

GVCs and Premature Deindustrialization in Malaysia Cassey Lee



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Introduction

- Malaysia economy shrank by 5.6% in 2020 due to the implementation of control measures to contain Covid-19 & adverse external environment
- Even though the economy is expected to recover eventually, its long-term growth prospects is uncertain due to structural changes in the Malaysian economy
- Malaysian economy has been deindustrializing for the past twenty years
- Manufacturing sector's share of GDP declined from a peak of 30.9% in 1999 to 21.4% in 2019
- Malaysian economy undergoing "premature deindustrialization"



Motivation

- Is Malaysia's premature deindustrialization due to changes in the country's participation in global value chain (GVC)?
- The goal of this study is to examine the role of GVC participation in Malaysia's premature deindustrialization experience



Structure of Paper

- 1. Introduction
- 2. Literature Review
- 3. Structural Change in the Malaysian Economy
- 4. Malaysia's Participation in Global Value Chain
 - General trends in GVC Participation
 - Industry-level Analysis: Manufacturing Exports Growth and GVCs
 - Micro-Level Analysis: Determinants of GVC Participation
- 5. Conclusions & Policy Implications



Concepts & Definitions

- **Structural Change**: Reallocation of economic activity across the three broad sectors of the economy, namely, agriculture, industry and services (Herrendorf et al, 2014)
- Industrialization: Shift in the relative importance of economic activities from agriculture to manufacturing (Syrquin, 1988)
- **Deindustrialization**: Decline in the relative contribution of manufacturing
- Premature Deindustrialization: Deindustrialization at levels of income that are a fraction of those at which the advanced economies started to deindustrialize (Rodrik, 2016)





Literature Review 1: Deindustrialization

- Industrialization (Kuznets, 1966) & Deindustrialization (Kaldor, 1966)
- Singh (1977) deindustrialization due to weaknesses in competitiveness of manufactured exports
- Rowthorn and Wells (1987) positive & negative deindustrialization, export competitiveness
- Rowthorn and Ramaswamy (1997, 1998) → trade not an important driver of deindustrialization in the advanced economies
- Rodrik (2016) → premature deindustrialization in developing countries - driven by globalization and labour-saving technological progress in manufacturing



Literature Review 2: Deindustrialization and GVCs

- Nicoud-Robert (2008) → premature deindustrialization due to countries unable to maintain complex or strategic functions in offshoring process
- Stijepic (2011) → offshoring can slowdown the process of deindustrialization by enhancing the productivity of the manufacturing sector
- Baldwin & Okubo (2019) deindustrialization driven by off-shoring and changes in comparative advantage
- Sumner (2019) → premature deindustrialization is related to GVCs through three channels, namely:
 - Trade liberalization and the decline in relative prices of manufactured goods
 - Stuck in low-value added sections of GVCs
 - Spreading and thinning out of manufacturing activities across increasingly large numbers of developing countries
- Sumner (2019) \rightarrow Premature deindustrialization driven by poor institutions resulting in failure to upgrade GVC participation
- World Bank (2020) → list of institutions important for upgrading GVC participation: governance, standards certification, contracts and intellectual property rights

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Drivers of Premature Deindustrialization

- Decline in export competitiveness (Rawthorn & Wells, 1987)
- Inability to maintain complex or strategic functions in offshoring process (Nicoud-Robert, 2008)
- Globalization and labour-saving technology (Rodrik, 2016)
- Off-shoring and changes in comparative advantage (Baldwin & Okubo, 2019)
- Stuck in low-value added sections of GVCs (Sumner, 2019)
- Spreading and thinning out of manufacturing activities across increasingly large numbers of developing countries (Sumner, 2019)
- Poor institutions & failure to upgrade GVC participation (Sumner, 2019)



Structural Change – Macro-Level

- Three Phases:
 - Phase I: Primary Commodities (late 19th century until 1960s)

 \rightarrow Primary sector (agriculture – rubber and mining - tin) predominated the economy

- Phase II: Industrialization (1960s 1999)
 - → Manufacturing sector's share of GDP increased [Agriculture's share of GDP declined continuously from 45% in 1961 to 7% in 2019]
- Phase III: Premature Deindustrialization (1999 today)
 - → relative contribution of the manufacturing sector began to decline [deindustrialization phase]





Sectoral Composition of GDP (%)





Sectoral Composition of Employment (%)



Structural Change in Manufactured Exports

- Deindustrialization \rightarrow decline in trade ratio
- Decline in manufacturing share of exports
- Relative decline in the exports of machinery and transport equipment: 63% in 1988 [Peak] \rightarrow 38% in 2012
- Three sub-industries account for between 86%-94% of exports from the machinery and equipment industry:
 - 1. Office machines and automatic data processing equipment [SITC-2 code 75] [Decline]
 - 2. Telecommunications and sound recording and reproducing apparatus and equipment [76] [Decline]
 - 3. Electrical machinery, apparatus and appliances, n.e.c. and electrical parts thereof [77] [Increase]





Trade's Share of GDP and Manufactures' Share of Exports





Share of Machinery and Transport Equipment in Total Exports and Total Imports





Exports and Imports of Machinery and Transport Equipment



Share of Key Industries in Machinery and Transport Equipment Exports





Total Exports of Key Machinery and Transport Equipment Industry

Export-Import Trends in Machinery and Transport Equipment

- Office machines and automatic data processing equipment industry [SITC 75]:
 - After 2006, decline in both exports and imports
 - Export-Import gap narrowing
- Telecommunications and sound recording and reproducing apparatus and equipment industry [SITC 76]
 - Exports declined during 2006-2012 period & stabilized thereafter (2007-2019)
 - Imports continue to increase over time resulting in a higher import/export ratio
- Electrical machinery, apparatus and appliances industry (SITC 77) is quite different
 - Imports exceed exports during 1990 to 2010
 - Reverse after 2010 with the gap widened
- GVCs important in the machinery and transport equipment industry
- Are these developments reflective of changes in the country's participation in GVCs?



Office Machines and Automatic Data Processing Equipment (SITC 75) - Exports and Imports





Electrical Machinery, Apparatus and Appliances (SITC 77) - Exports and Imports



Trade Patterns and GVCs

- For industries SITC 75 and SITC 76 \rightarrow decline in exports indicate that production fragmentation could have shifted away (from Malaysia)?
- Industry SITC 77 → more electronic components are now produced and exported than incorporated into final good exports?
- 10 countries account for 87% and 80% of Malaysia's imports and exports of machinery and equipment
- Largest source of imports in 2019 is China [substantial trade deficit]
- Malaysia has substantial surplus in machinery and equipment trade with United States, Singapore and Hong Kong
- To get a clearer picture \rightarrow Need to examine sources value-added creation



FDI Trends

- Structural change is reflected in FDI inflows aggregate & sectoral trends
- Decline in FDI inflows (% of GDP) over time
- Upward trend in FDI inflows into the services sector
- Relative decline in manufacturing FDI inflows, especially in recent times



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Malaysia: Foreign Direct Investment - Equity and Investment Fund Shares (RM Million)





Malaysia: Foreign Direct Investment in Manufacturing Sector - Equity and Investment Fund Shares (RM Million)

- ----Petroleum, chemical, rubber and plastic products
- ----Non-metallic mineral products, basic metal and fabricated metal products
- ----Electrical, transport equipment and other manufacturing

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Malaysia's Participation in Global Value Chain

- Overall backward GVC participation declined: 45% in 2005 → 37% in 2015
- Overall forward GVC participation remained more or less stable:

16-19% during the period 2005-2015

- Manufacturing Sector: Decline in backward GVC participation across almost all the manufacturing industries
- Machinery and equipment industry had, on average, the highest degree of backward GVC participation across all industries
- Computer, electronic and optical products industry experienced a 12 percent decline in backward GVC
 Enticipation during the 2005-2016 period

Overall Backward and Forward GVC Participation



Backward GVC Participation in Selected Countries



Industry-Level Analysis: Manufacturing Exports Growth and GVCs

- GVC participation as a driver of export growth
- Decompose gross export growth (EXGR) into:
 - domestic direct value-added component (EXGRDD)
 - domestic indirect value-added component (EXGRDI)
 - foreign value-added component (EXGRF) [GVC Participation]
- Panel-data analysis for industry i at time t is modelled as follows:

 $D.InEXGR_{it} = \alpha_0 + \alpha_{1t}D.InEXGRDD_{it} + \alpha_2D.InEXGRDI_{it} + \alpha_3D.InEXGRF_{it} + \epsilon_{it}$

• Data: TiVA (OECD), 2006-2015

Results

- About 44% of gross exports growth of the manufacturing sector 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%
- GVCs are important drivers of export growth but their contributions have declined over time
- Consistent with the observation that Malaysia has become less plugged into GVC networks (World Bank, 2016, p.97).



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 ind	16	3	16	16
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				



Micro-Data Analysis:

- What determines GVC participation at the firm-level?
- Probit estimation:

 $Y_i = X_i'\beta_1 + D_i'\beta_2 + \epsilon_i$

where Y is binary variable indicating GVC participation, X the vector of firm characteristics (age, ownership, human capital, ICT usage, innovation) and D the vector of industry dummies

- A firm is defined as a participant in GVC if it simultaneously exports and imports
- Data: World Bank's Enterprise Survey (2015)



Description of Variables

Variable	Description
GVC	The variable takes on the value of 1 if a firm exports and imports simultaneous, 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 website for business



Results

- Propensity to participate in GVC \rightarrow size (+), foreign ownership (+), product innovation (+) and percentage of skilled non-production workers (-)
- Results weaker for the sub-sample for electronics electrical and machinery (EEM) → only variables significant – age (+) and proportion of skilled nonproduction workers (-)
 - Older firms involved in the EEM industries that has participate in GVC for a long time has continued to do so
 - Negative coefficient of the skilled non-production workers → firms involved relatively lower technology ladder along the upstream-downstream supply chains
 - Consistent with evidence on Malaysia's position in further upstream in the value chain (World Bank, 2016)



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 in parentheses				
*** p<0.01. ** p<0.05. * p<0.1				



Conclusions and Policy Implications

- Malaysian economy has been undergoing premature deindustrialization for the past two decades
- Key components of the electronic, electrical and machinery (EEM) industries have declined relative to others → Likely to be due to a decline in the country's GVC participation in these industries
- Industry evidence → contribution of foreign value-added to manufactured exports has declined
- Microdata evidence \rightarrow EEM firms being possibly stuck at lower-level technologies
- Policy implications → Greater focus on human capital development and technological innovation
- Institutional reforms focusing on regulatory and legal environment
- Servicification of manufacturing important implications for service sector development



THANK YOU

