery industry has performed well, but two other industries have declined, namely, office machines and automatic data processing equipment as well as telecommunications and sound recording and reproduction apparatus and equipment. Whether these developments are related to changes in the country's participation and position in the global GVC landscape is an important issue. The shares of foreign manufacturing and services in the country's manufactured exports have both declined.

There is evidence of a decline in backward GVC participation in the Malaysian manufacturing sector. The computer, electronic, and optical products industry experienced a 12% decline in backward GVC participation during the 2005–2016 period. The source of this decline needs to be further investigated in the context of deindustrialisation. A decline in backward GVC participation implies a greater share of inputs being sourced domestically (which suggests stronger domestic manufacturing capability), but this has taken place amidst a decline in exports' share of GDP. The decline in the volume of exports may have been a driver of this. It could also imply greater non-manufacturing domestic inputs being used in manufacturing.

There is also some evidence of upgrading in the country's GVC position, but its attractiveness as a base for outsourcing has declined. Although GVCs have been important drivers of export growth, their contribution has declined over time. Micro-level evidence shows that higher levels of skilled non-production workers are associated with a lower probability of GVC participation. This may reflect manufacturing firms being involved in lower parts of the technology ladder.

The evidence reviewed in this study clearly suggests that research on GVCs and deindustrialisation is still at a nascent stage. More research on firm-level performance and labour markets is needed to examine these aspects of GVCs and

deindustrialisation. It would also be useful to undertake further research on the extent to which domestic firms have fared in terms of upgrading manufacturing capability, innovating, and participating in GVCs.

Given the importance of manufacturing as a driver of the country's future growth, there are a number of key policy implications from the empirical findings of this study. The competitiveness of Malaysia's export-oriented manufacturing sector will depend on its ability to upgrade its participation and position in GVCs. The required policies can be both nuanced and complex (Gereffi, 2019). In relation to this, recent economic plans, such as the 12th Malaysia Plan and the National Trade Blueprint, have emphasised a greater focus on human capital development and technological innovation. With regards to human capital, the areas that require further policy attention include secondary school enrolment, learning outcomes, childhood stunting, and social protection (World Bank, 2018).

Other studies, such as Kimura (2013), have suggested that agglomeration economies can slow down deindustrialisation. There is evidence that the country's dependence on low-skilled foreign labour has adversely impacted agglomeration economies (Lee, 2019). This problem has been highlighted in recent policy plans, but it has been challenging to reduce the dependence on foreign workers.

Although this study did not include institutional factors in the empirical analysis, the research literature on GVCs does point to the importance of institutions. Hence, institutional reforms – focusing on the regulatory and legal environment – should be another area of focus. The political instability in Malaysia in recent years, as well as the impact of the COVID-19 pandemic, has made such reforms difficult. However, the country's participation in regional trade agreements (such as the Regional Comprehensive Economic Partnership) is likely to bring about some of the required reforms.

References

Antràs, P. (2020), 'Conceptual Aspects of Global Value Chains', *World Bank Economic Review*, 34(3), pp.551–74.

Antràs, P. and A. de Gortari (2017), 'On the Geography of Global Value Chains', *NBER Working Paper* No. 23456. Cambridge, MA: National Bureau of Economic Research.

Baldwin, R. and A.J. Venables (2013), 'Spiders and Snakes: Offshoring and Agglomeration in the Global Economy', *Journal of International Economics*, 90, pp.245–54.

Bernard, A.B., V. Smeets, and F. Warzynski (2017), 'Rethinking Deindustrialization', *Economic Policy*, 32(89), pp.5–38.

Borin, A. and M. Mancini (2019), 'Measuring What Matters in Global Value Chains and Value-Added Trade', *Policy Research Working Paper* No. 8804. Washington, DC: World Bank.

Chenery, H.B. and M. Syrquin (1975), *Patterns of Development, 1950-1970*. New York, NY: Oxford University Press.

Chenery, H.B., and M. Syrquin (1986), 'Typical Patterns of Transformation', in H.B. Chenery, S. Robinson, and M. Syrquin (eds.), *Industrialization and Growth: A Comparative Study*. New York, NY: Oxford University Press.

Criscuolo, C. and J. Timmis (2018), 'GVCs and Centrality: Mapping Key Hubs, Spokes and the Periphery', *OECD Productivity Working Papers*, 2018-12. Paris: OECD Publishing.

Dasgupta, S. and A. Singh (2006), 'Manufacturing, Services and Premature Deindustrialization in Developing Countries: A Kaldorian Analysis', *UNU-WIDER Research Paper* No. 2006/49. UNU-Wider.

De Backer, K. and S. Miroudot (2013), 'Mapping Global Value Chains', *OECD Trade Policy Papers*, No. 159. Paris: OECD Publishing.

Eberhardt, M. and F. Teal (2012), 'Structural Change and Cross-Country Growth Empirics', *World Bank Economic Review*, 27(2), pp.229–71.

Gereffi, G. (2019), 'Economic Upgrading in Global Value Chains', in S. Ponte, G. Gereffi, and G. Raj-Reichert (eds.), *Handbook of Global Value Chains*. Cheltenham, United Kingdom: Edward Elgar.

Herrendorf, B., R. Rogerson, and A. Valentinyi (2014), 'Growth and Structural Transformation', in *Handbook of Economic Growth, Volume 2B*. Amsterdam: Elsevier.

Johnson, R.C. and G. Noguera (2017), 'A Portrait of Trade in Value-Added over Four Decades', *Review of Economics and Statistics*, 99(5), pp.896–911.

Jomo, K.S. (ed.) (2007), *Malaysian Industrial Policy*. Singapore: NUS Press.

Kaldor, N. (1966), *Causes of the Slow Rate of Economic Growth of the United Kingdom*. Cambridge, United Kingdom: Cambridge University Press.

Kimura, F. (2013), 'How Have Production Networks Changed Development Strategies in East Asia', in D.K. Elms and P. Low (eds.), *Global Value Chains in a Changing World*. Geneva, Switzerland: World Trade Organization.

Kimura, F. and A. Obashi (2010), 'International Production Networks in Machinery Industries: Structure and its Evolution', *ERIA Discussion Paper Series* 2010-09. Jakarta: ERIA.

Koopman, R., W. Powers, Z. Wang, and S.-J. Wei (2010), 'Give Credit Where Credit is Due: Tracing Value Added in Global Production Chains', *NBER Working Paper* No. 16426. Cambridge, MA: NBER.

Kuznets, S. (1966), *Modern Economic Growth*. New Haven, CT: Yale University Press.

Lee, C. (2019), 'Agglomeration, Human Capital and Foreign Labour: The Case of Malaysia', *ISEAS Economics Working Paper*, 2019-8. Singapore: ISEAS.

Obashi, A. (2021), 'Overview of FDI, trade, and GVCs in East Asia', mimeo.

Okan, E. (2017), 'How Did It All Begin? Adam Smith on the Early and Rude State of Society and the Age of Hunters', *European Journal of the History of Economic Thought*, 24(6), pp.1247–76.

Rasiah, R. (2011a), 'Is Malaysia Facing Negative Deindustrialization?', *Pacific Affairs*, 84(4), pp.715–36.

Rasiah, R. (2011b), 'Industrial Policy and Industrialization', in R. Rasiah (ed.), *Malaysian Economy: Unfolding Growth and Social Change*. Kuala Lumpur: Oxford University Press.

Robert-Nicoud, F. (2008), 'Offshoring of Routine Tasks and (De)industrialisation: Threat or Opportunity—And for Whom?', *Journal of Urban Economics*, 63, pp.517–35.

Rodrik, D. (2016), 'Premature Deindustrialization', *Journal of Economic Growth*, 21, pp.1–33.

Rowthorn, R. and R. Ramaswamy (1997), 'Deindustrialization: Causes and Implications', *IMF Working Paper* No. WP/97/42. Washington, DC: International Monetary Fund.

Rowthorn, R. and R. Ramaswamy (1998), 'Growth, Trade and Deindustrialization', *IMF Working Paper* No. WP/98/60. Washington, DC: International Monetary Fund.

Rowthorn, R. and J. Wells (1987), *De-Industrialization and Foreign Trade*. Cambridge, United Kingdom: Cambridge University Press.

Singh, A. (1977), 'UK Industry and the World Economy: A Case of De-industrialisation', *Cambridge Journal of Economics*, 1(2), pp.113–36.

Stijepic, D. (2011), 'Structural Change and Economic Growth: Analysis within the Partially Balanced Growth Framework', PhD dissertation, Fern Universit¨at in Hagen.

Sumner, A. (2019), 'Deindustrialization, Tertiarization and Development in a 'GVC-World': What Do New Trajectories of Structural Transformation Mean for Developing Countries?', *ESRC GPID Research Network Working Paper* No. 16.

Syrquin, M. (1988), 'Patterns of Structural Change', in H. Chenery and T.N. Srinivasan (eds.), *Handbook of Development Economics, Volume I*. Amsterdam: Elsevier.

Syrquin, M. and H. Chenery (1989), 'Three Decades of Industrialization', *World Bank Economic Review*, 3(2), pp.145–81.

Taglioni, D. and D. Winkler (2016), *Making Global Value Chains Work for Development*. Washington, DC: World Bank.

Tan, J. (2014), 'Running Out of Steam? Manufacturing in Malaysia', *Cambridge Journal of Economics*, 38, pp.153–80.

Van Neuss, L. (2019), 'The Drivers of Structural Change', *Journal of Economic Surveys*, 33(1), pp.309–49.

World Bank (2018), 'Realizing Human Potential', *Malaysia Economic Monitor*, December. Kuala Lumpur: World Bank.

World Bank (2020), *World Development Report 2020: Trading for Development in the Age of Global Value Chains*. Washington, DC: World Bank.

World Trade Organization (2014), *World Trade Report 2014*. Geneva, Switzerland: World Trade Organization.