

WORK IN AN EVOLVING MALAYSIA

THE STATE OF HOUSEHOLDS 2020 PART II



WORK IN AN EVOLVING MALAYSIA

THE STATE OF HOUSEHOLDS 2020 PART II

KHAZANAH
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ABBREVIATIONS

AFC	:	Asian Financial Crisis
AI	:	Artificial Intelligence
b	:	Billion
B40	:	Bottom 40% (of the population)
BNM	:	Bank Negara Malaysia
CAGR	:	Compound annual growth rate
CEO	:	Chief Executive Officer
COE	:	Compensation of employees
COVID-19	:	Coronavirus Disease 2019
DOS	:	Department of Statistics
E&E	:	Electrical and Electronics Industry
ECER	:	East Coast Economic Region
EPF	:	Employees' Provident Fund
GDP	:	Gross Domestic Product
GFC	:	Global Financial Crisis
GOS	:	Gross operating surplus
ICOR	:	Incremental Capital to Output Ratio
ICT	:	Information and Communication Technology
ILMIA	:	Institute of Labour Market Information and Analysis
ILO	:	International Labour Organization
INT\$	:	International Dollar
IOT	:	Internet of Things
IR4	:	Fourth Industrial Revolution
k	:	Thousand
KL	:	W.P. Kuala Lumpur
LFPR	:	Labour force participation rate
LIS	:	Labour income share
m	:	Million
M40	:	Middle 40% (of the population)
MASCO	:	Malaysia Standard Classification of Occupations
MCO	:	Movement Control Order
MDEC	:	Malaysia Digital Economy Corporation
MEF	:	Malaysian Employers Federation
NCER	:	Northern Corridor Economic Region
OECD	:	Organisation for Economic Co-Operation and Development
OLS	:	Ordinary Least Squares

ABBREVIATIONS

PPT	:	Percentage points
PST	:	Professional, Scientific and Technical Services
R&D	:	Research and development
RM	:	Malaysian Ringgit
SMEs	:	Small and medium enterprises
SOCSSO	:	Social Security Organisation
SOH2020	:	The State of Households 2020
SPM	:	<i>Sijil Pelajaran Malaysia</i>
STPM	:	<i>Sijil Tinggi Persekolahan Malaysia</i>
SWTS	:	School-To-Work Transition Survey
T20	:	Top 20% (of the population)
TFP	:	Total factor productivity
TLS	:	Taxes less subsidies
UR	:	Unemployment rate
WP	:	Wilayah Persekutuan

GLOSSARY

- Compensation of employees** : Compensation of employees includes remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done during the accounting period.
Source: DOS (2020g)
- Decent work** : Involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organise and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men.
Source: ILO (n.d.a)
- Digital economy** : A wide range of economic activities that use digitised information and knowledge to deliver the production.
Source: DOS (2019e)
- Gross operating surplus** : The operating surplus before deducting the consumption of fixed capital and mixed income.
- Operating surplus measures the surplus or deficit accruing from processes of production before deducting any explicit or implicit interest charges, rent or other property income payable on the financial assets, land or other natural resource required to carry on the production. By definition, operating surplus can only be earned by industries.
- Consumption of fixed capital is defined as the decline in the current value of the stock of fixed assets owned and used by a producer during the course of the accounting period as a result of physical deterioration, normal obsolescence or nominal accidental damage.
- Mixed income includes an unknown element of remuneration for work done by the owner of the enterprise, or other members of the household, as well as operating surplus accruing from the production.
Source: DOS (2020g)
- Labour force participation rate** : A proportion of working age population (15 to 64 in Malaysia) who are either working or looking for work.
Source: ILO (n.d.b)
- Malaysia Standard Classification of Occupations** : A national benchmark for the classification of occupations in Malaysia. It is developed based on the International Standard Classification of Occupations (ISCO) that is maintained by the ILO.
Source: MOHR (n.d.)

GLOSSARY

- Manufacturing** : High-technology manufacturing refers to manufacturing of electrical and electronics (E&E) products and transport equipment.
- Mid-technology manufacturing refers to manufacturing of petroleum, chemical, rubber, plastic, non-metallic mineral, basic metal and fabricated metal products.
- Low-technology manufacturing refers to manufacturing of food, beverages, tobacco, textiles, wearing apparel, leather, wood, furniture, paper and printing products.
Source: Ng, Tan, and Tan (2018)
- Modern services** : Modern services include information and communication; financial and insurance/takaful activities; real estate activities; and professional, scientific and technical activities.
Source: Ng, Tan, and Tan (2018)
- Net capital stock** : The sum of the written-down values of all the fixed assets still in use is described as the net capital stock; it can also be described as the difference between gross capital stock and consumption of fixed capital.
Source: UN (n.d.)
- Non-standard employment** : There is no official definition, but it typically refers to employment arrangements that deviate from those of standard employment. Standard employment is typically a full-time job with a clear employer-employee relationship.
Source: ILO (n.d.b)
- Other services** : Other industries under the services sector excluding modern services. These include services for utilities, wholesale and retail, transportation and storage; food and accommodation; administrative and support services; public administration and defence; education; health and social work; arts, entertainment and recreation; and other services.
- Self-employed workers** : Individuals whose remuneration depends directly on the profits derived from the goods and services they produce, with or without other employees, and include employers, own account workers, and members of producers cooperatives.
Source: World Bank (n.d.b)

GLOSSARY

Small- and medium-sized enterprises (SMEs)	:	Micro firms employ fewer than five full-time employees and have annual sale turnover less than RM300,000. Small firms in manufacturing employ between five and 75 workers and have annual sale turnover between RM300,000 and less than RM15 million; firms in other sectors employ between five and 30 workers and have annual sale turnover between RM300,000 and less than RM3 million. Medium firms in manufacturing employ between 75 and 200 workers and have annual sale turnover between RM15 million and less than RM50 million; firms in other sectors employ between 30 and 75 workers and have annual sale turnover between RM3 million and less than RM20 million. <i>Source: SME Corp. (2013) cited in DOS (2017a)</i>
Taxes less subsidies	:	Taxes on products and production, minus subsidies on products and production.
Time-related underemployment	:	All employed individuals who worked less than a threshold (in Malaysia 30-hour work week), are willing and available to work additional hours. <i>Source: ILO (n.d.b)</i>
Unemployment rate	:	A proportion of unemployed individuals out of the total individuals in the labour force (either working or looking for work). Unemployed individuals comprise all individuals of working age: (1) who were available and actively looking for work during the reference week, also known as the actively unemployed; and (2) who were available but not actively looking for work, also known as the inactively unemployed. Inactive unemployed include those who were not actively looking for work because (i) of the perception of no job available or not qualified; (ii) their health condition (temporarily ill) or weather condition; and (iii) were waiting for result of job applications made prior to the reference week. <i>Source: DOS (various years.b)</i>
Vulnerable employment	:	A proportion of employed individuals who are working as own account workers and unpaid family workers. These two groups of workers typically do not have formal working arrangements and are therefore more likely to suffer from decent work deficits. <i>Source: ILO (2018b)</i>

GLOSSARY

Wage and salaried workers : Individuals who hold the type of jobs defined as paid employment jobs, where the incumbents hold explicit (written or oral) or implicit employment contracts that give them a basic remuneration that is not directly dependent upon the revenue of the unit for which they work.

Source: World Bank (n.d.b)

EXECUTIVE SUMMARY

In 2019, employment-related incomes made up more than 80% of household income. Household income is closely linked to labour market conditions and the realities of work differ between employed persons in different parts of the country. This report looks at Malaysia's labour market development in the past three decades (1989 to 2019). Taking a regional perspective, it discusses present conditions of work and workforce in different states, as well as opportunities and challenges faced as we move into the future. States are grouped as follows:

- (i) **Group A:** Kuala Lumpur, Putrajaya and Selangor
- (ii) **Group B:** Johor, Melaka, Negeri Sembilan, Pulau Pinang and Terengganu
- (iii) **Group C:** Labuan, Sabah and Sarawak
- (iv) **Group D:** Kedah, Kelantan, Pahang, Perak and Perlis

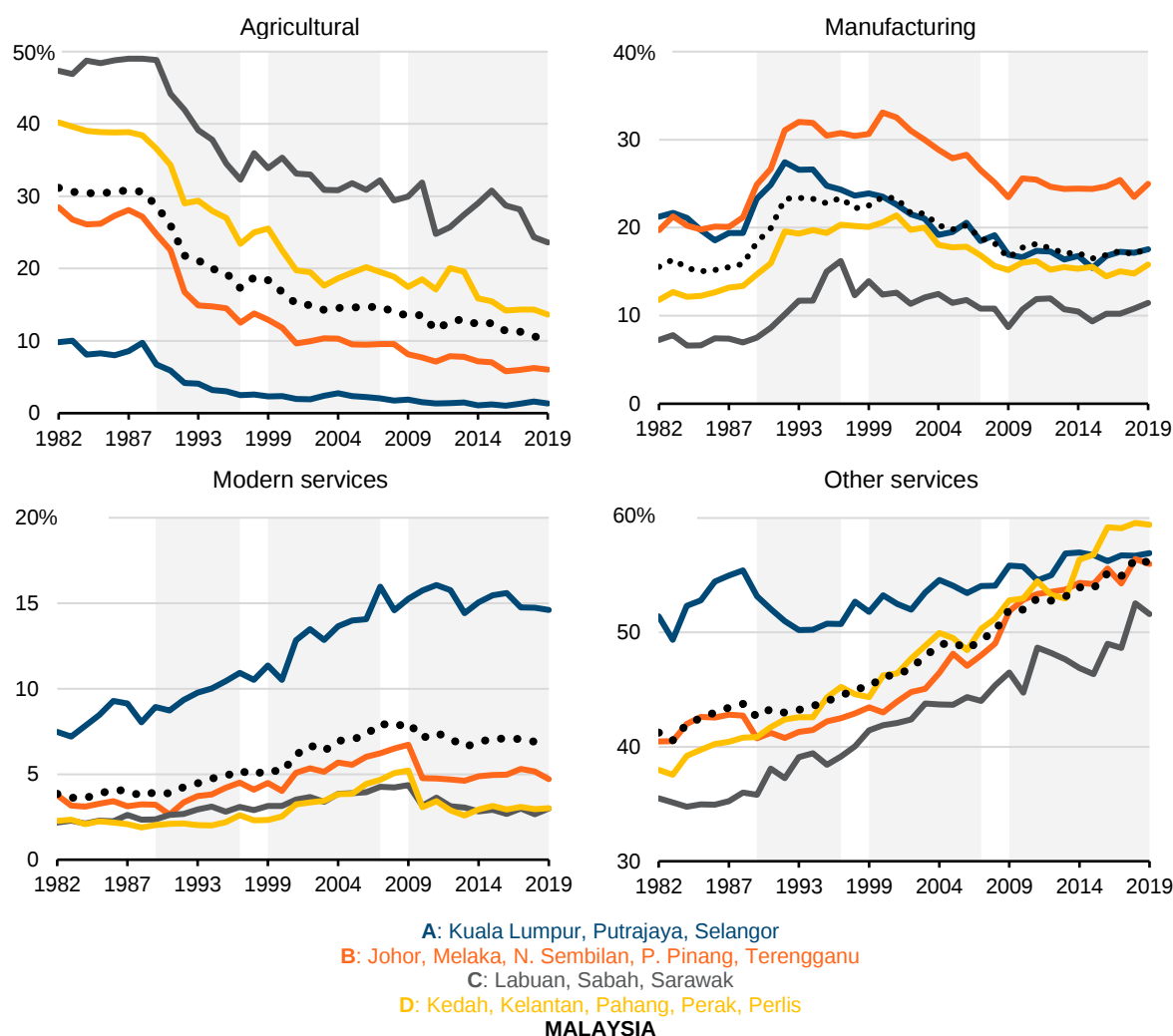
Structural change of the economy underpins development, employment landscape varies between states

Agriculture activities concentrated in the north and east coast states of the peninsular as well as Sabah and Sarawak. Although agricultural employment has declined over time, it accounted for 23.6% of total employment in Group C states, and 13.6% in Group D states in 2019. As the agriculture sector consistently reported a higher incidence of fatal injuries and have more non-standard workers typically unprotected by formal social protection schemes, *decent work deficit* could be more prevalent in states with high agricultural employment.

States on the west coast of the peninsular have industrialised more and retain high manufacturing employment shares. In 1982, manufacturing employment accounted for 21.3% and 19.7% of total employment in Groups A and B states respectively, while the shares were just 7.3% and 11.8% in Groups C and D states. By 2019, advanced states in Groups A and B still have higher manufacturing employment shares such as 20.0% in Selangor and 37.1% in Pulau Pinang, compared to less advanced states in Groups C and D, with shares as low as 7.7% in Labuan and 10.2% in Perlis. High-technology manufacturing, which is an export-oriented manufacturing subsector that hires a higher proportion of skilled employed persons, is concentrated in advanced states too.

Since the 2000s, the economy of all states shifted to be services-based. Between 1999 and 2019, employment in services expanded in all states, amid lacklustre employment growth on other economic activities. However, “modern services”—services subsectors which are urban-based, skilled, better compensated and less likely to face *decent work* deficits—are concentrated in Group A states. In 2019, 14.6% of employed persons in Kuala Lumpur, Putrajaya and Selangor were employed in “modern services”, while the share was less than 10.0% for other states.

Employment share, by economic activity and state group, 1982 – 2019



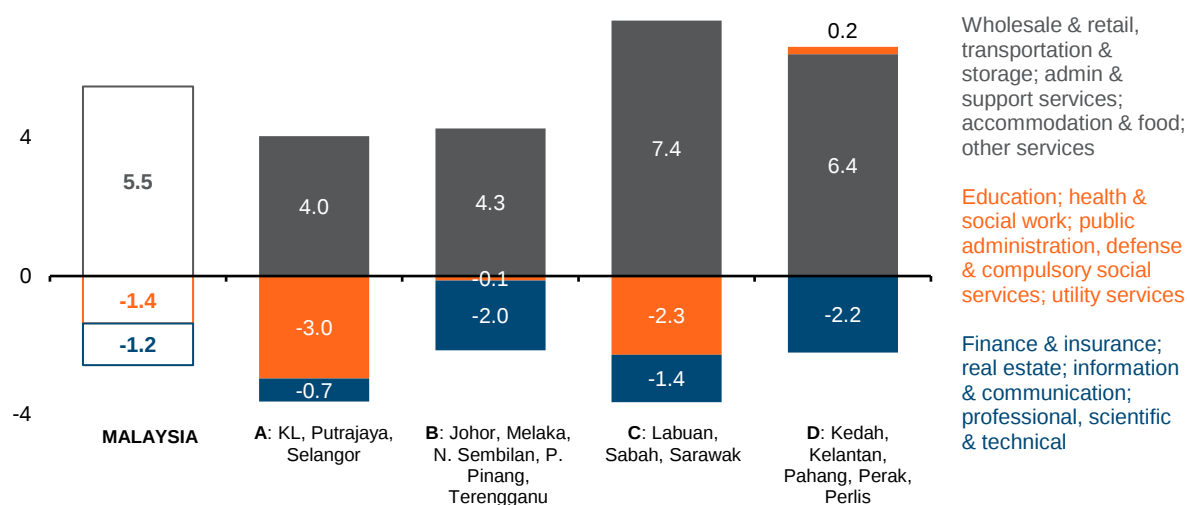
Note: Data unavailable for 1991 and 1994. Shaded regions cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively. Classification for modern services adapted from Ng, Tan, and Tan (2018). Modern services refer to *finance & insurance, real estate, information & communication, and professional, scientific & technical*.

Source: DOS (2020b), KRI calculations

“Traditional services” employment expanded significantly in the economy compared to other services subsectors. Between 2009 and 2019, employment share of “traditional services” such as *wholesale & retail, food & beverages* and *accommodation* expanded by 5.5 percentage points nationally from 34.8% of total employment to 40.3%, while employment share in *modern services* contracted by 1.2 percentage points from 8.0% of total employment to 6.8%. The share of “social services” (e.g. *education* and *public administration*, among others) also contracted by 1.4 percentage points from 17.2% of total employment to 15.8% during the same period. The decline is a concern as the subsectors provide essential services for social wellbeing of the population, in addition to valuable employment opportunities for an increasingly skilled workforce.

Change in services employment share, by subsector and state group, 2009 – 2019

8 ppt

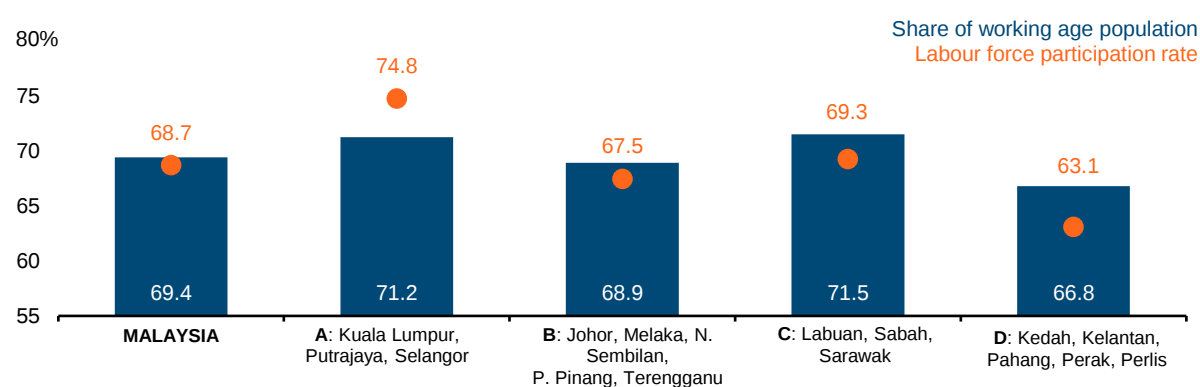


Source: DOS (2020b), KRI calculations

In tandem with evolution of economic structures, labour market outcomes also vary between states in Malaysia

Economically advanced states have seen a rise in labour force participation rates (LFPR) compared to others. In Group A states, close to three in four (~75%) of the working age population (15 to 64 years old) participate in the labour market, while other states have LFPR less than 70%. Increasing job opportunities and gearing active labour market policies to unlock barriers faced by working age population to take part in the workforce could raise LFPR further.

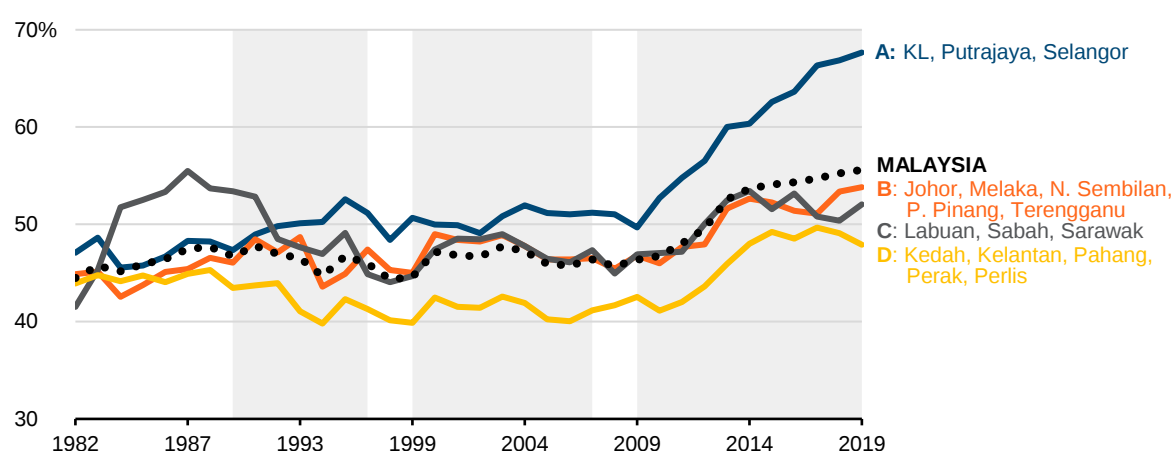
Working age population share and LFPR, by state group, 2019



Source: DOS (2017b), DOS (2020b), KRI calculations

Women's participation in the labour market drives LFPR growth, particularly in Group A states. Between 1982 and 2019, women's LFPR jumped by 11.1 percentage points from 44.5% to 55.6%, amid modest rise of 3.9 percentage points of overall LFPR. In Group A states, the expansion of women's LFPR in the last decade was highest at 18.0 percentage points from 49.7% to 67.7%, while other states expanded by less than 10.0 percentage points from about 45.4% to 51.3%. Flexible work arrangement, providing care work support, fostering paternal involvement in childbearing and removing policies that could damage women's ability to participate in the labour force could push women's LFPR further, especially for less advanced states, where participation of prime age women remains lacklustre.

Women's LFPR, by state group, 1982 – 2019

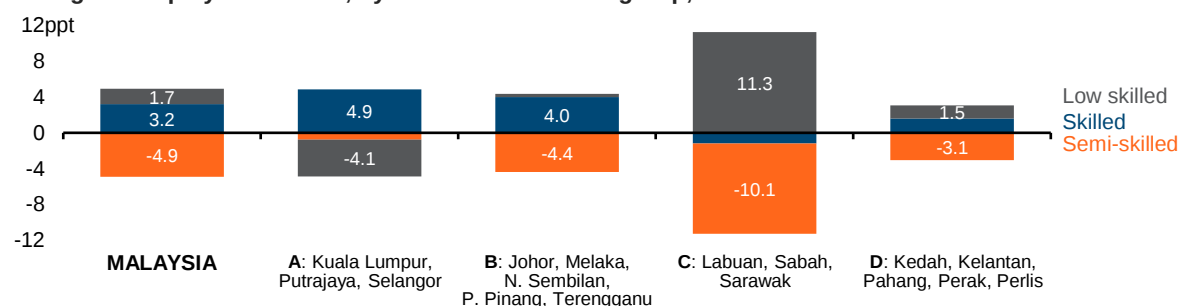


Note: Data unavailable for 1991 and 1994. Shaded regions cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively.

Source: DOS (2020b), KRI calculations

As a result of structural changes in the economy, skilled jobs have become more concentrated in the economically advanced states. In the past two decades, skilled employed persons have expanded in Groups A and B states (by 4.9 and 4.0 percentage points respectively), while low skilled employed persons expanded in Groups C and D states (by 11.3 and 1.5 percentage points respectively)—amid the general contraction of semi-skilled jobs. Educated employed persons also tended to concentrate in Groups A and B states given the geographic concentration of skilled jobs.

Change in employment share, by skill level and state group, 2001 – 2019



Note: Skill classification follows DOS (Various years.c).

Source: DOS (2020b), KRI calculations

Within semi-skilled jobs, services & sales workers grew the most in recent years but with low wage growth. Between 2011 and 2019, the expansion of semi-skilled *services & sales workers* (by 2.4 percentage points from 20.3% of total employment to 22.6%) did not offset the overall contraction of semi-skilled employed persons. This expansion is worrying considering its sluggish wage growth (3.4% annually), relatively lower wage level (RM 2,060) and its high risk of job displacement due to automation.

Job and wage polarisation, by skill level and occupation, 2011 – 2019

	Change in employment share (ppt, 2011 – 2019)	Mean monthly salary (RM, 2019)	Annual wage growth (%, 2011 – 2019)
Overall			
Skilled	1.5	5,073	3.9
Semi-skilled	-1.5	2,205	3.6
Low skilled	0.0	1,751	5.2
Skilled			
Managers	-1.0	8,855	5.6
Professionals	2.6	5,589	4.1
Asc. professionals	-0.1	3,651	3.1
Semi-skilled			
Clerical workers	-1.1	2,482	2.9
Service & sales workers	2.4	2,060	3.4
Skilled agricultural workers	-2.0	2,247	5.9
Craft workers	-0.4	2,197	3.9
Production operators	-0.3	2,144	4.3
Low skilled			
Elementary occupations	0.0	1,751	5.2

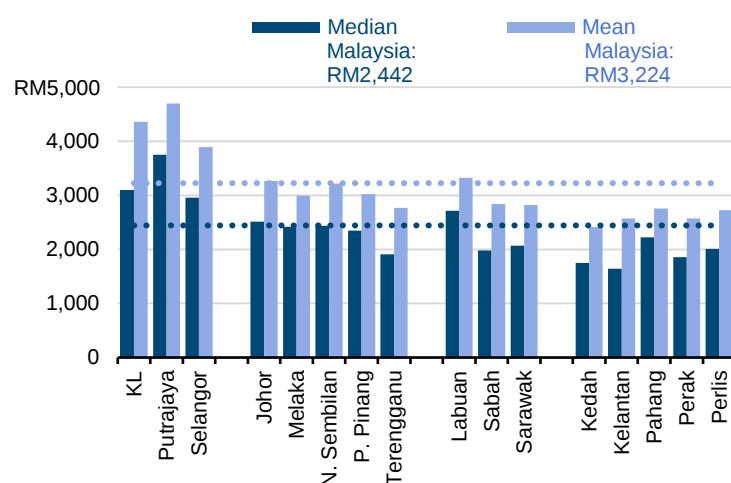
Note: Skill classification follows ILO (n.d.c) and DOS (various years.b).

Source: DOS (2020i), DOS (2020b), KRI calculations

Salaried employees in Group A states are remunerated better than others. The combination of higher skilled and educated employed persons, as well as the concentration of “modern services” employment in Group A states have unsurprisingly raised wage levels and household incomes further above other states in the country. The nature of firms also matters, with less advanced states having higher shares of employment in small and medium enterprises (SMEs), which typically pay lower salaries than large firms.

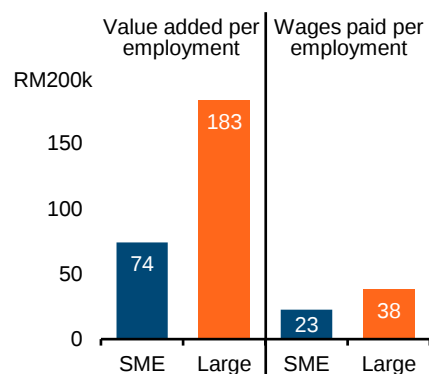
Economically advanced states have lower unemployment rates than the less advanced states. Between 1982 and 2019, average unemployment rates were 2.8% for Group A and 2.5% for Group B, slightly higher for Groups C and D at 4.7% and 3.2% respectively. Unemployment rates for women, rural, less educated and younger individuals were also consistently higher for Group C states in East Malaysia compared to other states—underscoring the need to generate job opportunities and decent work there.

Median and mean monthly wages, 2019



Note: Refer to wages of citizens only.
Source: DOS (2019f), KRI calculations

Annual value added and total wages paid per employment, by firm type, 2015



Source: DOS (2016a), DOS (2017a), KRI calculations

Unemployment rate, by demographic characteristic and state group, 2019

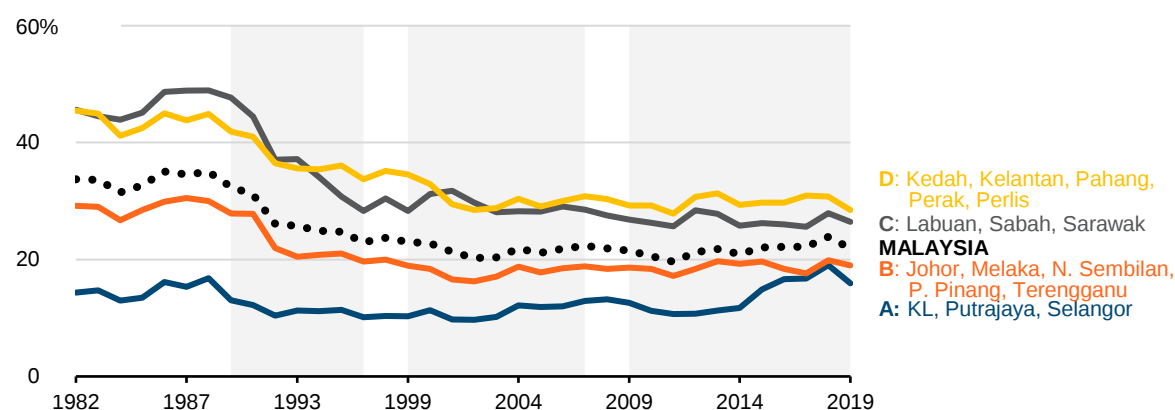
	MALAYSIA	Group A	Group B	Group C	Group D
Women	3.4%	2.7	2.5	5.0	4.0
Men	3.2	2.9	2.6	4.6	2.8
Gender ratio	1.1	1.0	1.0	1.1	1.5
Rural	3.2	2.9	2.9	3.3	3.2
Urban	3.3	2.8	2.5	5.5	3.3
Strata ratio	1.0	1.0	1.2	0.6	1.0
Non-tertiary	3.0	2.8	2.3	4.2	2.6
Tertiary	3.9	2.8	3.0	7.2	5.0
Education ratio	0.8	1.0	0.8	0.6	0.5
Youth (15 – 24)	10.5	10.0	8.2	12.5	10.9
Adult (25 – 64)	1.7	1.8	1.4	2.2	1.4
Age ratio	6.3	5.7	6.0	5.7	7.9
Overall	3.3	2.8	2.5	4.7	3.2

Note: Ratios are computed by dividing the first listed sub-group over the second, e.g., women over men. When larger than 1, the unemployment rate for the first listed sub-group is higher than the second, e.g., with the gender ratio of 1.5, the women's unemployment rate is higher than the men's rate in Group D.

Source: DOS (2020c), KRI calculations

While paid employment is higher in Groups A and B states, vulnerable employment has been on the rise. In 2019, close to 80% of total employed persons in Groups A and B states were in paid employment, typically with standard employer-employee relationships, slightly less in Groups C (71.0%) and D (68.1%). However, vulnerable employment, defined as a proportion of *own account workers* and *unpaid family workers* out of total employed persons, has expanded in Groups A states in the past decade. This indicates that although from a long-term standpoint, labour market conditions appear to be largely stable, a share of the workforce still faces *decent work deficits* even in the economically advanced states.

Vulnerable employment share, by state group, 1982 – 2019

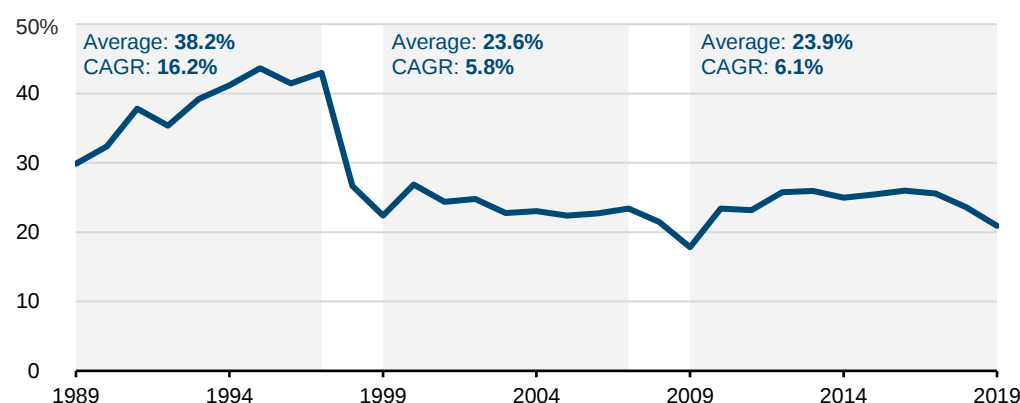


Note: Data unavailable for 1991 and 1994. Shaded regions cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively. Vulnerable employment includes *own account workers* and *unpaid family workers*. Source: ILO (2018b). Source: DOS (2020b), KRI calculations

Investments, technology and other shocks such as the Covid-19 pandemic shapes the labour market as well

Investments grew rapidly during industrialisation but moderated as the economy became more services oriented. Between 1989 and 1997, capital formation expanded by 16.2% annually. But with deindustrialisation, capital growth moderated to 5.8% per year between 1999 and 2007, and only recovered slightly to 6.1% per year between 2009 and 2019. Accumulation of tangible capital also tended to concentrate less in high-technology manufacturing and “modern services”. Lack of intangible capital investment (e.g., research and development activities) also dampened the demand for skilled workforce. Although labour income share has increased in recent years (marginally), slow growth of investment might impede sustainable long-term economic growth.

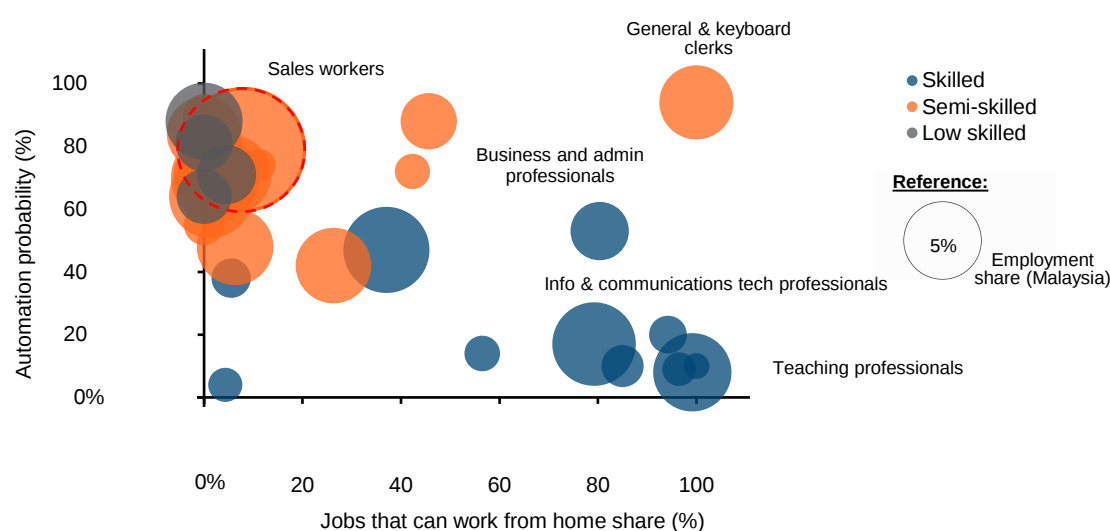
Capital formation per GDP share, 1989 – 2019



Note: Shaded areas refer to Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2018) respectively. Values displayed in constant RM. Source: World Bank (n.d.b), KRI calculations

Around half of jobs, mostly semi-skilled, were estimated to be at high risk of being automated, and Covid-19 may further accelerate automation. Sales workers, who make up the largest share of total employment, are at a high risk of automation. By contrast, teaching and health professionals are likely to be least affected. This further aggravate worries related to the expansion of “traditional services” and the contraction of “modern services”, education and health-related services employment, observed in the past decade. Moreover, Covid-19 might accelerate the automation risks for some jobs, as they cannot shift to be home-based during the pandemic. However, lags in technological adoption provide opportunities for policy intervention to ensure that workers can be up- or reskilled to complement technological advancement, rather than be displaced. Youth optimism and willingness to adopt new technologies could also support the transition to the new economy.

Automation probability versus jobs that can work from home share and Malaysia’s employment share, by occupation



Note: Automation probability refers to computerisable probability estimated based on US 2013 employment data, jobs that can work from home share estimated based on US 2020 employment data (higher share means the job is more likely to survive Covid-19 as they can continue working from home when countries implement containment measures). Bubble sizes indicate Malaysia’s share of employed persons in 2016.

Source: KRI calculations based on data cited in KRI (2017a), Dingel and Neiman (2020)

Household wellbeing is closely tied to overall economic development, and policies should consider the synergy between workers and other developments in the economy

Malaysia's development plans have continuously focused on regional development, albeit to varying degrees of importance. These policies depend on the advantages and available resources of certain areas, but outcomes for workers and households differ because of the uneven concentration of various economic activities in different regions.

Narrowing regional disparity ultimately boils down to sector-specific productivity improvements, and how they alter regional income distribution. Continuous assessment of regional policies, as well as coherent and sound industrial policies are key to addressing relevant gaps among workers and households in different parts of the country.

Beyond spatial consideration, there are potential trade-offs revolving technological advancement and structural transformation policies. Job displacement that might occur as firms advance to automate and modernise must be addressed, to ensure all workers can continue to participate actively in the modern and digital economy. Moreover, embarking on structural transformation to prioritise certain sectors should consider the potential rise of income disparities between and within industries, as some high paying sectors also exhibit higher income inequalities.

INTRODUCTION

“While the years ahead will undoubtedly bring new changes, the dependence on work for one’s livelihood and the effect of work on a person’s overall well-being will not change”

International Labor Organization (ILO)

INTRODUCTION

Work in an Evolving Malaysia is the second report of a three-part series under Khazanah Research Institute's (KRI) flagship publication *The State of Household 2020 (SOH2020)*. Part I of SOH2020, *Welfare in Malaysia Across Three Decades* analyses the well-being of Malaysian households in conjunction with the publication of the Household Income and Expenditure Survey (HIES) 2019 by the Department of Statistics (DOS), as well as the long-term trends over the last three decades from 1989 to 2019. Part I also analyses social welfare by examining household income in the context of poverty and inequality. Then, it goes beyond the household survey data to analyse the state of household within the production structure of the economy to elucidate the impact of structural change on households.

In Part II of SOH2020, *Work in an Evolving Malaysia*, we focus on the work of household, considering the fact that employment-related earnings constitute the largest share of household income. Earnings from paid employment continued to be the largest source of household income, although its share had steadily declined from 66.6% to 61.6% between 2012 and 2019. Meanwhile, the share of household income from self-employment remained flat at around 17.0% during the same period, despite the rising number of self-employed workers in recent years. In 2019, close to 80% of household income was from paid and self-employment earnings, and the relationship between household income level and employee wages was found to be positive and highly correlated.

In this context, it is important to understand the link between structural changes of the economy and how they affect the conditions of the labour market and the types of jobs created for households, as it significantly contributes to their economic well-being. Given our economic progress, the nature of work continues to evolve in tandem with changes in our economic structure, demographic shift, globalisation and technological advancement.

The discourse on the health of households is deliberated more thoroughly in Part III of SOH2020, *Social Inequalities and Health in Malaysia*. The publication looks at health beyond the question of access to healthcare services and examines the state of the nation's health, distribution of health among households of different income groups, as well as the relationship between work and health.

This publication is divided into three sections, as follows:

Section 1: Economic Structure and Regional Development

The first section is anchored on the evolution of Malaysia's economic structure and how it has shaped employment at state level. Based on the findings in Part I SOH2020, noting the persistent household income gap among states in Malaysia, this section highlights the changes in the economic structure of states and federal territories in Malaysia over the last three decades from 1989 to 2019.

Section 2: Labour Market Outcomes and Decent Work

The second section looks at labour market outcomes at different locations in the country as the economic structure evolved. It begins by featuring the workforce demographic landscape, before analysing various labour market outcomes in different states. This section also emphasises the importance of *decent work* and conducive working conditions in improving the quality of life of our workforce.

Section 3: Capital, Technology and Work

The final section illustrates the evolution of capital accumulation as the country develops and contextualises the synergies between labour and capital with the changing economic structure. The section also discusses the opportunities (or threats) of technology in shaping the future of work. Finally, as Covid-19 hits the country in 2020, we briefly discuss the potential challenges created by the pandemic on the world of work.

SECTION

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ECONOMIC STRUCTURE AND REGIONAL DEVELOPMENT

Households' economic well-being is linked to economic activities as employment in various jobs become a major source of income for many households. In 2019, employment-related incomes made up more than 80% of household income. However, economic structure and level of developments are different in various parts of the country, leading to different realities faced by our workforce and households. Taking a regional perspective, this section discusses the evolution of economic and employment structure in different states in Malaysia across three decades (1989 to 2019), adding nuance to the narrative of Malaysia's development.

1.1 Structural Changes of the Malaysian Economy

Improvements in the conditions of households over the decades have been linked to the economic development and transformation of the nation. Economic growth, crudely measured by gross domestic product (GDP), is the basis for improved household socioeconomic well-being. Although the benefits of economic growth may not necessarily trickle down to everyone, growth has transformed the country and reduced the poverty level at a significant scale. Economic growth provided resources to redistribute and invest in education, health, infrastructure and other aspects of development¹.

Underlying development since independence in 1957 was the evolution in production structure and use of resources (labour and capital) from agriculture to manufacturing (industrialisation) in the 1980s and 1990s. Since the 2000s, services expanded as manufacturing activities moderated (deindustrialisation)².

Following the framework described in Part I of The State of Households 2020 (SOH2020), this report focuses on the evolution of the labour market over the last three decades from 1989 to 2019, roughly coinciding with the Vision 2020 period. Table 1.1 shows the breakdown of the three decades into three major periods against the backdrop of changing economic structure.

Table 1.1: Malaysian economic development, by period

Period	Year	Phase	Description
1	1989 – 1997	Industrialisation	Industrialisation, before the Asian financial crisis (AFC) 1997/98
2	1999 – 2007	Deindustrialisation	The start of deindustrialisation, before the global financial crisis (GFC) 2007/08
3	2009 – 2019	Moderated deindustrialisation	The continuance but moderation of deindustrialisation, post-GFC

Note: KRI (2017b) marked industrialisation between 1970 and 2000; KRI (2018a) marked industrialisation as between 1986 and 1999.

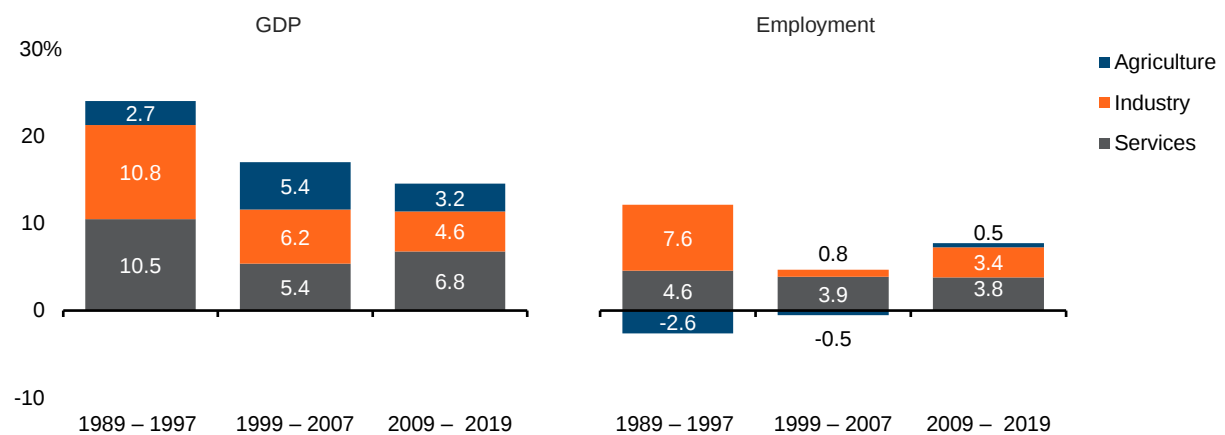
Source: KRI illustration

¹ KRI (2018c)

² Ibid.

Figure 1.1 shows annual growth (CAGR) of gross domestic product (GDP) and employment by economic activities reflecting the country's structural change. Between 1989 and 1997, agricultural output grew modestly at 2.7% yearly, while agricultural employment contracted by 2.6% yearly; from employing 28.7% of the workforce in 1989 to 17.3% in 1997. By 2019, agriculture contributed 7.3% to GDP and only 10.2% to total employment. Meanwhile, industrial employment expanded rapidly by 7.6% per year with the share increased from 24.7% of total employment in 1989 to 33.1% in 1997, supporting impressive output growth. However, the growth of industrial output and employment moderated after the AFC, before recovering slightly after the GFC.

Figure 1.1: GDP and employment annual growth, by economic activity, 1989 – 2019

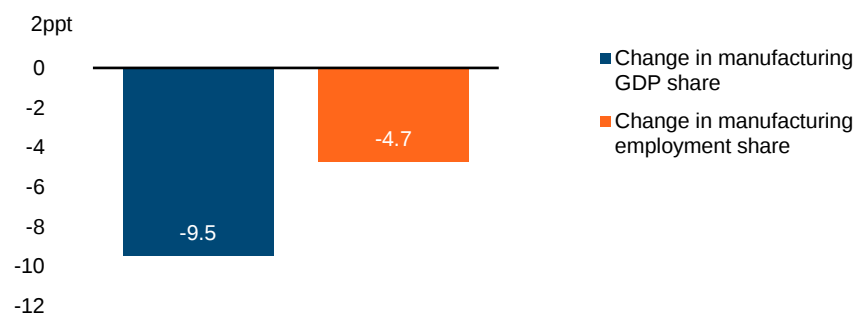


Note: GDP figures in 2010 prices. Agriculture refers to *Agriculture, forestry & fishing*. Industry refers to *Manufacturing, Mining & quarrying* and *Construction*, of which manufacturing is dominant.

Source: CEIC (n.d.), DOS (2020b), KRI calculations

Malaysia's deindustrialisation is said to be "premature", with the economy shifting away from industrial activities due to its declining competitiveness³. Figure 1.2 shows the decline of manufacturing's output share was larger than the decline of its employment share between 1999 and 2019⁴. In 1999, manufacturing made up 30.9% of GDP and 22.5% of total employment, but by 2019, the sector contributed 21.5% to GDP and 17.8% to total employment.

Figure 1.2: Change in manufacturing GDP and employment share, 1999 – 2019



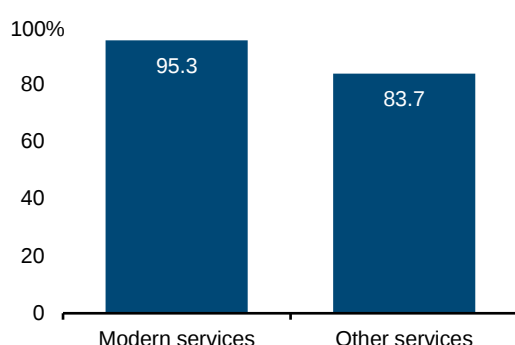
Source: CEIC (n.d.), DOS (2020b), KRI calculations

³ Rodrik (2015). On Malaysia, see BNM (2019), Menon and Ng (2015), Rajah Rasiah, Crinis, and Lee (2014).

⁴ Adapted from BNM (2019)

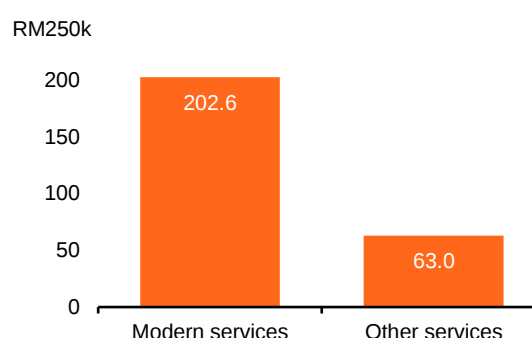
Following deindustrialisation, the economy shifted to services, which accounted for 62.9% of total employment and 56.9% of GDP in 2019. Services are a heterogeneous economic activity; there are *modern services*, often referring to four subsectors: (1) *finance and insurance*, (2) *information and communication technology*, (3) *real estate*, and (4) *professional, scientific and technical services*⁵. These activities tend to be based in urban areas (Figure 1.3), with higher output value per employment, suggesting higher productivity compared to *other services* (Figure 1.4). They also employ a larger share of skilled employed persons and tend to pay more compared to *other services*.

Figure 1.3: Services urban employment share, by subsector, 2015 – 2019 average



Source: DOS (2020b), KRI calculations

Figure 1.4: Services GDP per employment, by subsector, 2015 – 2019 average



Note: GDP in constant 2015 prices.

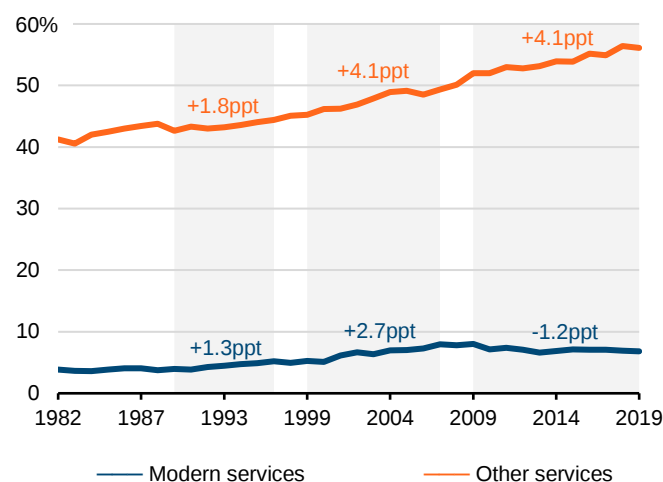
Source: CEIC (n.d.), DOS (2020b), KRI calculations

In 1982, *modern services* constituted only 3.9% of total employment, while *other services* accounted for 41.3% (Figure 1.5). Over the years, *other services* employed increasing shares of workers in the country and made up 56.1% of total employment by 2019. After the AFC, *other services* employment share expanded by more than 4.0 percentage points from 45.2% of total employment in 1999 to 49.3% in 2007, while *modern services* expanded modestly at 2.7 percentage points from 5.3% to 8.0%. In the last decade, *other services* continued to employ larger shares of employed persons and expanded from 52.0% of total employment in 2009 to 56.4% in 2019 (4.1 percentage points) but *modern services* employment share contracted from 8.0% to 6.9% (1.2 percentage points) in the same period.

Although employment growth in *modern services* was modest, the value of its output was much higher compared to *other services* as illustrated in Figure 1.4. As the country deindustrialised in the last two decades (1999 to 2019), the employment share of *modern services* expanded by 1.5 percentage points from 5.3% of total employment to 6.8%, and its output share increased by 3.1 percentage points from 12.7% of total GDP to 15.8% (Figure 1.6). In the same period, *other services* employment share expanded by 10.9 percentage points from 45.2% of total employment to 56.1%, but its output share only increased by 1.2 percentage points from 38.3% of total GDP to 39.5%. Essentially, although *other services* provided employment for many (56.1% of total employment in 2019), the value added derived from these activities was limited (39.5% of GDP in 2019), relative to *modern services*.

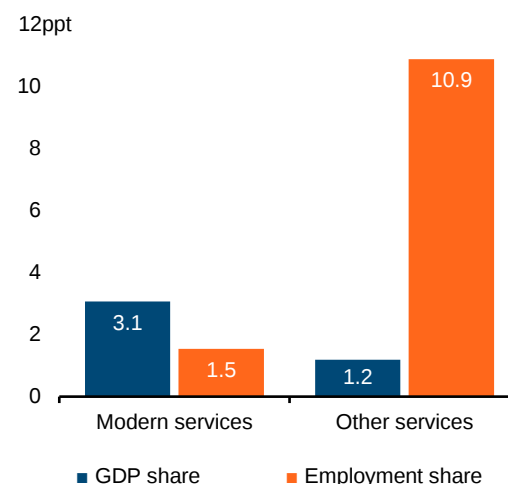
⁵ Based on the classification used in Ng, Tan, and Tan (2018), see Table B.2 in Appendix B for more details.

Figure 1.5: Services employment share, by subsector, 1982 – 2019



Note: Shaded areas cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively.
Source: DOS (2020b), KRI calculations

Figure 1.6: Change in services GDP and employment share, by subsector, 1999 – 2019



Source: CEIC (n.d.), DOS (2020b), KRI calculations

1.2 Regional Economic Development

Malaysia's structural economic changes are often discussed at the national level, but as noted in Part I SOH2020, income gaps among states remain. As such, it is useful to look at economic structural changes at the state level to understand labour market outcomes in different locations.

Regional economic development has long been part of the government's development agenda albeit with varying degrees of importance, as noted by Hutchinson (2016). Regional planning shifted from rural development post-independence to creating regional zones during the 1970s. Between 1990 and 2005, it shifted to be state-specific, and since 2006, focused more on the development of urban areas⁶.

In the 10th and 11th Malaysia Plans, regional economic development policies were revived—Kuala Lumpur is envisioned as the primary hub of high-quality investments, alongside other cities like George Town, Johor Bahru and Kota Kinabalu. The Northern Corridor Economic Region promoted agriculture, manufacturing, tourism, logistics and education. In the East Coast Economic Region, focus has been placed on petrochemicals, manufacturing and tourism. Iskandar Malaysia in the south is to be a hub for the creative industries, education, tourism, logistics and manufacturing. In Sabah and Sarawak, energy-intensive and resource-based industries have been prioritised. Meanwhile, in the Shared Prosperity Vision 2030, each state is expected to have different economic priorities, shifting slightly from the regional planning of the two previous Malaysia Plans.

⁶ Hutchinson (2016). See page 40 in KRI (2020) for discussion on development plans.

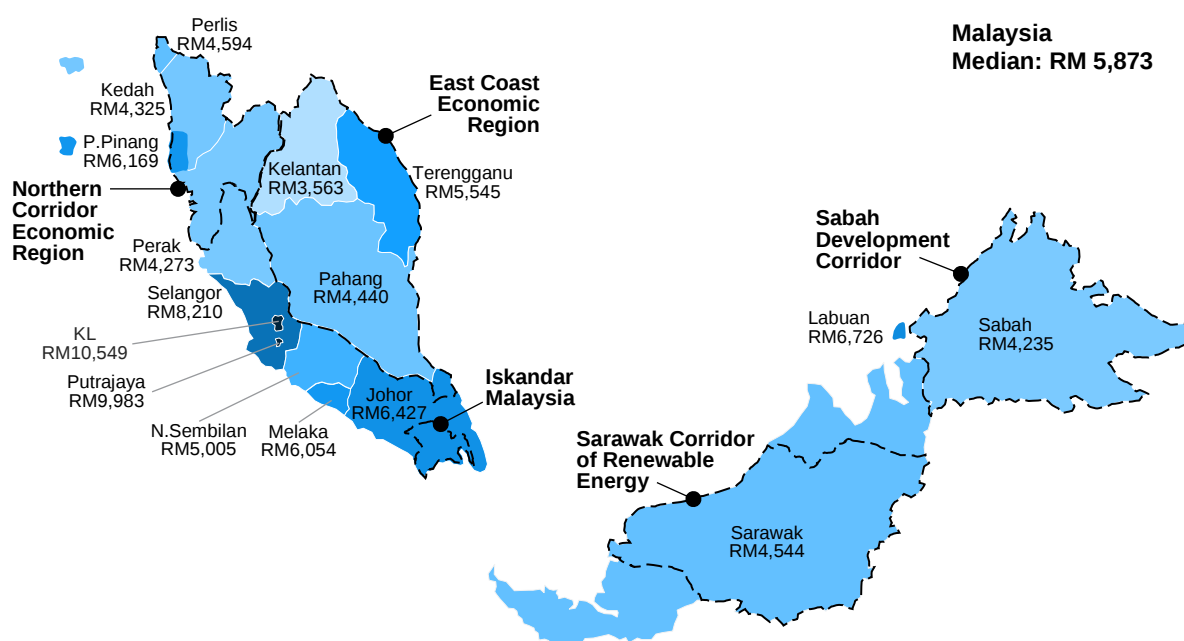
To examine development trends in different parts of the country, states and federal territories are grouped based on household income (Table 1.2). Geographically, states in Groups A and B tend to be at the centre of the economic regions in the Peninsular Malaysia, surrounded by states in Group D. Meanwhile, Group C consists of states in East Malaysia i.e., Sabah, Sarawak and Labuan (Figure 1.7).

Table 1.2: State grouping, by household income, 2019

Group	States	Description
A	Kuala Lumpur, Putrajaya, Selangor	- Mean and median household income higher than 30% of national level in 2019 - Peninsular states
B	Johor, Melaka, Negeri Sembilan, Pulau Pinang, Terengganu	- Mean and median household income around national level ($\pm 20\%$) in 2019 - Peninsular states
C	Labuan, Sabah, Sarawak	States in East Malaysia
D	Kedah, Kelantan, Pahang, Perak, Perlis,	Mean and median household income below national level in 2019 and other Peninsular states not in A or B

Source: DOS (2020a), KRI classification and calculations

Figure 1.7: Regional economic group and median household income, 2019



Note: Economic region based on EPU (2018). Map not to scale.

Source: DOS (2020a)

1.2.1. Decline of agricultural activities

While employment in agricultural activities (agriculture, forestry and fishing) at national level was about 31% of total employment in 1982, its importance has been different for various state groups. Agricultural employment was more prevalent in Group C (47.3% of total employment) and Group D (40.2%) states, and relatively less important in Groups A (9.8%) and B (28.5%) in 1982 (Figure 1.8). During industrialisation (Period 1, 1989 – 1997), agricultural employment contracted in all states, except Sabah and Labuan, which grew by 6.6% and 12.9% per year respectively. Agricultural employment contraction continued between 1999 and 2019 (Period 2 and 3), though it remained growing for some states compared to others (Figure 1.10).

Figure 1.8: Agricultural employment share, by state group, 1982 – 2019

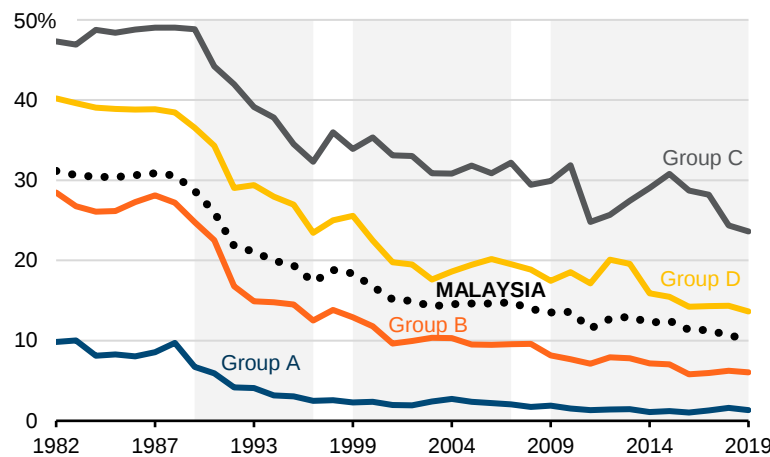
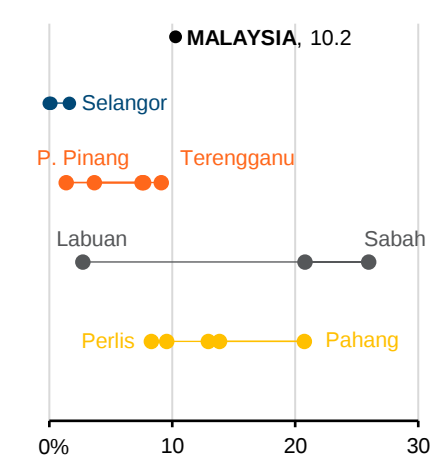


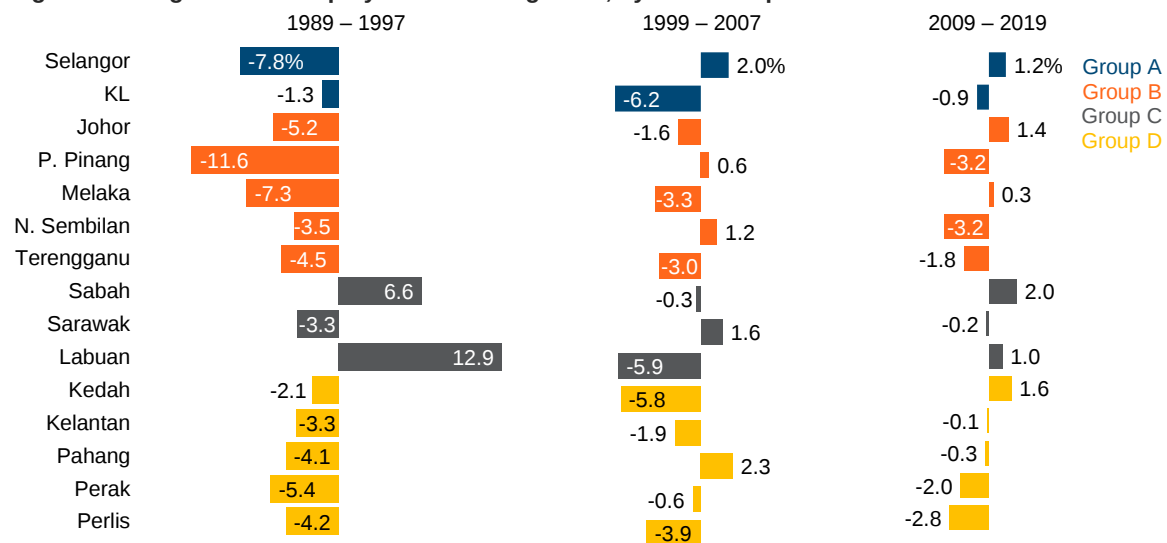
Figure 1.9: Agricultural employment share, by state, 2019



Note: Data unavailable for 1991 and 1994. Shaded areas cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively.

Source: DOS (2020b), KRI calculations

Figure 1.10: Agricultural employment annual growth, by state and period

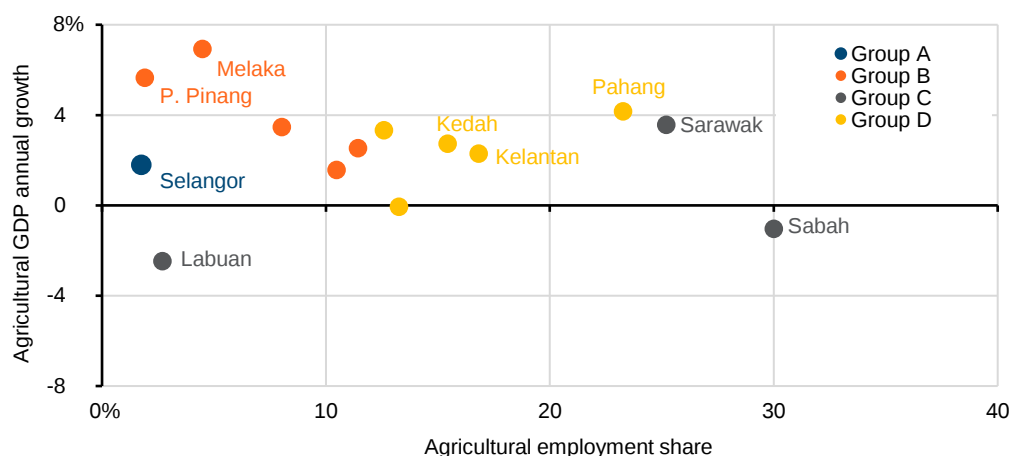


Note: Excludes Putrajaya as data only available since 2010.

Source: DOS (2020b), KRI calculations

Over time, agriculture employment declined but it is still relatively important for most states in Groups C and D, as high as 26.0% in Sabah and 20.8% in Pahang in 2019 (Figure 1.9). However, they tend to have slower productivity levels (GDP per employment) compared to states less concentrated in agricultural activities (Figure 1.11)

Figure 1.11: Agricultural GDP annual growth and average employment share, by state, 2009 – 2019



Note: Data in 2010 prices. Exclude KL and Putrajaya due to very low values of agricultural value added and employment.
Source: CEIC (n.d.), DOS (2020b), KRI calculations

Additionally, agriculture has consistently reported a higher incidence of fatal injuries⁷. In some agricultural activities, safe practices while using chemicals were also neglected, risking the health and safety of agricultural workers and farmers, among others⁸. Moreover, this sector also has a higher proportion of non-standard workers, likely unprotected by mandatory social protection schemes such as employment-related injury insurance. Essentially, *decent work* deficit is relatively higher in agriculture and its concentration in less developed states could indicate that work in some parts of the country is more precarious.

1.2.2. Uneven industrialisation among states

Industrial employment was more common for states in Groups A and B. In 1982, it made up 31.9% and 28.0% of total employment in Groups A and B respectively, while the shares were just 15.7% and 20.2% in Groups C and D⁹. As manufacturing constitutes the highest share of industrial employment, this section will focus on manufacturing employment.

⁷ Nur Thuraya and Siti Aisyah (2020)

⁸ KRI (2019a)

⁹ KRI calculations based on DOS (2020b). Calculations for Group A excluded Putrajaya and Group C excluded Labuan.

During industrialisation between 1989 and 1997, the rise of manufacturing employment share was the largest for states in Group C (8.7 percentage points, from 7.5% to 16.2%), followed by Group B (5.9 percentage points, from 24.9% to 30.8%), Group D (5.6 percentage points, from 14.7% to 20.3%) and Group A (1.1 percentage points, from 23.2% to 24.3%) (Figure 1.12). Growth of manufacturing employment was also quite high for some states in Groups C and D during this period. For example, manufacturing employment in Sabah grew by 23.7% per year and in Kedah by 12.0% per year (Figure 1.14). This implies that among non-manufacturing states (manufacturing employment shares less than ~20%), the sector grew more rapidly during industrialisation, although it never reached the magnitude of Group B states by the end of the industrialisation period.

Figure 1.12: Manufacturing employment share, by state group, 1982 – 2019

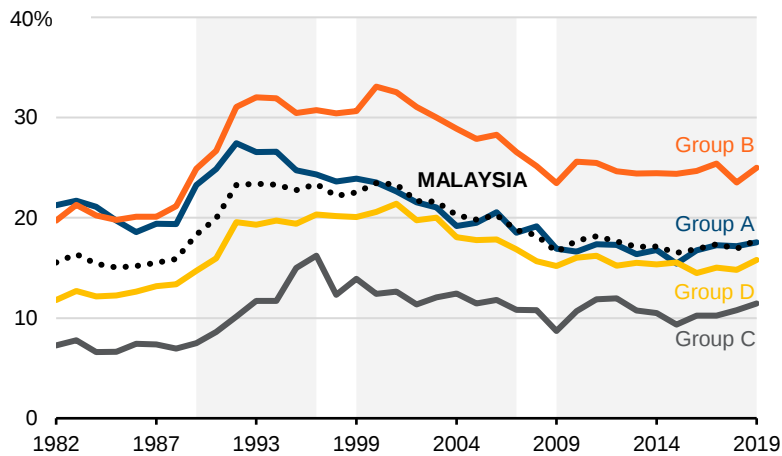
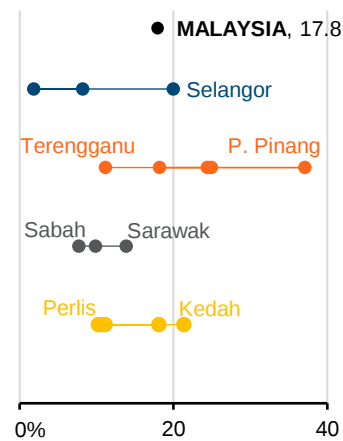


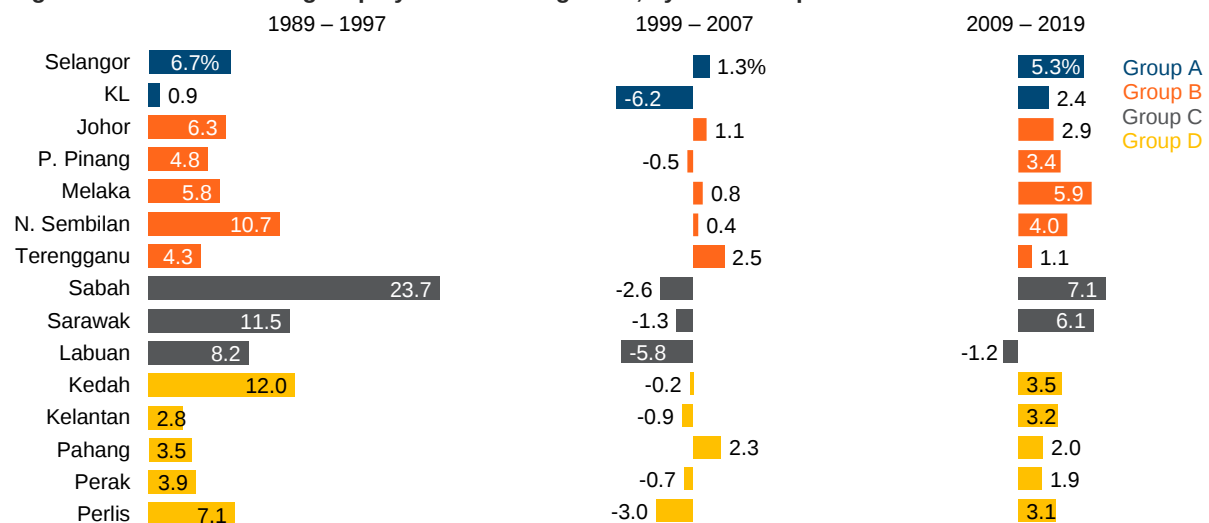
Figure 1.13: Manufacturing employment share, by state, 2019



Note: Data unavailable for 1991 and 1994. Shaded areas cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively.

Source: DOS (2020b), KRI calculations

Figure 1.14: Manufacturing employment annual growth, by state and period

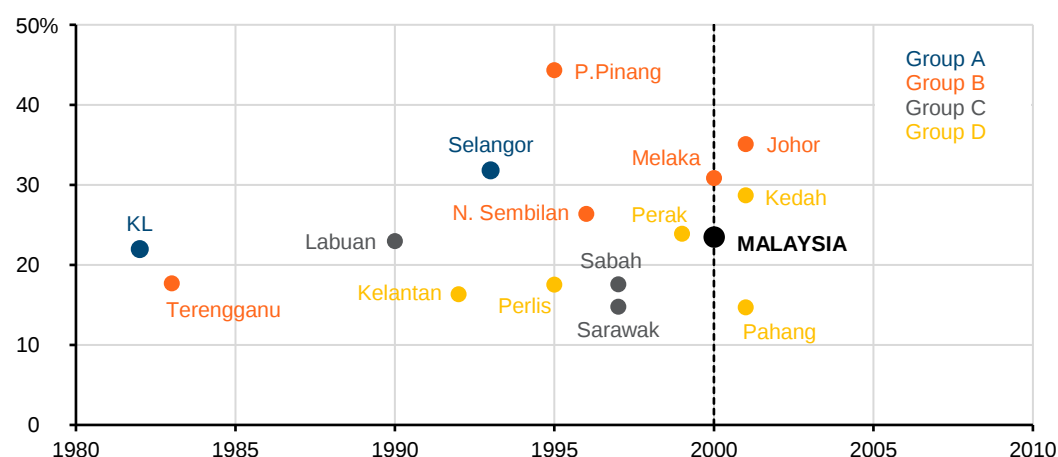


Note: Excludes Putrajaya as data only available since 2010.

Source: DOS (2020b), KRI calculations

After rapid industrialisation phase in 1989 to 1997, the subsequent years saw much more modest manufacturing employment growth, as the services sector expanded. At the national level, manufacturing employment share peaked at 23.5% of total employment in 2000, before declining to 17.8% in 2019. However, for most states, manufacturing employment within the state peaked before 2000 (Figure 1.15), indicating that deindustrialisation at the state level occurred before the year suggested by national figures. For example, Kelantan reached its peak manufacturing employment (16.3%) in 1992, while Terengganu reached its peak (17.7%) in 1983. Additionally, “developing” states reached their peak manufacturing at lower income levels than “developed” states¹⁰. Since 2009, there has been modest manufacturing employment growth in most states, expanding at 3.4% per year on average between 2009 and 2019, compared to 7.5% per year on average between 1989 and 1997 (Figure 1.14)¹¹.

Figure 1.15: Peak manufacturing employment share, by state and year



Note: Excludes Putrajaya as data only available since 2010.
Source: DOS (2020b), KRI calculations

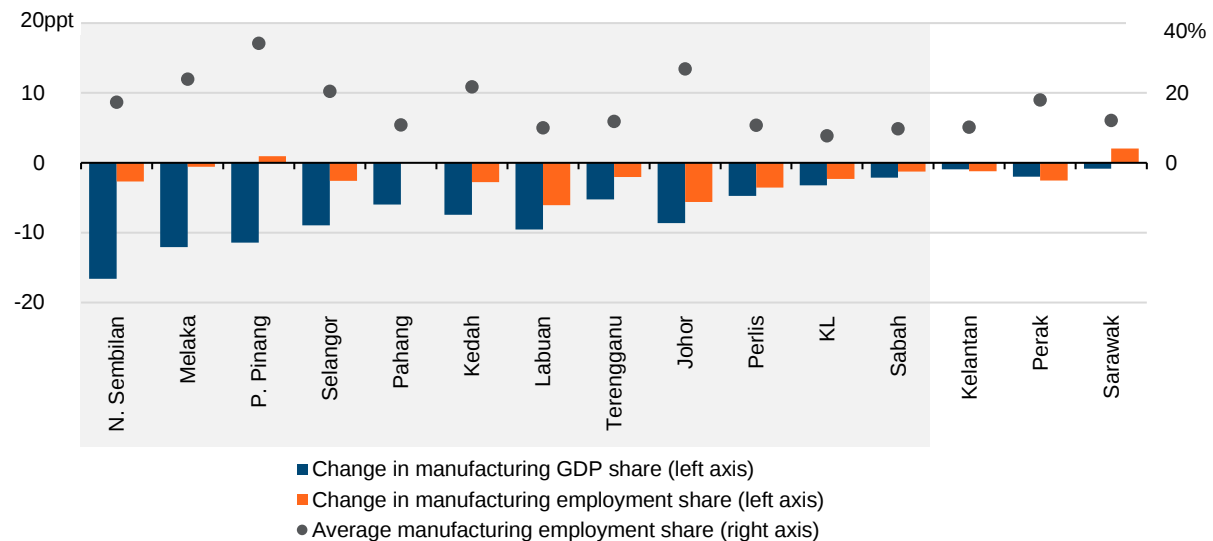
The key question is whether states were deindustrialising prematurely, i.e., was the decline in manufacturing employment the result of declining competitiveness rather than technological improvements?

Due to data limitations, we cannot observe manufacturing output by states prior to 2005. However, analysing trends between 2005 and 2019 shows the variations in deindustrialisation experiences. Figure 1.16 suggests that most states experienced premature deindustrialisation, with the largest declines in competitiveness (proxied by the gap between declines in manufacturing output and employment shares) experienced by Negeri Sembilan, Melaka and Pulau Pinang. The experience was more modest in KL and Sabah. Meanwhile, the decline in manufacturing employment was larger than output decline in Sarawak, Perak and Kelantan, although manufacturing employment was not dominant in these states.

¹⁰ See Appendix A.

¹¹ BNM (2019) found that deindustrialisation moderated after 2010 due to some recovery in the electrical and electronics (E&E) industry.

Figure 1.16: Change in manufacturing GDP share, change in manufacturing employment share and average manufacturing employment share, by state, 2005 – 2019



Source: CEIC (n.d.), DOS (2020b), KRI calculations

It is also important to recognise that manufacturing is heterogenous in nature. High-technology manufacturing, which includes E&E products and transport equipment, accounted for close to 60.3% of the country's manufacturing exports¹². High-technology manufacturing also accounted for 36.1% of total manufacturing GDP, second to mid-technology manufacturing (42.8%)¹³. In 2017, it also employed higher proportions of skilled employed persons, at 23.7% of total employment in the subsector (Figure 1.17), and had higher average pay at more than RM38,000 per year, compared to other manufacturing subsectors (Figure 1.18).

Figure 1.17: Manufacturing employment share, by subsector and skill level, 2017

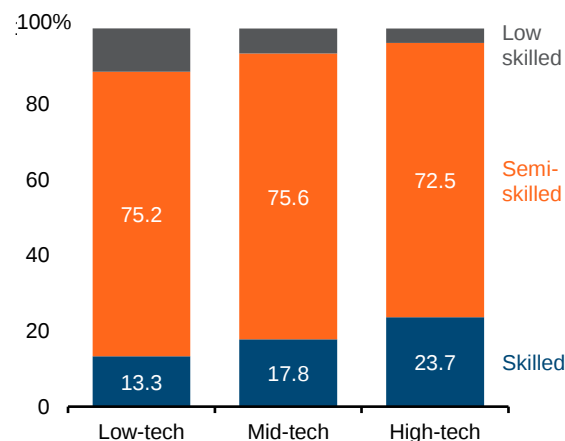
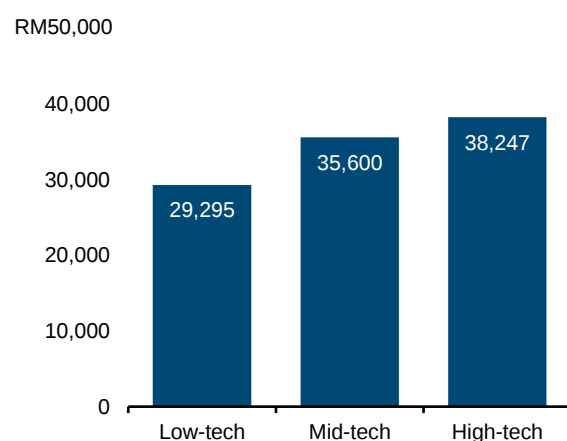


Figure 1.18: Manufacturing annual total wages per employment, by subsector, 2017



Note: Categorisation of manufacturing activities based on Ng, Tan, and Tan (2018).

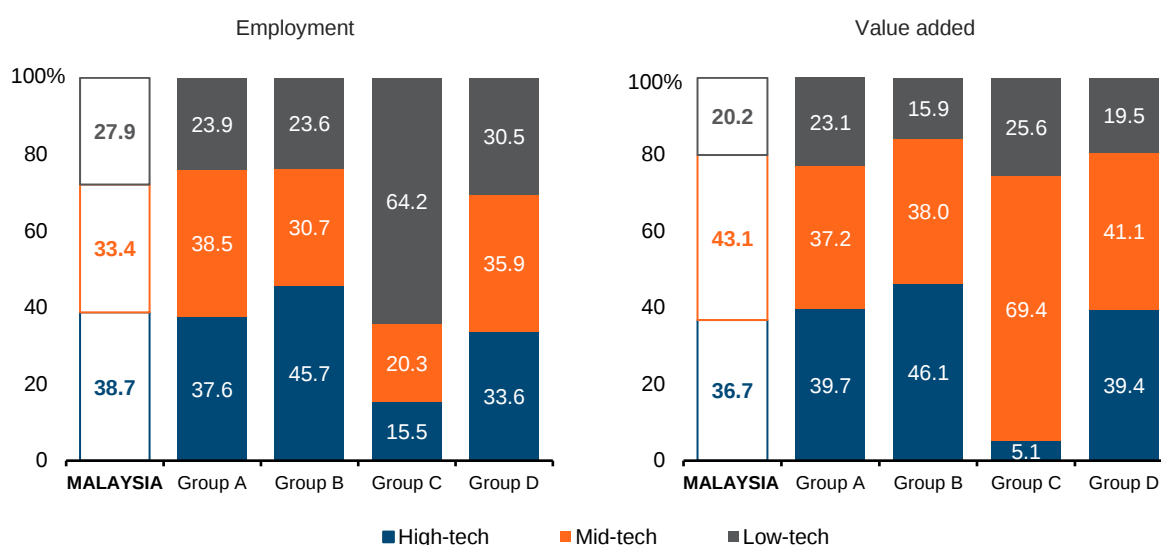
Source: DOS (2019a), KRI calculations

¹² CEIC (n.d.)

¹³ Ibid. Categorisation based on Ng, Tan, and Tan (2018)

At the national level, high-technology manufacturing accounted for 38.7% of total manufacturing employment and 36.7% of total manufacturing value added. However, it was more concentrated in Groups A and B, while mid-technology and low-technology manufacturing was more prevalent in other states. For example, in Group C, employment share in high-technology manufacturing was 15.5% of total manufacturing employment in the state group, a sharp contrast to 64.2% for low-technology manufacturing. However, a large share of Group C's manufacturing value added was contributed by mid-technology manufacturing (Figure 1.19)¹⁴.

Figure 1.19: Manufacturing employment and value added share, by subsector and state group, 2015



Source: DOS (2017a), KRI calculations

Despite the observed decline of manufacturing employment as the country deindustrialises, the sector remains important. Especially for “catching-up” states, manufacturing serves as an essential economic activity that provides productive employment with better pay. The sector is also more technologically dynamic¹⁵, utilising more educated workers, which suggests tangible and sustainable productivity improvements in this sector.

¹⁴ *Mid-technology* manufacturing refers to manufacturing of petroleum, chemical, rubber, plastic, non-metallic mineral, basic metal and fabricated metal products. *Low-technology* manufacturing refers to manufacturing of food, beverages, tobacco, textiles, wearing apparel, leather, wood, furniture, paper and printing products. Adapted from Ng, Tan, and Tan (2018)

¹⁵ KRI (2017b)

1.2.3. Shift to services

As discussed in Section 1.1, services can be divided into *modern services* and *other services*¹⁶. In 2019, 6.8% of employed persons in Malaysia worked in *modern services*, but this subsector contributed 15.8% of total GDP. On the other hand, although more than half of the workforce was employed in *other services* subsectors (56.1% total employment), their value added was less than half of total GDP (39.5%)¹⁷. Evidently, Group A's share of *modern services* employment was far higher compared to other state groups. In 2019, employment in *modern services* accounted for 14.6% of total employment in Group A, while its share was only between 3.0% and 4.7% for others, and the Malaysian average was at 6.8% (Figure 1.20). Meanwhile, *other services* employment shares were relatively similar among the four groups, the highest for Group D (59.4%) in 2019 (Figure 1.22). In fact, there has been a general convergence of shares of employment in *other services* between all state groups, but not for *modern services*.

Figure 1.20: Modern services employment share, by state group, 1982 – 2019

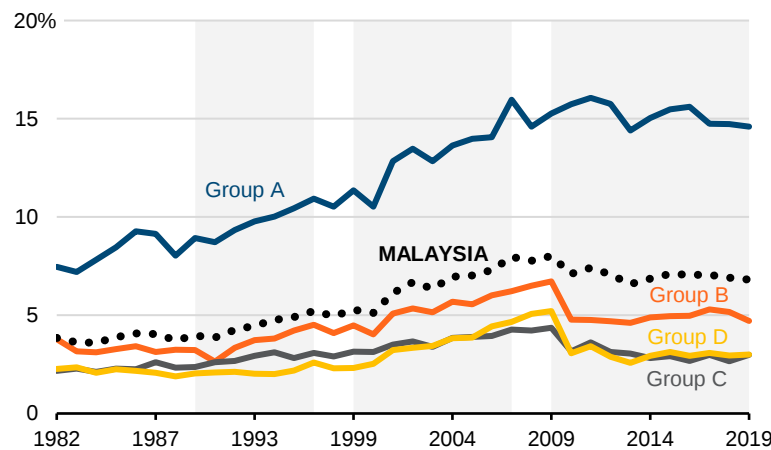


Figure 1.21: Modern services employment share, by state, 2019

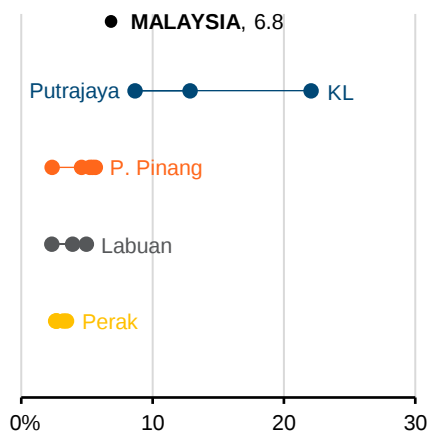


Figure 1.22: Other services employment share, by state group, 1982 – 2019

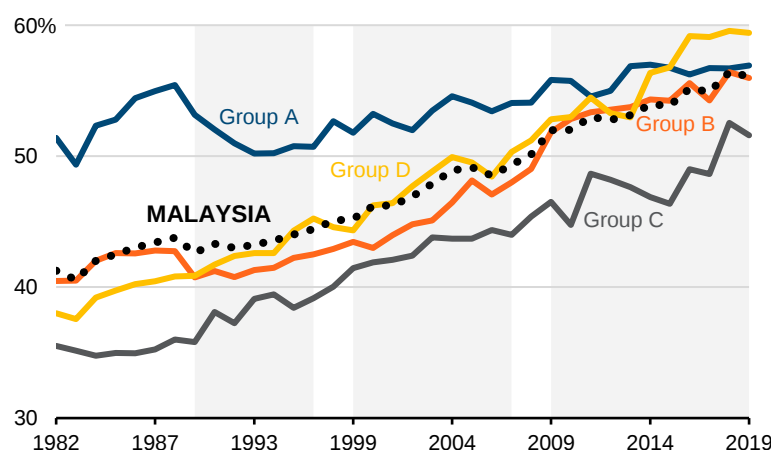
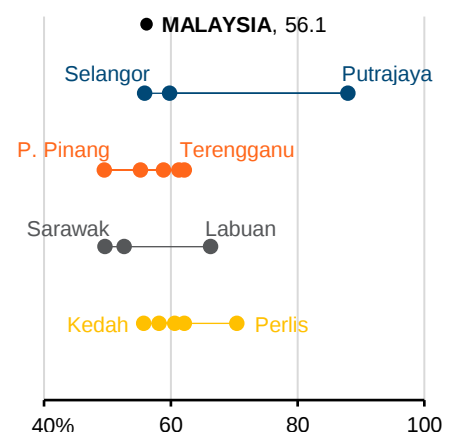


Figure 1.23: Other services employment share, by state, 2019



Note: Data unavailable for 1991 and 1994. Shaded areas cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively.

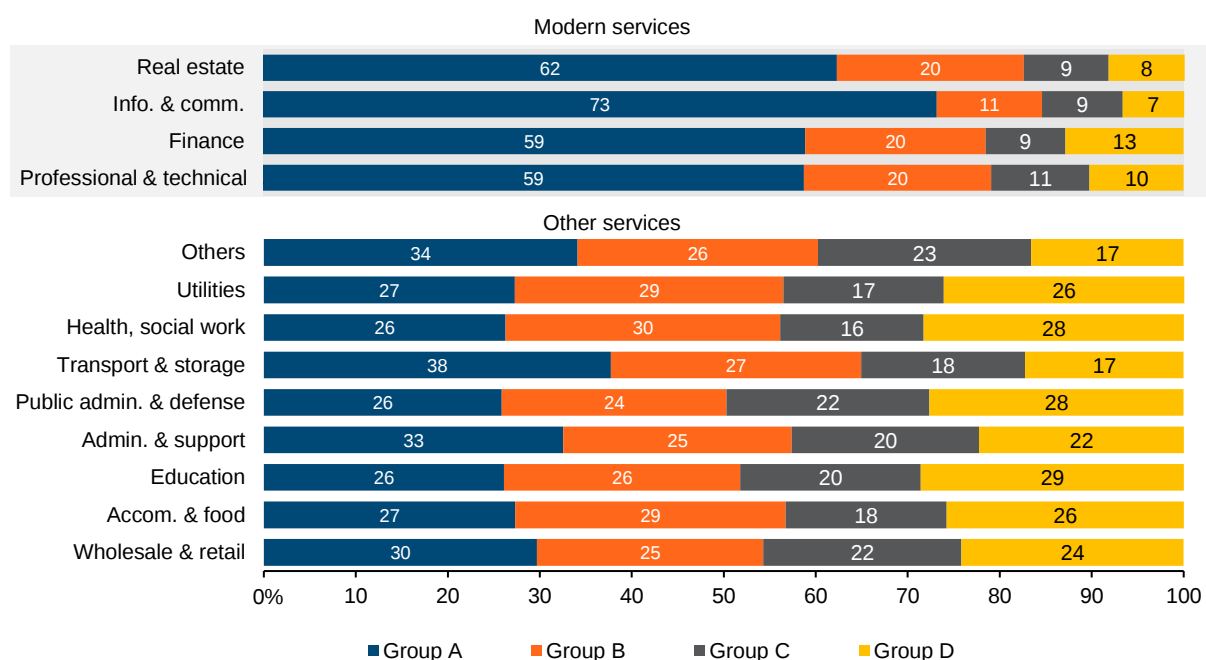
Source: DOS (2020b), KRI calculations

¹⁶ See Table B.2 in Appendix B for more details.

¹⁷ CEIC (n.d.), DOS (2020b), KRI calculations

In *modern services*, most employment was in *professional, scientific and technical (PST)* services, followed by *finance*, which employed 385,700 and 335,100 employed persons, or 37.6% and 32.6% of *modern services* total employment respectively in 2019. In *other services*, employment was mainly in the *wholesale and retail trade* services (2.59 million employed persons or 30.7% of *other services* total employment), followed by *accommodation and food services* (1.55 million employed persons or 18.3% of *other services* total employment). While more than half of *modern services* employment was located in Kuala Lumpur, Selangor and Putrajaya (Group A), the distribution of *other services* employment was similar across the country (Figure 1.24).

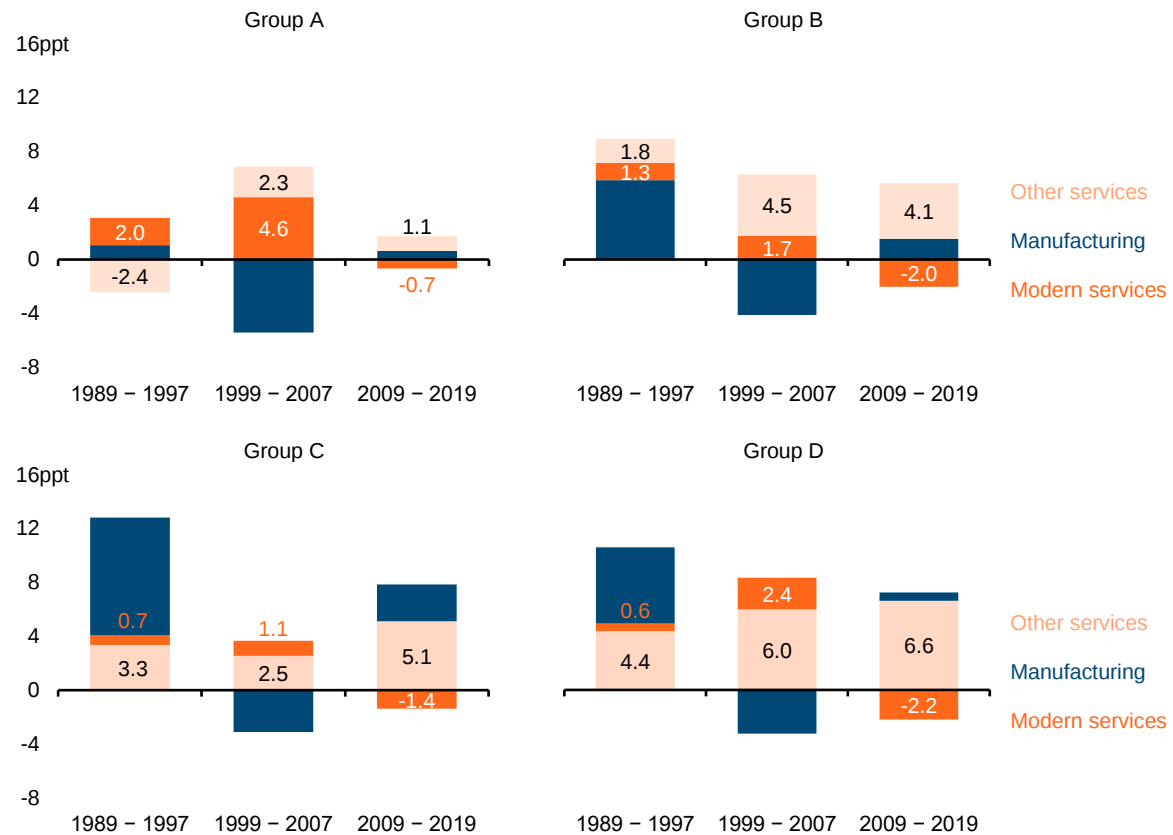
Figure 1.24: Services employment share, by subsector and state group, 2019



Source: DOS (various years.b), KRI calculations

As manufacturing employment contracted with deindustrialisation in the earlier 2000s, employment expanded in services. However, expansion of *modern services* was only in Group A (4.6 percentage points from 11.4% of total employment in 1999 to 16.0% in 2007), while other state groups saw expansion in *other services*. After the GFC, *modern services* employment share generally contracted, but the decline was the smallest in Group A (0.7 percentage points from 15.3% of total employment in 2009 to 14.6% in 2019) compared to other groups (Figure 1.25).

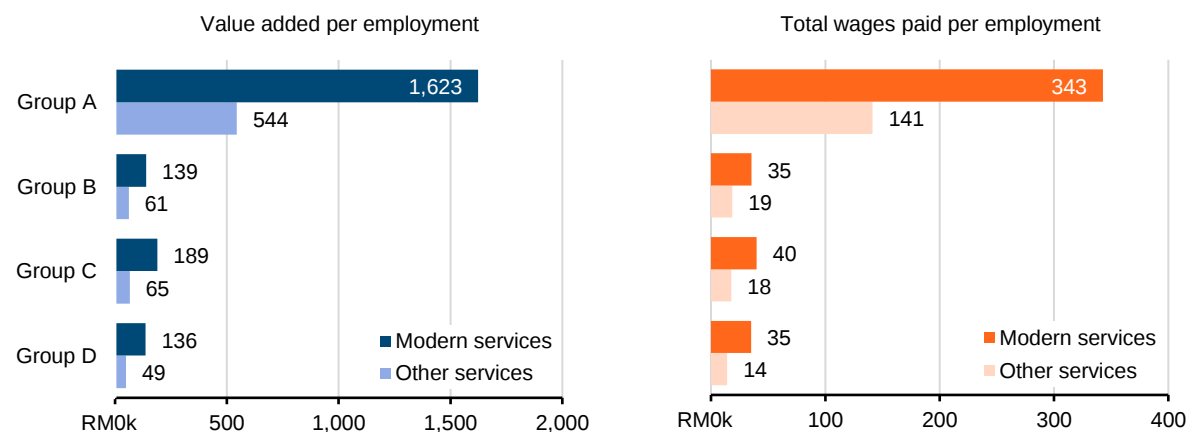
Figure 1.25: Change in employment share, by economic activity, state group and period



Source: DOS (various years.b), KRI calculations

Moreover, there were also differences in productivity and average wages between services subsectors in different state groups. In Group A, average wages and productivity, particularly in *modern services*, was much higher than other groups (Figure 1.26).

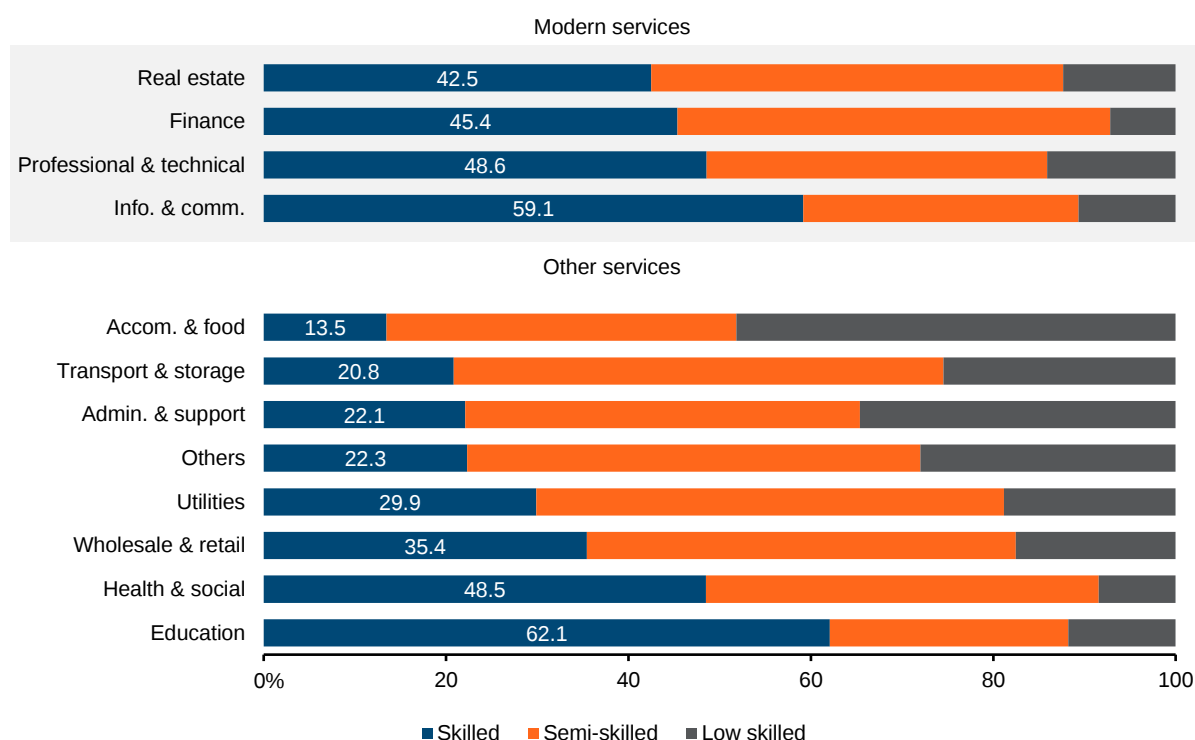
Figure 1.26: Services annual value added and total wages paid per employment, by subsector and state group, 2015



Source: DOS (2017a), KRI calculations

We categorised services into *modern services* and *other services* based on Ng, Tan, and Tan (2018) for consistent analysis. However, it should be noted that there are more variations among *other services* subsectors. For example, in *education* and *human health & social work services*, the shares of skilled employed persons and employee compensation in these subsectors were comparable to or higher than *modern services* (Figure 1.27). *Utilities* show comparable levels of productivity with some *modern services* (Figure 1.28). These subsectors are also important because they provide essential services fundamental to the long-term well-being of the people.

Figure 1.27: Services employment share, by subsector and skill level, 2017

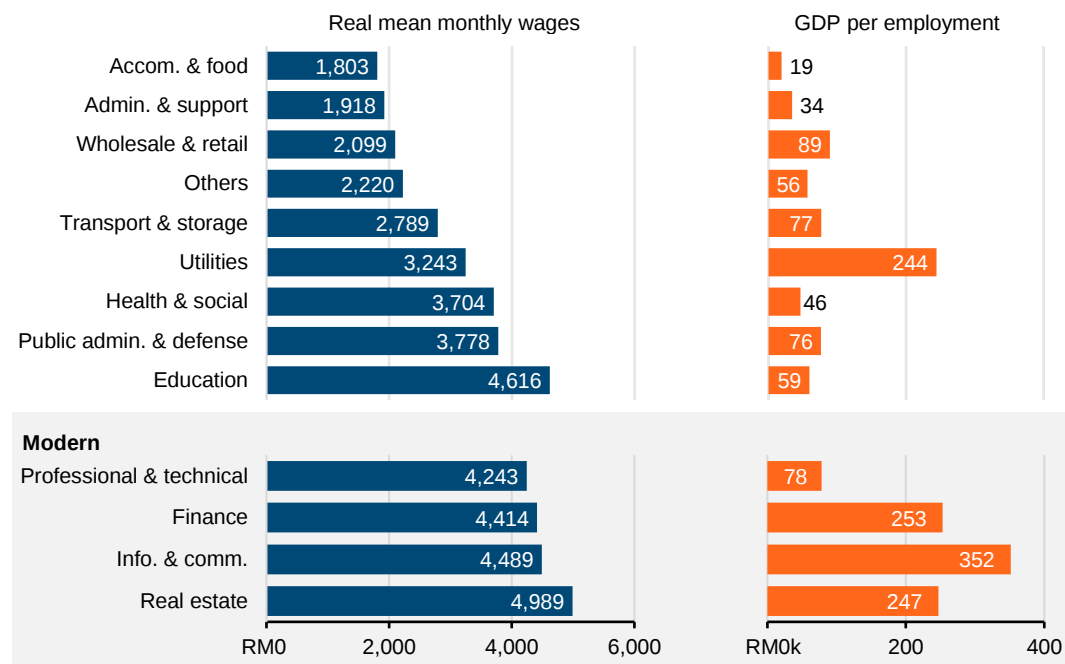


Note: This excludes employed persons in public-sector establishments.

Source: DOS (2019a), KRI calculations

However, illustrated in Figure 1.29 is the contraction of *modern services* as well as social services, and the expansion of “traditional” services such as *wholesale & retail*, *accommodation* and *food & beverages* in the past decade, between 2009 and 2019. Wages and productivity levels of “traditional” services are not only low (Figure 1.28), but they also have higher shares of informal and non-standard workers not covered by social protection.

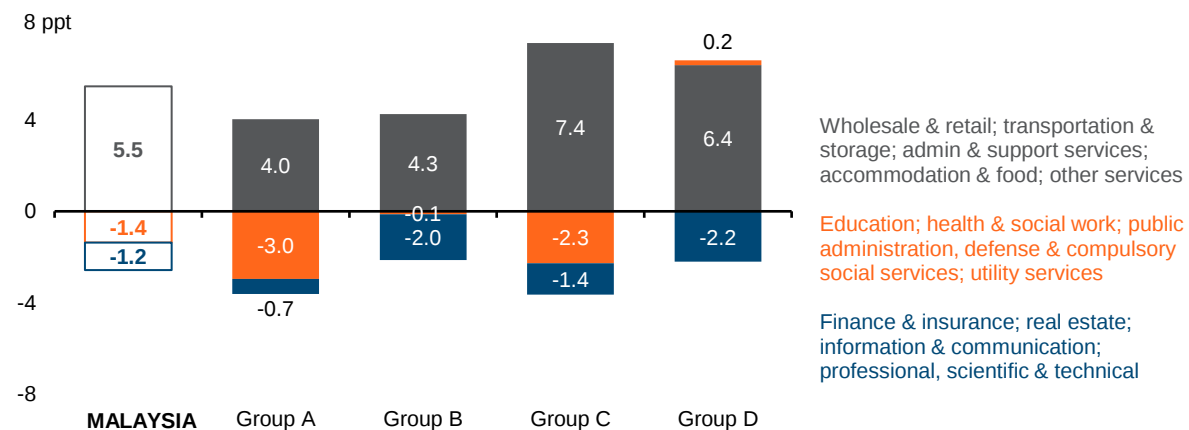
Figure 1.28: Services real mean monthly wages and GDP per employment, by subsector, 2015 – 2019 average



Note: Refers to wages of citizen employees. Data in 2019 prices.
Source: DOS (2020i), KRI calculations

Note: Data in 2019 prices.
Source: CEIC (n.d.), DOS (2020b), KRI calculations

Figure 1.29: Change in services employment share, by subsector and state group, 2009 – 2019



Source: DOS (2020b), KRI calculations

This section highlights some key observations, illustrating the importance of coordination between industrial, regional and labour market policies. During industrialisation, most states experienced the expansion of manufacturing employment, yet less advanced states shifted away from this activity at much lower employment and income levels during deindustrialisation period. Most states then shifted to be services-based, but the types of services activities vary among states. The concentration of highly-paid *modern services* in Group A and *other services* elsewhere have consequences on labour market outcomes, discussed in the next section.

SECTION

02

LABOUR MARKET OUTCOMES AND DECENT WORK

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SECTION 2

LABOUR MARKET OUTCOMES AND DECENT WORK

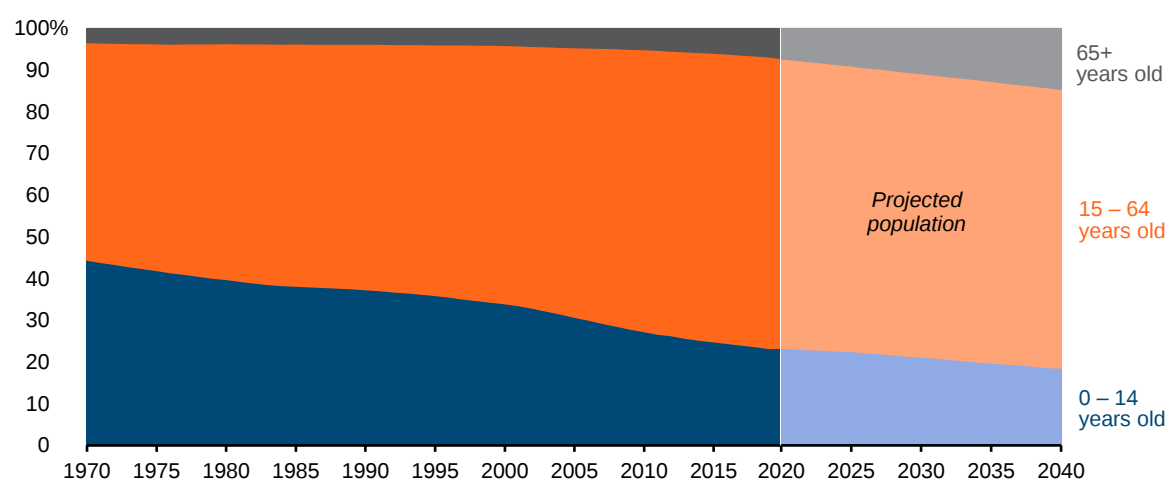
Following the earlier discussion of structural changes, this section looks at labour market outcomes to enable further understanding of the nature of disparities at different geographical locations in Malaysia. Before we analyse labour market outcomes in different parts of the country as our economic structure changed, this following sub-section analyses long-term demographic trends in different regions to provide background to and context of Malaysia's labour market.

2.1 Shrinking Working Age Population

In 2020, about 23.4 million individuals, or 69% of total population in Malaysia are part of working age population, defined as those ages 15 and 64. The share of working age population is estimated to peak by 2017 and 2020, with the country expected to reach an ageing population status by 2030, when 15% of its total population will be 60 years and older¹⁸ (Figure 2.1).

This diminishing working age population will occur against the backdrop of declining annual population growth, falling fertility rates and increasing life expectancy¹⁹. Some view these demographic trends as worrisome since the trends imply a future when there will be fewer employed persons to participate in economic activities and support its ageing population²⁰.

Figure 2.1: Population share, by age group, 1970 – 2040



Note: 2019 data onwards from DOS population projections. Include non-citizens.

Source: DOS (2020f), DOS (2016b)

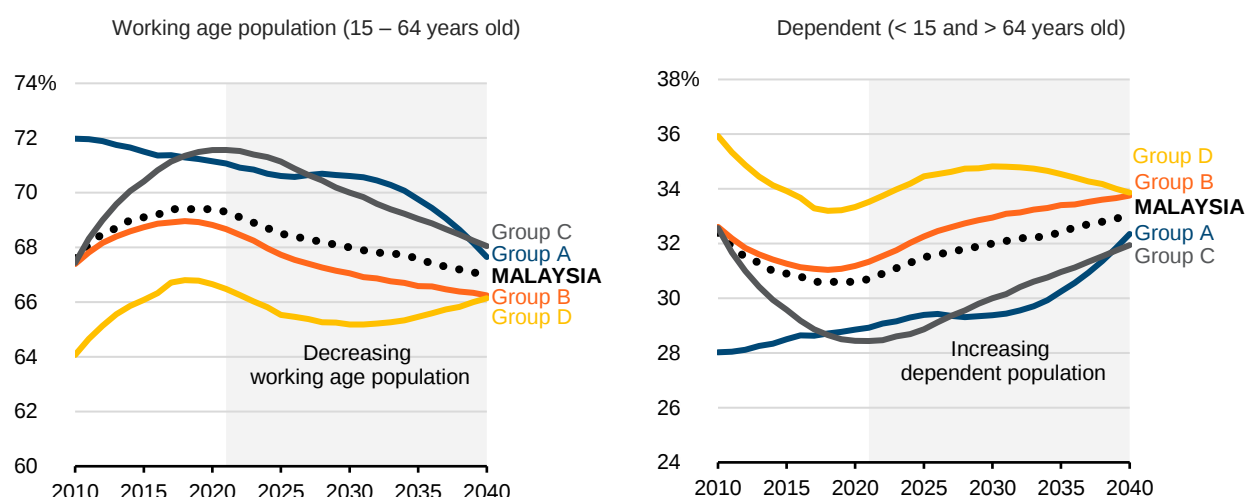
¹⁸ KRI (2015)

¹⁹ DOS (2017b)

²⁰ Bloom et al. (2015)

Figure 2.2 shows the demographic shifts with the decreasing working age population and the increasing dependent population (below 15 and above 64 years old). These situations are the case across all four groups of states, with Group A (Kuala Lumpur, Putrajaya and Selangor) experiencing the drop in working age population and rise in dependent population, particularly among the elderly ages 65 and above, much earlier in 2010. Group C (Labuan, Sabah and Sarawak) is expected to experience this much later in 2021.

Figure 2.2: Population share, by age group and state group, 2010 – 2040



Note: 2018 data onwards from DOS population projections. Include non-citizens.
 Source: DOS (2017b), DOS (2016b), KRI calculations

A few points should be noted when looking at these trends. First, the rise in the dependent population is largely driven by the elderly population (above 64 years). This is consistent with the stagnant growth of young population (below 15 years), increasing share of its elderly population, declining fertility rates and diminishing death rates. Second, the postulated population distribution gaps among states are expected to narrow. This means each state group is expected to have a much similar distribution of working and dependent populations in the future, even after considering migration among states²¹.

Declining working age populations and rising dependent populations can increase pressure on the former to support the latter, either through taxes or government spending. With smaller working age populations, regions with higher levels of labour-intensive activities like Groups C and D would face greater pressure to modernise or become more capital-intensive. On the other hand, increasing dependent populations and subsequent care needs may also dampen women's labour force participation, as women cite care work as the main reason for joining the labour force²².

²¹ Population estimates account for internal net migration or the probability of migration, see to DOS (2016b).

²² For further discussion on unpaid care work, see KRI (2019b).

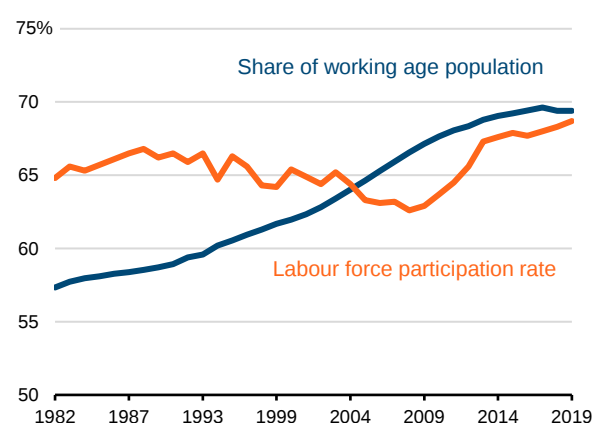
Despite these trends, a few points should be noted. One, the data presented are population projections based on past demographic trends, which may deviate in the future²³. Two, these statistics only reflect dependency burdens (i.e., the ratio of working age to dependent population) based on the age composition, and not the economic dependency since not all working age individuals are economically active. As elaborated in the next subsection, despite the shrinking working age population, there is still room to encourage greater economic participation among the working age population currently outside the labour force.

2.2 Gender Dimension in Labour Force Participation

The labour force participation rate (LFPR) captures the individuals in the working age population, either working or looking for work. In 2019, there were 15.6 million individuals actively participating in the labour force out of 22.7 million working age population, translating to 68.7% LFPR. As in Figure 2.3 and Figure 2.4, a high working age population share does not necessarily mean high labour force participation.

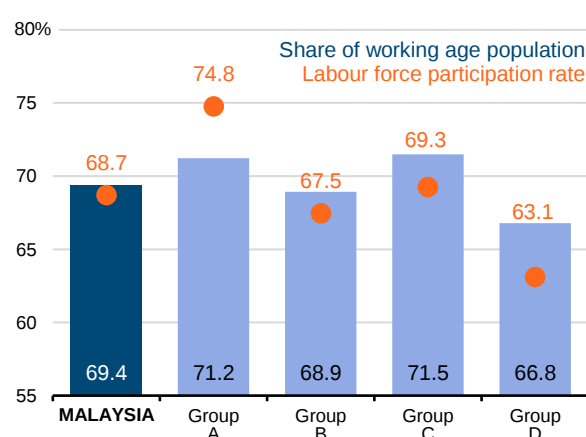
Between 1982 and 2019, these two indicators have not always moved in tandem. In fact, the working age population has continued to grow since 1982 while the LFPR saw a downward trend until 2010, after which it increased and surpassed its peaks in previous years. 2019 figures also show that while Groups A and C have a similar share of working age population, i.e., at around 70%, the LFPR for Group A is higher at 74.8% than the LFPR for Group C at 69.3%. This means, there are more economically active individuals in Group A compared to Group C.

Figure 2.3: Working age population share and LFPR, 1982 – 2019



Source: DOS (2017b), DOS (2020b), KRI calculations

Figure 2.4: Working age population share and LFPR, by state group, 2019

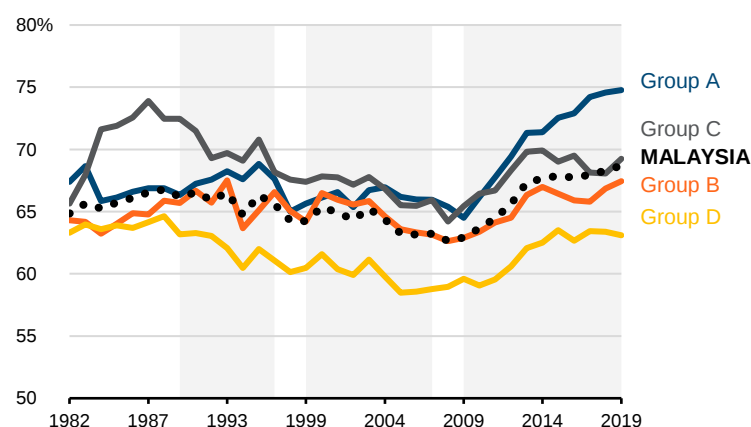


There is still room to encourage more active participation in the labour market although we may have a smaller working age population. To improve LFPR, several factors can be considered.

²³ According to DOS, “the projections are not a forecast of future population but portrays the scene of the growth and changes in the population (in terms of structure and its composition) in the future”. Source: DOS (2016b)

LFPR trends in Malaysia appear to have moved with the structural changes rather than cyclical factors (e.g. economic ups and downs), consistent with the findings in the literature²⁴. As evident in Figure 2.5 and Table 2.1, the LFPR for Groups A and B (Johor, Melaka, Negeri Sembilan, Pulau Pinang and Terengganu) increased with industrialisation (1989 – 1997, Period 1) decreased with the deindustrialisation (1999 – 2007, Period 2) and spiked when the deindustrialisation moderated and services expanded (2009 – 2019, Period 3). This differs from trends observed in Group C and Group D (Kedah, Kelantan, Pahang, Perak and Perlis) where their LFPR dropped in the first two periods before rising in the third period. This is unsurprising as manufacturing employment has been concentrated in Groups A and B. Reviving economic activities appear to lead to higher labour market participation in the labour market.

Figure 2.5: Overall LFPR, by state group, 1982 – 2019



Note: Shaded areas cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively.
Source: DOS (2020b), KRI calculations

Table 2.1: Change in LFPR, by state group and period

	1989 – 1997	1999 – 2007	2009 – 2019
MALAYSIA	-0.6	-1.0	5.8
Group A	1.3	0.3	10.3
Group B	0.9	-1.1	4.6
Group C	-4.3	-1.5	3.8
Group D	-2.1	-1.7	3.5

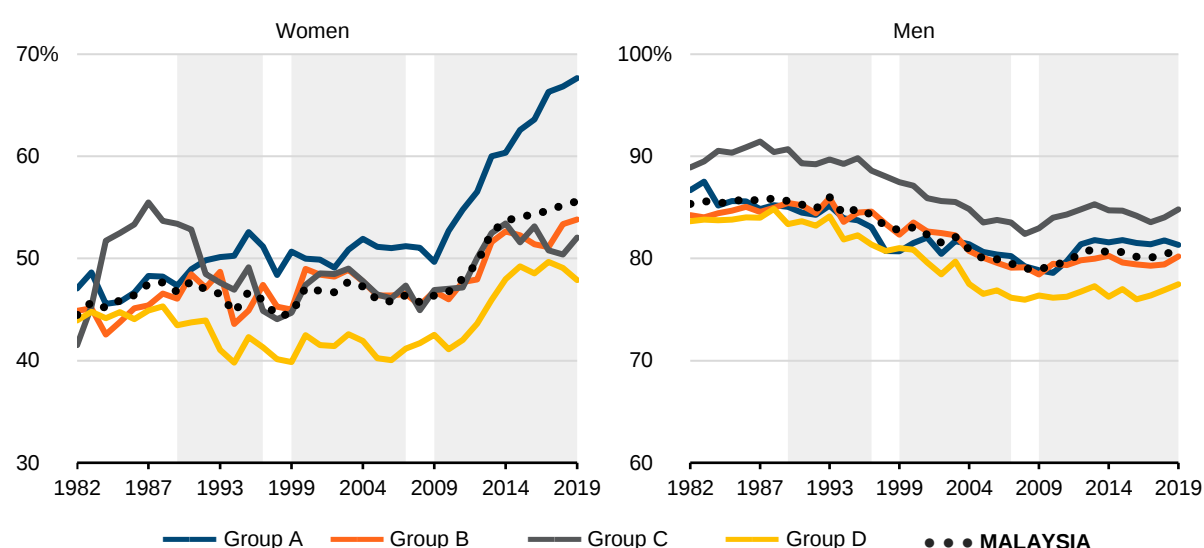
In 2019, out of 15.6 million labour force, 6.1 million were women (39%) while 9.5 million were men (61%). Malaysia's rising LFPR in recent years appears to be sustained by rising women's participation amid falling men's participation. Between 2009 and 2019, overall LFPR increased 5.8 percentage points from 62.9% in 2009 to 68.7% in 2019; while men's LFPR increased only by 1.9 percentage points from 78.9% to 80.8% and women's LFPR jumped by 9.2 percentage points from 46.4% to 55.6%.

When the gender dimension is disaggregated at the state group level, this trend persisted. The decline of men's LFPR in Group A (-5.4 percentage points from 86.7% to 81.3%) was offset by rising women's LFPR (20.6 percentage points from 47.1% to 67.7%) between 1982 and 2019, contributing to an overall LFPR increase (7.4 percentage points from 67.4% to 74.8%). As seen in Figure 2.6, women's LFPR in Group A exceeded other regions, especially in the latter period when the deindustrialisation moderated. Between 2009 and 2019, women's LFPR in Group A states expanded by 18.0 percentage points from 49.7% to 67.7%, while other states expanded 10.0 percentage points on average. These trends coincide with the expansion of services activities in the last decade.

²⁴Krause and Sawhill (2017)

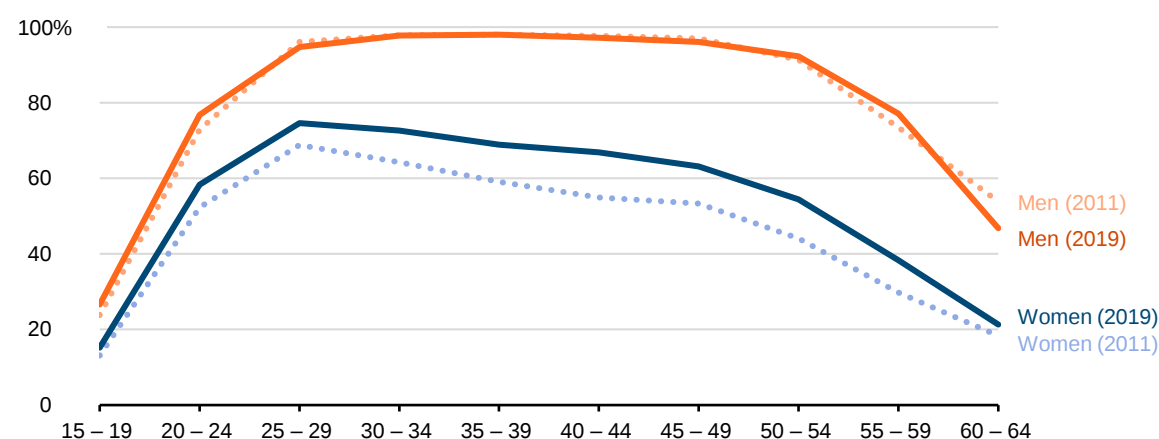
All four regions followed the national pattern of a moderate decline of men's LFPR in Periods 1 and 2 (by average of -2.4 percentage points) before it improved slightly in Period 3 (by average of +1.8 percentage points)(Figure 2.6). The reasons behind the declining men's LFPR during Period 1 are not fully understood due to limited data²⁵. However, men staying longer in school and retiring before 65 could be some of the contributing factors²⁶. Although the LFPR of younger men ages 15 to 19 increased by 2.8 percentage points from 23.8% 2011 to 26.6% in 2019, the LFPR of older men ages 60 to 64 decreased by 7.0 percentage points from 46.8% to 39.8%, supporting early retirement as a factor for declining men's LFPR. Women's participation, on the other hand, rose for all age groups (Figure 2.7).

Figure 2.6: LFPR, by gender and state group, 1982 – 2019



Note: Shaded areas cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively.
Source: DOS (2020b), KRI calculations

Figure 2.7: LFPR, by gender and age group, 2011 and 2019



Source: DOS (2010), DOS (2019d)

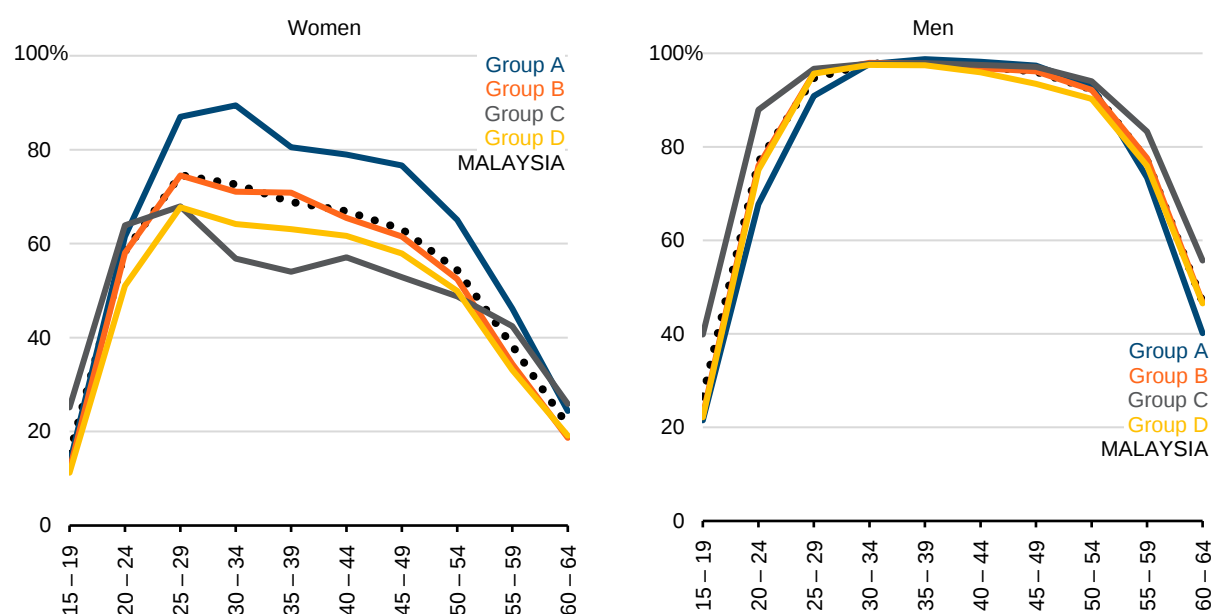
²⁵ No labour force data breakdown by age and gender prior to 2010.

²⁶ Data from the UNESCO Institute of Statistics shows gross tertiary enrolment rate for men increased from 4.9% in 1982 to 38.6% in 2017. See ILMIA (n.d.), World Bank (2019).

Falling men's and raising women's LFPR are not unique to Malaysia and can be observed in other countries, especially in advanced economies²⁷. Increased women's LFPR coincided with more educated women, declining fertility as well as growth in the economic activities dominated by women like education and health²⁸. Despite this positive development, the Malaysian LFPR gender gap is still relatively large compared to other countries²⁹ while women's LFPR of 55.6% in 2019 was slightly below the norm for our level of economic development³⁰. Only half of women in the working age cohort were active labour market participants compared to 80.8% for men in 2019, indicating that more women could still be encouraged to participate in the labour market.

However, a high LFPR is not necessarily better if it means a higher proportion of young individuals are leaving school to work rather than pursue higher education, which could provide more opportunities for upward social mobility. For instance, women's LFPR in Group A was high among prime working age women (ages 25 to 54) (Figure 2.8). By contrast, Group C has a higher younger women's LFPR in typical schooling years (ages 15 to 19). In fact, the participation rates among those aged 15 to 19 for both genders in Group C (men: 39.9%, women: 25.2%) almost doubled the corresponding rates for Group A (men: 21.5%, women: 13.1%). This disaggregation shows that states in other groups can improve their overall LFPR by improving participation among women of prime working age, while encouraging younger individuals to stay in education longer.

Figure 2.8: LFPR, by gender, age group and state group, 2019



Source: DOS (2019d), KRI calculations

²⁷ Grenville (2018)

²⁸ These factors are attributed to the rise in women's LFPR in 18 Latin American countries. See Klasen et al. (2019), World Bank (2019).

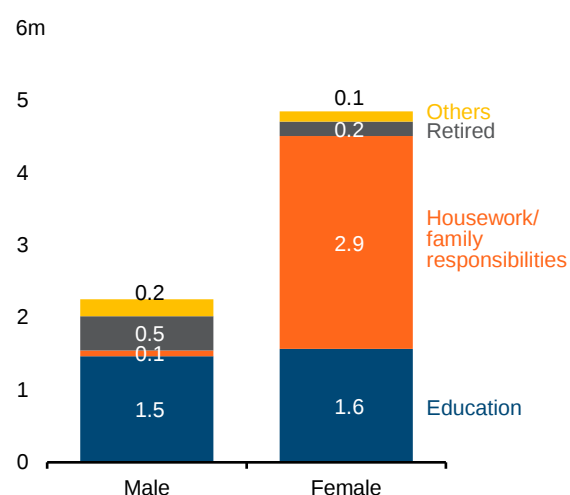
²⁹ KRI (2018c), World Bank (2019)

³⁰ World Bank (2019)

Reviewing population outside labour force statistics provides insights as to why many women and men do not participate in the labour force. Two key observations can be drawn from the breakdown of population outside the labour force³¹. One, the majority of men who did not participate in the labour force were young, ages 15 to 24 (69% or 1.5 million in 2019), which coincided with a similar proportion of men outside the labour force for education (65% or 1.5 million in 2019)(Figure 2.9 and Figure 2.10).

Two, although there were similar numbers of men and women who stayed out of the labour force for education, it was not the most common reason among women. Unlike men, the majority of women who did not participate were of prime working age and older. In 2019, these age groups made up 3.0 million women outside the labour force, which coincided with 2.9 million women citing family responsibilities as their reason for not seeking work. As most women were unable to participate because of family responsibilities, policies addressing, or redressing care work may release more women to participate in the labour force³². The burden of unpaid care work shouldered by women is further elaborated in Box 2.1.

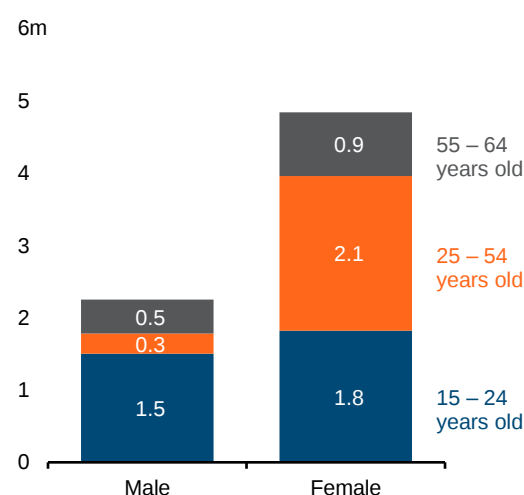
Figure 2.9: Population outside the labour force, by gender and reason for not seeking work, 2019



Note: Education includes *schooling and going for further studies*. Others include *disabled and not interested*.

Source: DOS (2019d) KRI calculations

Figure 2.10: Population outside the labour force, by gender and age group, 2019



Source: DOS (2019d), KRI calculations

³¹ KRI (2018c)

³² KRI (2019b), World Bank (2019)

Considering the unequal distribution of care work between women and men, a reduction in the standard working week has been proposed to promote women's advancement in the workplace³³. It is argued that long working hours not only reduces women's access to high-paying jobs, but also men's abilities to perform care work at home. While the 40-hour maximum work week has been legislated in 54 countries, including Japan and Indonesia, Malaysia still operates under the 48-hour work week regime³⁴. Despite declining average working hours per week, the Malaysian average of 45.1 in 2019 is still higher than the average global rate (39.1) and comparable to lower middle-income economies like Myanmar (45.7) and Mongolia (49.7)³⁵. Malaysia's legally mandated minimum paid vacation and public holidays are also comparable to Singapore; however, Malaysia's weekly working hours are actually much higher than expected given its GDP per capita level. As working hours are one of key components of *decent work*, these figures indicate room for improvement for Malaysia.

Box 2.1: Decent work and working women's "double burden"

National statistics indicate that fewer women in Malaysia work or look for work compared to men. When women do participate in the labour force, they tend to remain unemployed or to hold precarious jobs³⁶ at higher rates than men. The average woman in the labour force works fewer hours than the average man. When broken down further by occupation, this trend holds, even for occupations with more women than men.

One possible explanation is that women face a "double burden" at home and in the workplace and have to balance their time between the two responsibilities. The phenomenon, known as the "second shift", occurs when women come home after a day at work and then engage in unpaid care work at home³⁷. This forces them to make difficult decisions about how actively they can participate in the labour force.

Unpaid care work

KRI's, "Time to Care: Gender Inequality, Unpaid Care Work and Time Use Survey"³⁸ highlights the importance of care work for the nation and the disproportionate share of care work done by women. Care work is defined by the ILO as "activities and relations involved in meeting the physical, psychological and emotional needs of adults and children, old and young, frail and able-bodied"³⁹. This includes direct care work for an immediate beneficiary, e.g., feeding a child, and indirect care work that typically takes the form of domestic work, e.g., doing laundry.

³³ Hegewisch and Lacarte (2019)

³⁴ Nur Thuraya and Siti Aisyah (2020)

³⁵ The average global weekly hours are computed as a simple average of means of 61 countries. Data for Malaysia is taken from DOS (2020c); otherwise ILO (n.d.b).

³⁶ There is no universally accepted definition for "precarious job" but it is often associated with jobs without the typical full-time arrangement. Source: ILO (2012a). Based on estimates by Hawati and Nur Thuraya (2020), non-standard workers among women in Malaysia have grown faster than its counterpart in recent years.

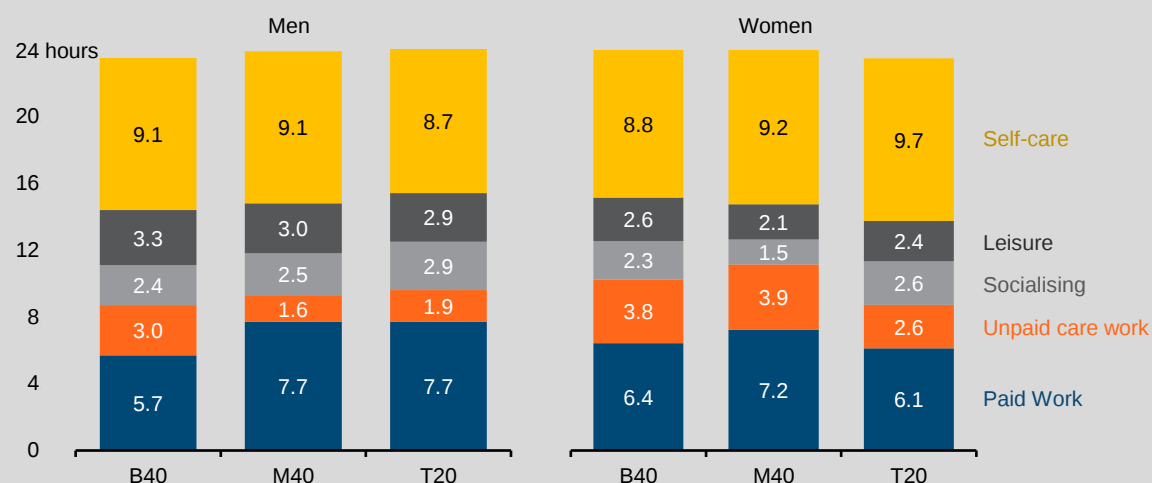
³⁷ Hochschild and Machung (2012)

³⁸ KRI (2019b)

³⁹ ILO (2018a)

Figure 2.11 shows that women of all income classes spent more time on unpaid care work than men in their respective income classes. In particular, compared to M40 men, M40 women spent 7% less time on paid work and 144% more time on unpaid care work.

Figure 2.11: Average time spent on various activities, by gender and income group, 2018



Note: Activities that took up less than 1% of total time were excluded from the chart. These were *learning* and *unpaid volunteer work activities*.

Source: KRI (2019b)

While men do participate in unpaid care work, on average, they spent 15% less time than women on direct care and 53% less time on domestic work. In other words, women spent more than twice as much time as men on tasks such as cooking, cleaning, and doing laundry.

Given the fixed and finite number of hours in a day, there is an inverse relationship between unpaid care work and working hours, which implies an inverse relationship between unpaid care work and income. As noted in KRI (2019b), “every additional hour spent on unpaid care work translates to less time for market work and thus less income, widening the gap between those who do the bulk of unpaid care work—typically women—and those who do not”.

The data indicate that the main reason women cite for not participating in the labour force is housework and family responsibilities⁴⁰. Yet, having more women in the labour force is not only positively associated with higher national production, but also with better health outcomes and higher levels of innovation⁴¹.

⁴⁰ DOS (2020c)

⁴¹ KRI (2018c)

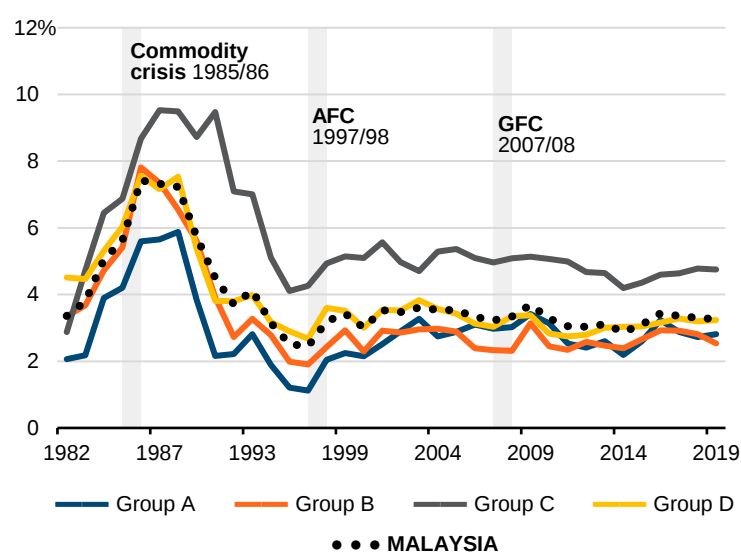
2.3 Unemployment Rate

The unemployment rate measures the unutilised labour supply and has been used to reflect general economic and labour market performance. It refers to the proportion of the active working age population (i.e., total labour force) unable to find work. Before 2020, the overall unemployment rate in Malaysia had averaged 3.9% over the last 37 years and had not increased above 4.0% between 2000 and 2019⁴².

The unemployment rate reached its peak in 1986 (7.2%) during the 1985/86 commodity crisis and was lowest in 1997 before the AFC (2.4%) (Figure 2.12). At 3.3% unemployment rate in 2019, there were half a million unemployed individuals out of the 15.0 million labour force. However, this low unemployment rate would change in 2020 with the outbreak of Covid-19, discussed in Section 3.3.

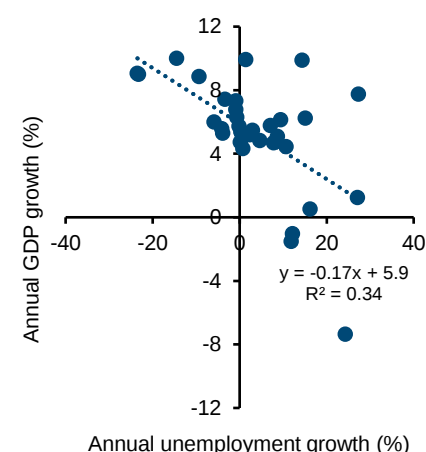
Unemployment falls as GDP rises, as shown in Figure 2.13⁴³. This is consistent with upticks in the unemployment rate during all three economic crises (Table 2.2), its rapid decline before the AFC, and little change despite deindustrialisation since 1999 (Table 2.3).

Figure 2.12: Unemployment rate, by state group, 1982 – 2019



Source: DOS (2020b), KRI calculations

Figure 2.13: Unemployment and GDP annual growth, 1982 – 2019



Source: World Bank (n.d.b), DOS (2020b), KRI calculations

⁴² The unemployment rate for May 2020 was 5.3% (the highest since 1990). The rate, however, has improved slightly in the second half of 2020 as more economic activities resume. Source: DOS (2020e)

⁴³ Zaleha, Norashidah, and Judhiana (2007)

Table 2.2: Change in unemployment rate, by state group and economic crisis

	MYS	Group			
		A	B	C	D
Commodity crisis 1985/86	1.8ppt	1.4	2.4	1.8	1.5
Asian financial crisis 1997/98	0.8	0.9	0.5	0.7	0.9
Global financial crisis 2007/08	0.1	0.1	0.0	0.1	0.3

Table 2.3: Change in unemployment rate, by state group and period

	MYS	Group			
		A	B	C	D
Industrialisation 1989 – 1997	-3.3ppt	-2.7	-3.7	-4.5	-2.7
Deindustrialisation 1999 – 2007	-0.2	0.7	-0.6	-0.2	-0.5
Moderated deindustrialisation 2009 – 2019	-0.4	-0.6	-0.6	-0.4	-0.1

Source: DOS (2020b), KRI calculations

National unemployment trends were also reflected across all state groups, with some groups having much higher rates than others. Notably, average unemployment rates between 1982 and 2019 were highest for Group C (average: 5.6%), followed by Group D (average: 3.9%), Group B (average: 3.3%) and Group A (average: 2.8%). Disaggregating unemployment rates by gender, age, strata and educational attainment identified those more susceptible to unemployment, with Groups C and D charting higher unemployment rates than others.

Table 2.4 also shows that women, those in urban area and those with post-secondary education were more likely to be unemployed. None of these categories, however, quite matches the joblessness risk experienced by youth (Figure 2.14), with youth unemployment rate six times the adult unemployment rate, and particularly worse for youth in Group D (eight times their adult counterpart).

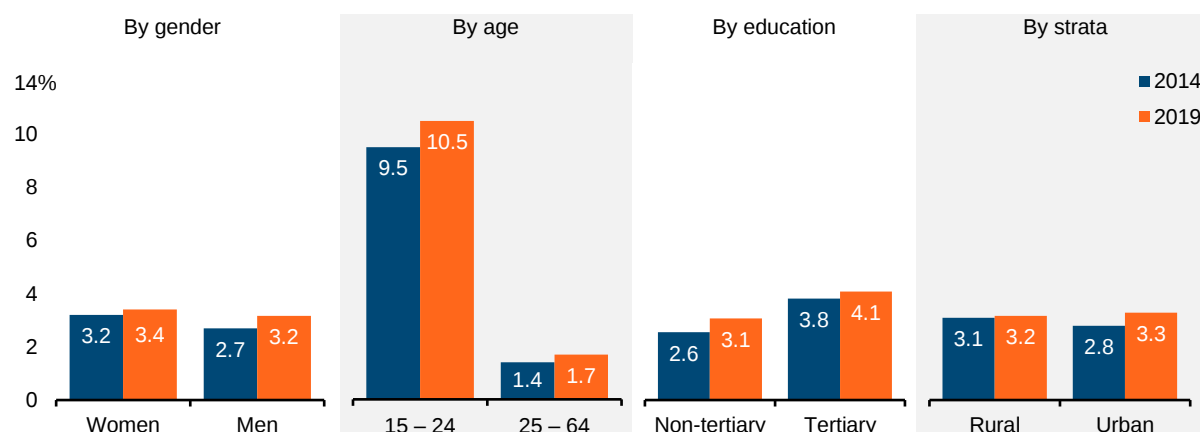
Table 2.4: Unemployment rate, by demographic characteristic and state group, 2019

	MALAYSIA	Group A	Group B	Group C	Group D
Women	3.4%	2.7	2.5	5.0	4.0
Men	3.2	2.9	2.6	4.6	2.8
Gender ratio	1.1	1.0	1.0	1.1	1.5
Rural	3.2	2.9	2.9	3.3	3.2
Urban	3.3	2.8	2.5	5.5	3.3
Strata ratio	1.0	1.0	1.2	0.6	1.0
Non-tertiary	3.0	2.8	2.3	4.2	2.6
Tertiary	3.9	2.8	3.0	7.2	5.0
Education ratio	0.8	1.0	0.8	0.6	0.5
Youth (15 – 24)	10.5	10.0	8.2	12.5	10.9
Adult (25 – 64)	1.7	1.8	1.4	2.2	1.4
Age ratio	6.3	5.7	6.0	5.7	7.9
Overall	3.3	2.8	2.5	4.7	3.2

Note: Ratios are computed by dividing the first listed sub-group over the second, e.g., women over men. When larger than 1, the unemployment rate for the first listed sub-group is higher than the second, e.g., with the gender ratio of 1.5, the women's unemployment rate is higher than the men's rate in Group D.

Source: DOS (2020c), KRI calculations

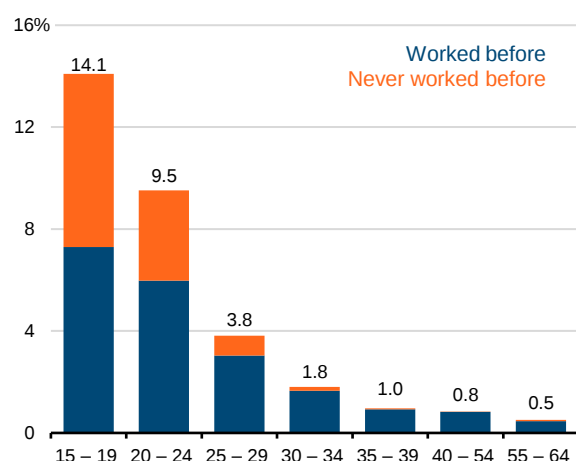
Figure 2.14: Unemployment rate, by demographic characteristic, 2014 and 2019



Source: DOS (2020b), KRI calculations

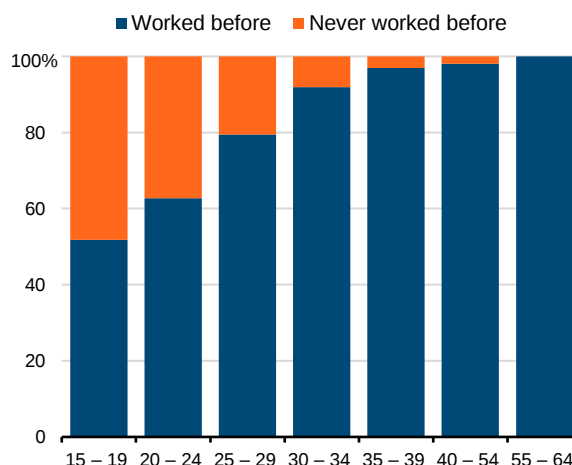
Further analysis reveals that the high youth unemployment rates were concentrated among the youngest, ages 15 to 19 (14% in 2019)(Figure 2.15 and Figure 2.16). In 2019 alone, out of 86,700 unemployed individuals aged between 15 and 19, 41,800 or almost half had never worked before. If lack of working experience prevents youths from getting hired, initiatives to provide them with working experience through apprenticeships or internships and to incentivise firms to hire first-time job seekers may enhance their chances of their employability⁴⁴.

Figure 2.15: Unemployment rate, by age group and working experience, 2019



Source: DOS (2020c), KRI calculations

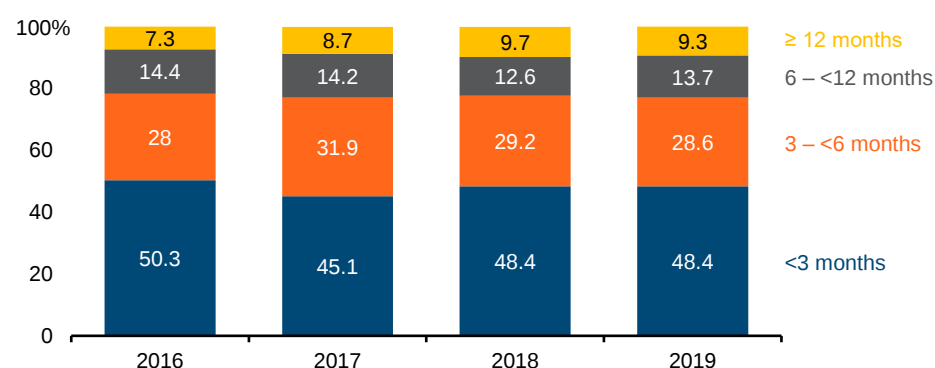
Figure 2.16: Unemployment share, by age group and working experience, 2019



⁴⁴ For instance, the European Union operates youth jobs guarantee schemes where the youth enrol for training (paid by EU funding) before being hired by participating firms. Source: EU (n.d.). Prime Minister Tan Sri Muhyiddin Yassin announced a similar upskilling programmes for tertiary local graduates in late September 2020. Citing the Smart Trucker course, the programme entitled Penjana KPT-CAP targets at least 20,000 of 2019 and 2020 graduates who will be trained and guaranteed employment upon training completion. Source: MoHE (n.d.) and The Star (2020). For other initiatives, see ILO (2011) and OECD (2013). For past Malaysian efforts to improve youth employability, see Junaidi and Mohd Amirul Rafiq (2020).

Recently published data on active unemployed persons (i.e., available and actively looking for work) showed the share of those unemployed for more than six months increased from 21.7% in 2016 to 23.0% in 2019 (Figure 2.17)⁴⁵. While this refers to long-term unemployment, most active job seekers face transitory unemployment, typically for less than three months, indicating they are switching or transitioning between jobs⁴⁶. Yet, this trend may indicate persistence of non-standard employment where individuals are employed for shorter periods of time, transitioning between different non-standard jobs⁴⁷. Improving the quality of available job market information and providing placement programmes may help tackle this problem.

Figure 2.17: Active unemployed persons share, by unemployment duration, 2016 – 2019



Source: DOS (various years.b)

Overall unemployment rate in Malaysia has been small and stable in the recent decades. While Malaysia's low unemployment and time-related underemployment rates indicate there is enough available work, work opportunities alone do not guarantee quality or *decent work*. Echoing messages of the ILO, the quality of work needs to be emphasised besides the quantity of work to ensure the economic well-being of both individuals and society⁴⁸.

For Malaysia, the declining rates of unemployment and underemployment coincides with the rising rate of self-employment (own account workers). Self-employment can be a decent work if it entails decent income, positive future earnings prospects, safe working conditions and social protection. However, available evidence suggests that the self-employed face higher *decent work deficits* as they have lower savings and lack social protection, compared to typical employees⁴⁹.

This underscores the importance of policies that aims to generate *decent work*, not just any work. For states with higher unemployment rates like those in Group C, creating jobs must also ensure *decent work*, as empirical evidence shows that developing countries with the most investment in quality jobs grew faster than their peers, and sustained economic development is not possible without more and better jobs⁵⁰.

⁴⁵ DOS unemployment figures include both active and inactive unemployed persons (available but not actively looking for work). Source: DOS (2020c)

⁴⁶ ILO (2012b)

⁴⁷ ILO (2020b)

⁴⁸ For discussion on Malaysia, see Nur Thuraya and Siti Aisyah (2020).

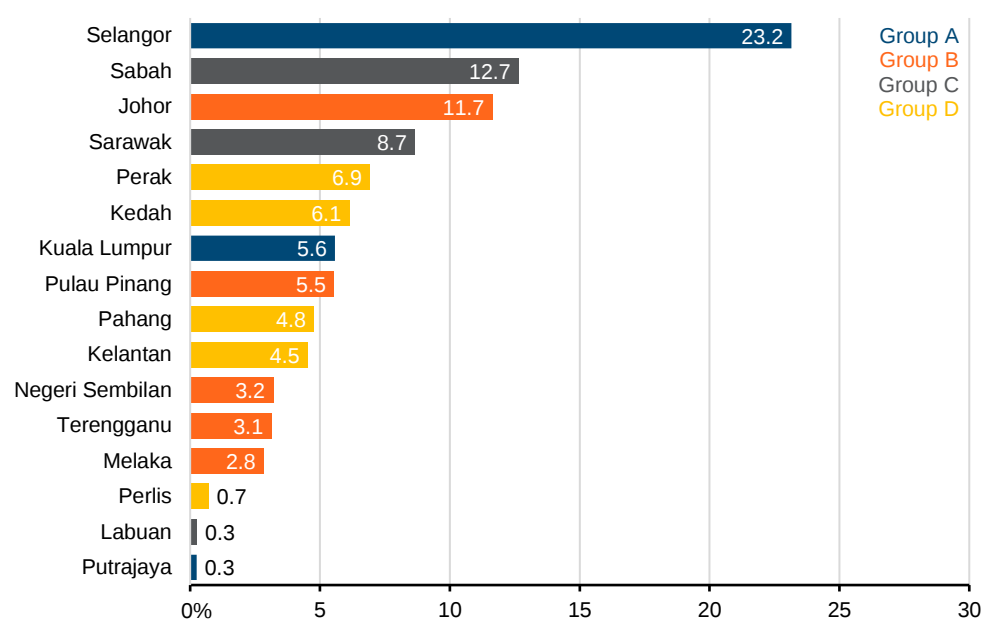
⁴⁹ See DOS (2020h).

⁵⁰ ILO (2014)

2.4 Distribution of Skilled and Educated Workforce

Against this backdrop of structural economic and demographic changes, we examine labour market outcomes at spatial (state) level. As illustrated in Figure 2.18, in 2019, Selangor has the most employed persons (3.5 million or 23.2% out of total employed persons), followed by Sabah (1.9 million, 12.7%) and Johor (1.8 million, 11.7%). Yet, the sociodemographic of the employed persons differ across states.

Figure 2.18: Employment share, by state, 2019

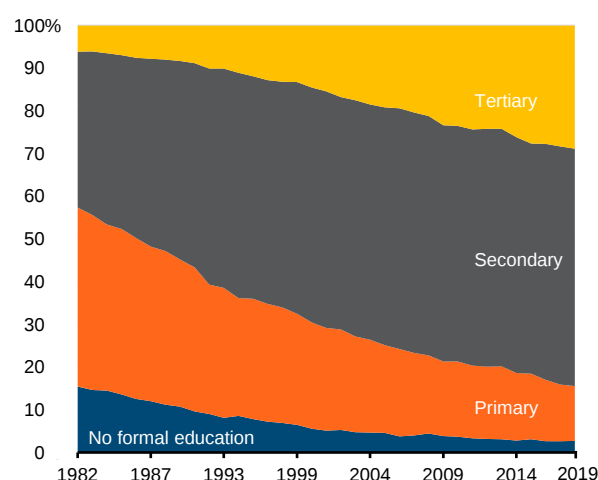


Source: DOS (2020c), KRI calculations

Most employed persons in Malaysia have secondary education. In 2019, 56% of employed persons had completed secondary education, with 29% had completed tertiary education (Figure 2.19). The rising share of tertiary-educated employed persons has been the likely consequence of two important developments, namely, more school enrolment and learning institutions over time, and the changing structure of the economy requiring educated employed persons.

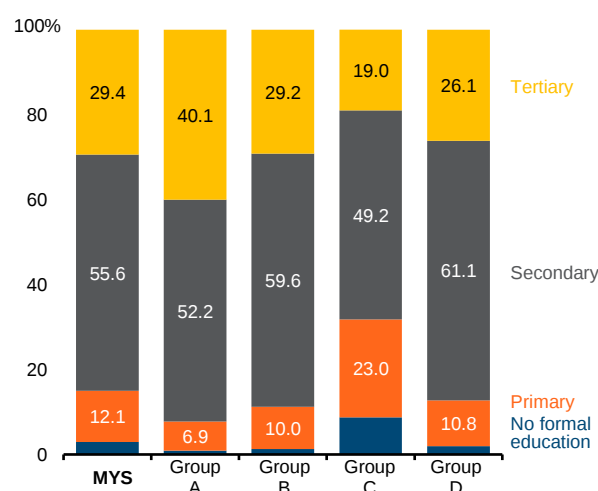
However, the distribution of employed persons by educational attainment is not similar across different state groups. In Group A, where *modern services* are more prevalent, tertiary-educated employed persons made up close to 40% of the workforce in 2019; the shares were lower in Groups C (19.0%) and D (26.1%)(Figure 2.20), where agricultural employment was larger; ranging between 23.6% in Group C and 13.6% in Group D. As illustrated in Figure 2.21 and Figure 2.22, state groups with lower share of agricultural workers or a higher share of skilled employed persons tend to have higher shares of tertiary-educated employed persons, such as Groups A and B at 40.1% and 29.2% of 2019 total employment respectively. This suggests that employed persons' educational levels correspond to the types of job opportunities available.

Figure 2.19: Employment share, by educational attainment, 1982 – 2019



Source: DOS (2020b), KRI calculations

Figure 2.20: Employment share, by educational attainment and state group, 2019



Source: DOS (2020c), KRI calculations

Figure 2.21: Agriculture versus tertiary-educated employment share, by state, 1982 – 2019

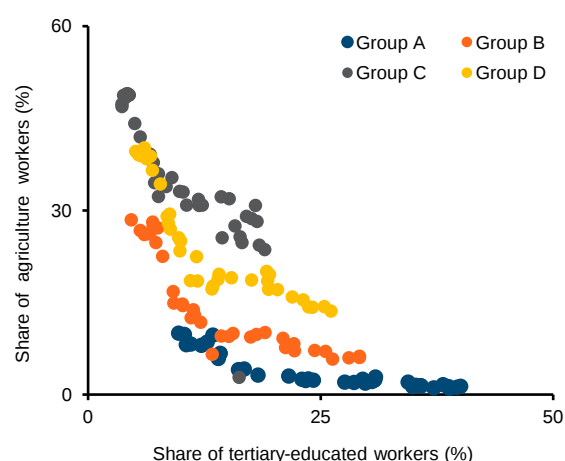
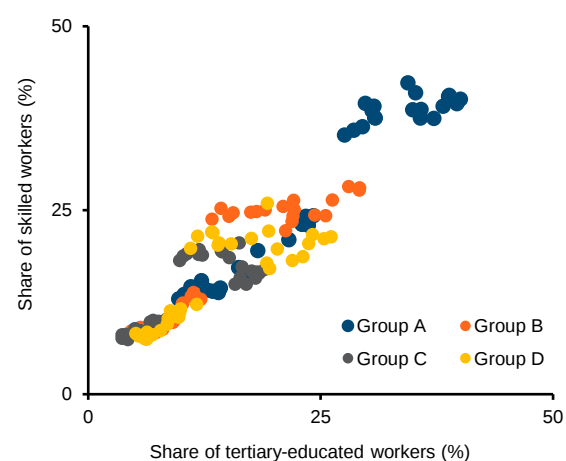


Figure 2.22: Skilled versus tertiary-educated employment share, by state, 1982 – 2019



Note: Classification of skilled employed persons follows DOS (various years.b), which is based on Malaysia Standard Classification of Occupation (MASCO) 2013. *Skilled employed persons*: 1. Managers; 2. Professionals; 3. Technicians and associate professionals; *Semi-skilled employed persons*: 4. Clerical support employed persons; 5. Service and sales workers; 6. Skilled agricultural, forestry, livestock and fishery workers; 7. Craft and related trade workers; 8. Plant and machine operators and assemblers; *Low skilled employed persons*: 9. Elementary occupations.

Source: DOS (2020b), KRI calculations

A gap between skilled and tertiary-educated employed persons is a proxy for skill mismatches or overqualification, where employed persons occupy jobs requiring lower qualifications. This gap is not only more prominent in groups with less educated employed persons but has further widened in recent years. For example, the share of skilled employed persons in Group D used to be 22.2% or 2.8 percentage points higher than the share of tertiary-educated at 19.4% in 2009 (Figure 2.23). By 2019, the difference has switched with the share of tertiary-educated employed persons stood higher at 26.1% by 4.7 percentage points than skilled employed persons at 21.4%. The gap was largest in Putrajaya, followed by Terengganu and Kelantan (Table 2.5).

SECTION 2

LABOUR MARKET OUTCOMES AND DECENT WORK

Figure 2.23: Difference between skilled and tertiary-educated employment share, by state group, 2009 and 2019

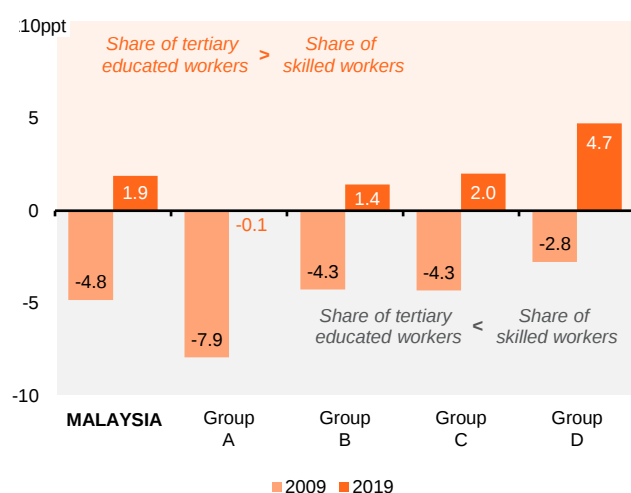


Table 2.5: Difference between skilled and tertiary-educated employment share, by state, 2019

State/Group	ppt	State/Group	ppt
Group A	-0.1	Group C	2.0
Selangor	0.0	Sabah	2.1
KL	-0.9	Sarawak	1.8
Putrajaya	12.1	Labuan	2.0
Group B	1.4	Group D	4.7
Johor	-0.9	Kedah	3.6
Melaka	1.8	Kelantan	9.3
N. Sembilan	1.6	Pahang	4.9
P. Pinang	0.7	Perak	2.4
Terengganu	10.9	Perlis	6.8
MALAYSIA	1.9		

Source: DOS (2020b), KRI calculations

The growth of skilled employed persons has flattened since 2002, while the growth of tertiary-educated employed persons continues to increase leading to the problem of overqualification. Tan, Nazihah, and Jarud (2020) also found that skilled employed Malaysians only grew by 0.8 million between 2010 and 2019, while tertiary-educated employed persons increased by 1.8 million within the same period. While length of education does not necessarily translate into quality⁵¹, this trend of increasing overqualified workforce suggests that some regions had not generated enough skilled jobs for the increasingly educated workforce. Skilled jobs are less likely to face *decent work deficits*, as they command higher salaries, offer standard employment contracts and career development opportunities, and are typically covered by the law⁵².

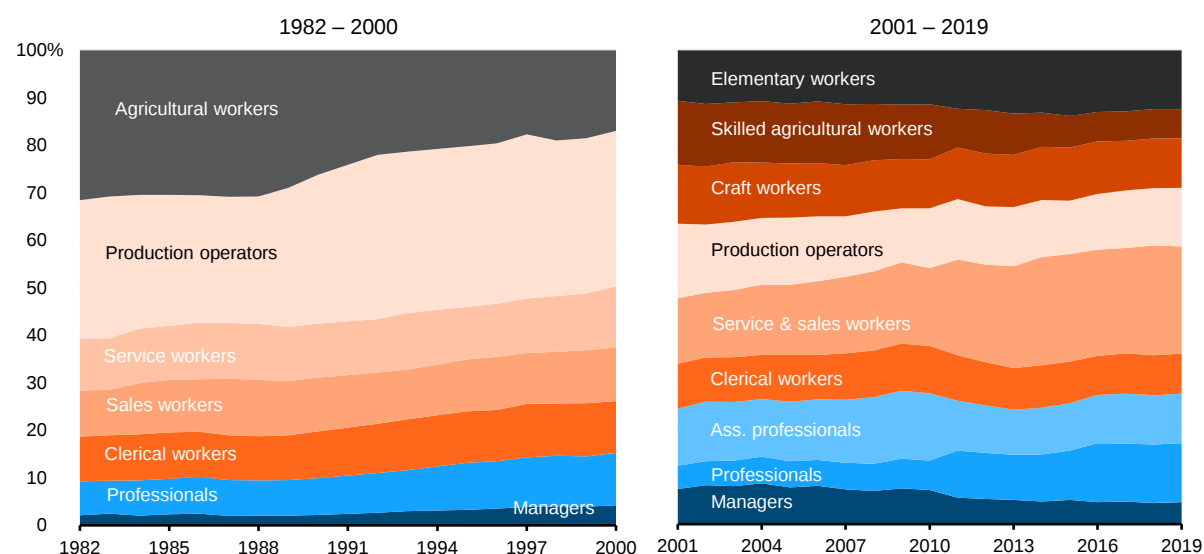
2.5 Variations in Job Created and Occupational Distribution

Prior to 2004, *plant and machine operators* had the biggest share of the total employment. Consistent with the deindustrialisation, from 2004 onwards, *sales & services* workers become the most common occupation and reached 22.6% of total employment in 2019. After *sales & services workers*, the second most common occupation was *professionals* (12.5%), followed by *production operators* (12.5%) in 2019, which used to be the most common in 2000 (Figure 2.24).

⁵¹The World Bank estimated that Malaysia experienced a learning gap or loss of 3.1 years in 2018, when adjusting 12.2 years of schooling (primary to secondary) for quality of learning. Source: World Bank (2018)

⁵²Nur Thuraya and Siti Aiysyah (2020)

Figure 2.24: Employment share, by occupation, 1982 – 2019

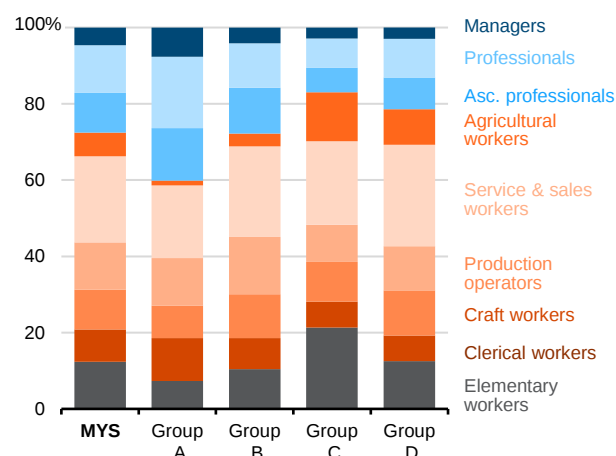


Note: Different occupational categories are used for different years. From 1982 to 2000, occupation is classified per Dictionary of Occupation Classification, 1980; from 2001 to 2010 using the Malaysia Standard Classification of Occupations (MASCO) 1998; from 2011 to 2015 using the MASCO 2008; and from 2016 to 2019 using the MASCO 2013. Source: DOS (2020b)
Source: DOS (2020b), KRI calculations

When occupations are grouped into three broad skill categories, semi-skilled occupations (shades of orange) continue to be the majority of the workforce over the years (Figure 2.24), consistent with the education profile of our workforce, i.e., most employed persons only have secondary education (Figure 2.19). However, skilled employed persons (shades of blue) are more prevalent in Groups A and B, while low skilled employed persons (grey) are more prominent in Groups C and D (Figure 2.25). Nevertheless, there is trend towards job polarisation, where skilled and low skilled employed persons are increasing most rapidly. As shown in Figure 2.26, between 2001 and 2019, skilled and low skilled jobs increased by 3.2 percentage points (from 24.3% of total employment to 27.5%) and 1.7 percentage points (from 10.6% to 12.4%), respectively, while semi-skilled jobs decreased by 4.9 percentage points (from 65.0% to 60.1%). This job polarisation is contributed by the expansion of skilled jobs in more economically advanced states in Groups A and B and low skilled jobs in less advanced states in Groups C and D.

When broken down by occupation, the biggest contributors to the decline in semi-skilled jobs were *skilled agricultural employed persons*, followed by *plant and machine operators* (Figure 2.27). This is consistent with the decline in agricultural and manufacturing employment. In the skilled category, there has been an increase in the share of *professionals* throughout. However, for Group C and Group D, the decline in *associate professionals* and *managers* offset the increase in *professionals*. Since *elementary occupations* include cleaners and (agriculture-based) labourers, *skilled agricultural workers* in the East Malaysia were most probably replaced by low skilled labourers. This is consistent with the hike of low skilled jobs and the drop in semi-skilled jobs in Group C.

Figure 2.25: Employment share, by occupation and state group, 2019



Note: Skill classification follows DOS (various years.b).
Source: DOS (2020b), KRI calculations

Figure 2.26: Change in employment share, by skill level and state group, 2001 – 2019

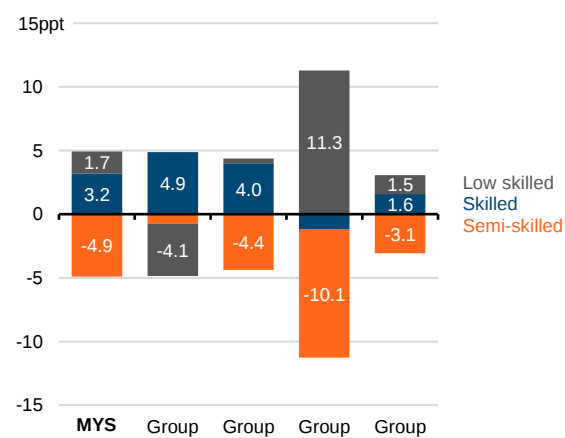
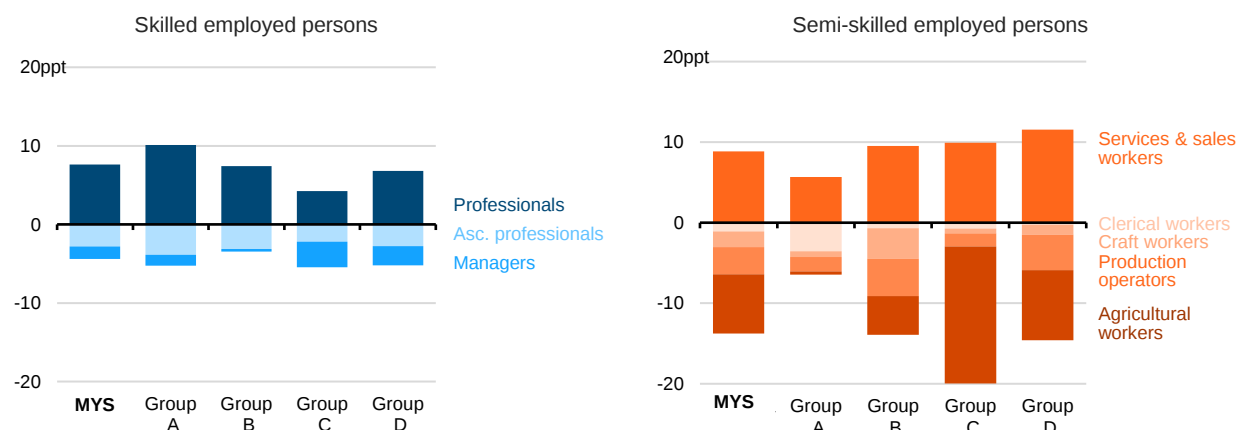


Figure 2.27: Change in skilled employment share, by skill level and state group, 2001 – 2019



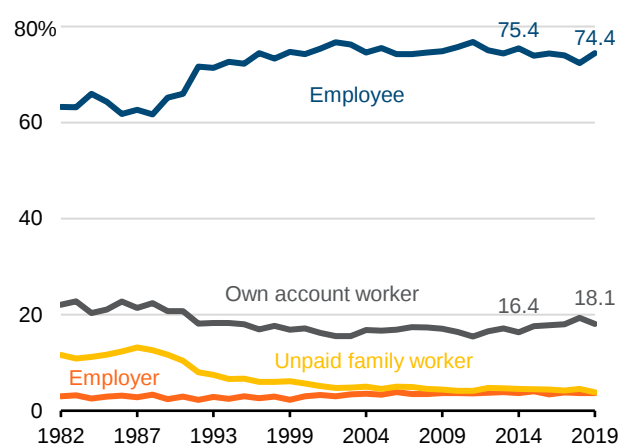
Note: Skill classification follows DOS (various years.b).
Source: DOS (2020b), KRI calculations

This changing job pattern further illustrates growing and diverging *decent work deficits* between the different state groups. The more developed states in Groups A and B have seen the biggest increase in skilled jobs (Figure 2.26), which are more likely to meet *decent work* criteria, e.g., providing decent working conditions, social protection, equal opportunity and freedom of association for workers. Groups C and D saw the largest increase among *services & sales workers*, which although it has provided jobs for many, it is also increasingly becoming non-standard, offering lower wages as well as less job security, social protection and opportunities for advancement. Moreover, there has been a clear increase in low skilled jobs especially in Group C (Figure 2.26), and these jobs are more likely to hire foreign workers.

2.6 Changes in the Nature of Employment

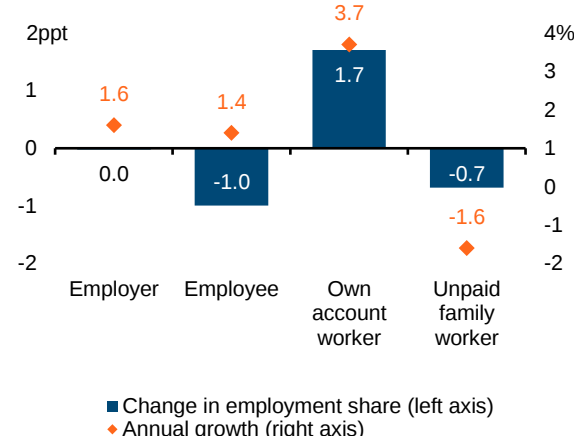
There are four employment statuses reported by official statistics: *employer*, *employee*, *own account workers* and *unpaid family workers*. In 2019, most employed individuals were *employees* or those who work for others for pay (74.4% of total employment). This was followed by *own account workers* or self-employed (18.1%), *unpaid family workers* or those working in a family business without pay (3.8%), and *employers* who operate businesses with at least one worker (3.7%). Over the past three decades, the *employee* share has generally risen with other forms of employments declining (Figure 2.28). Yet, in the past five years, there has been a declining share of *employees* (1.0 percentage points from 75.4% of total employment to 74.4%, despite still growing at 1.4% annually) and a rise in *own account workers* (1.7 percentage points from 16.4% to 18.1%, growing at 3.7% annually), with the latter growing faster than other types of employment (Figure 2.29).

Figure 2.28: Employment share, by status in employment, 1982 – 2019



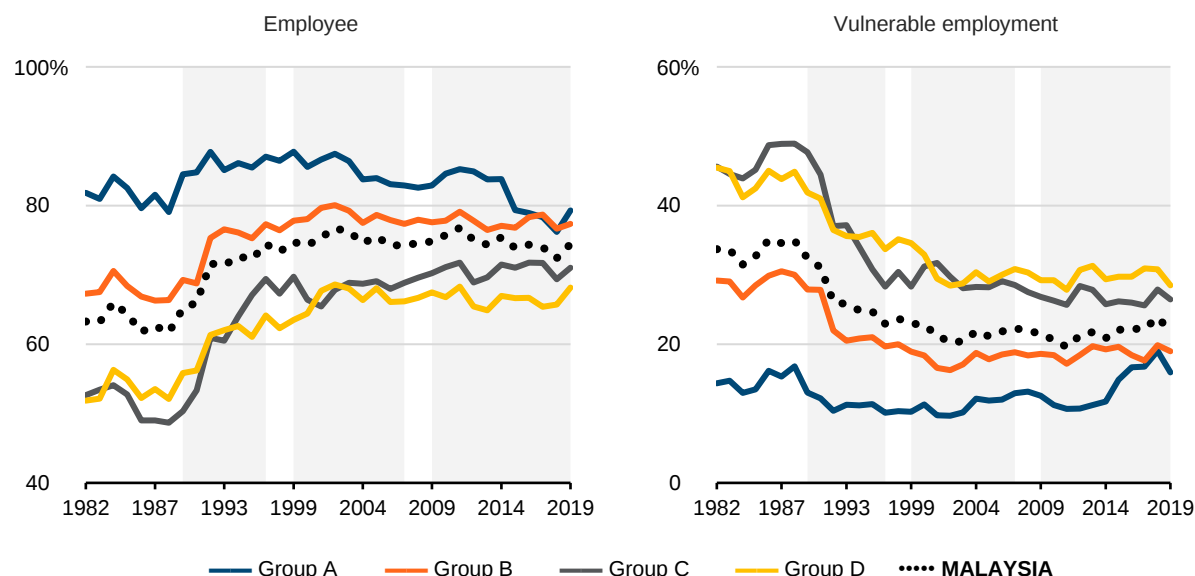
Source: DOS (2020b), KRI calculations

Figure 2.29: Change in employment share and employment annual growth, by status in employment, 2014 – 2019



Disaggregating each employment trend by state group and period reveals a number of prominent findings. One, the trend for wage employment (i.e. *employees*) rose most during the industrialisation until the AFC before declining slightly (Figure 2.30). Two, *own account* and *unpaid family workers* continue to be more prevalent in Groups C and Group D. These two worker categories are regarded as vulnerable, as they are less likely to have formal working arrangements with *decent work* elements including social and legal protection. Driven by rising *own account workers*, vulnerable employment has risen in recent years across all groups, most notably in Group A (Figure 2.30). Three, on a more positive note, the prevalence of *employees* and *vulnerable employment* is similar across state groups in 2019, as compared to 1982, indicating an improvement in regional disparities of labour market outcomes (Figure 2.30).

Figure 2.30: Employment share, by status in employment and state group, 1982 – 2019



Note: Vulnerable employment includes *own account workers* and *unpaid family workers*, based on ILO (2018b). Data unavailable for 1991 and 1994. Shaded areas cover Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2019) respectively. Source: DOS (2020b), KRI calculations

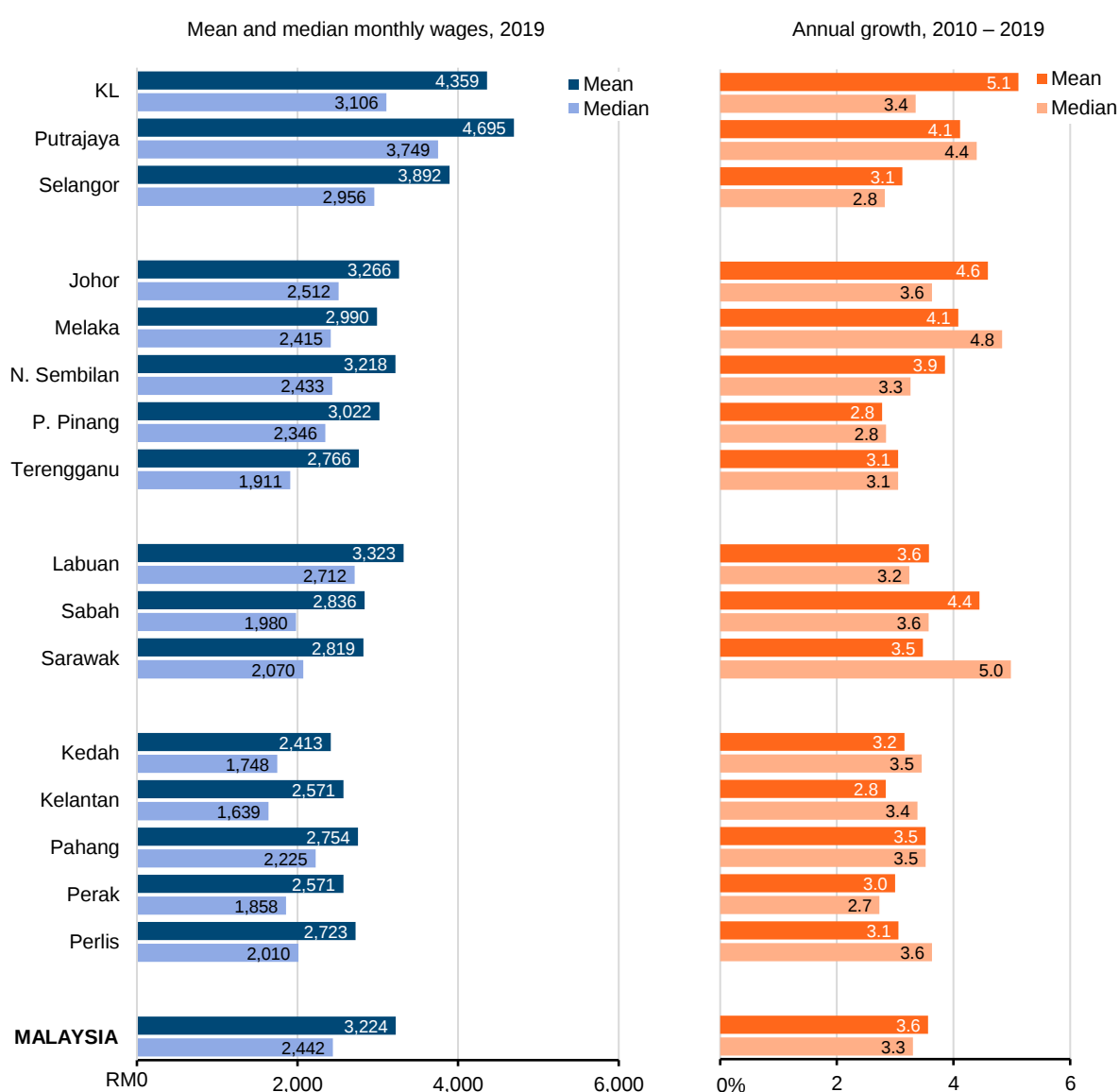
Groups A and B states have higher shares of *employees* who are more likely to have better job security and working conditions. Conversely, *own account workers* and *unpaid family workers* tend to work in vulnerable situations and face *decent work deficits* such as not covered by employment laws and formal social security schemes. They are more prevalent in Groups C and D states. However, in the past five years, there has been a rise in the shares of vulnerable employment in Group A, driven by the rise of *own account worker* or self-employment, warranting some attention.

2.7 Workers' Pay and Household incomes

Wages is a key labour market indicator to signify the compensation received by workers for their labour. In 2019, the mean monthly wages was RM3,224 while the median monthly wages was RM2,442 (Figure 2.31). States in Group A not only have higher household income, their employees were also better remunerated than other groups. Median monthly wages in Group A were about 21 – 54% higher than reported national figures. Monthly wages for most Group B states, were closer to national figures. In other groups, except Labuan, monthly wages were either close to national median or lower by up to 33%. Mean monthly wages were also consistently higher than median monthly wages, indicating that some high-salaried employees were pulling the mean upwards.

Between 2010 and 2019, real monthly wages have grown (Figure 2.31). At the national level, the real median monthly wages rose by 3.3% per year from RM1,823 to RM2,442, while the real mean monthly wages rose by 3.6% per year from RM2,352 to RM3,224. While the median monthly wages grew at 3.4% per year from RM2,309 to RM3,106 in Kuala Lumpur, mean monthly wages grew much faster by 5.1% from RM2,782 to RM4,359, indicating that the top-paid employees' wages growth was faster than the median employee in Kuala Lumpur. Meanwhile, Sarawak's median monthly wages growth was 5.0% per year from RM1,337 to RM2,070, while mean monthly wages growth was only 3.5% per year from RM2,073 to RM2,819. That said, most states experienced similar growth of median and mean wages.

Figure 2.31: Mean and median monthly wages and annual growth, by state, 2019

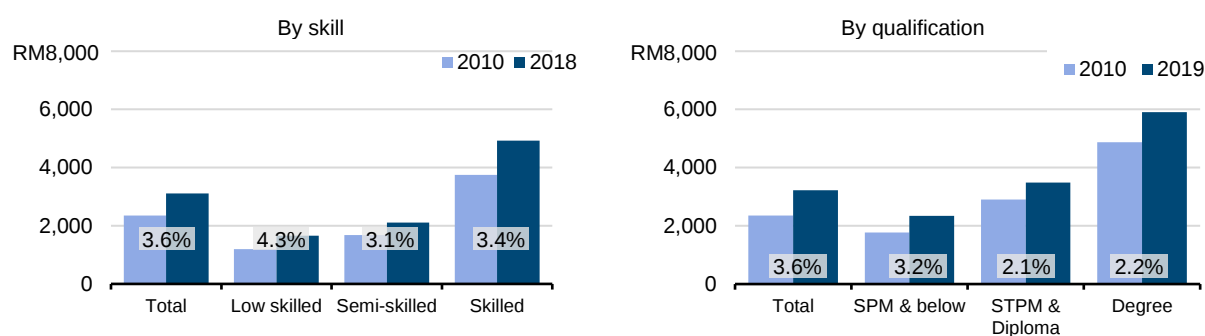


Note: Refers to citizen wages only. Data in 2019 prices.

Source: DOS (2020i), KRI calculations

What could explain the different trends in wages? Compensation varies across geography as well as across occupations, by education background and economic sector. Generally, skilled and educated workers are paid much more than other workers. In 2019, the mean monthly wages for skilled workers was RM5,073 or 57.3% above the reported national mean monthly wages of RM3,224, while the mean monthly wages for degree-holders was RM5,903 or 83.1% higher than reported national figure (Figure 2.32). Over time, low skilled workers had the largest wages growth of 4.3% between 2010 and 2019, although in levels, low skilled wages rose by RM552 only, compared to increment of skilled wages of RM1,327 (growth 3.4% per year). In the middle, the real mean monthly wages for semi-skilled employees increased by only RM524 and expanded the slowest by 3.1% per year during the same period. Figure 2.32 also shows wages for workers who completed Form 5 (11 years of schooling), the most common qualification in the workforce, grew at a similar rate to semi-skilled employees (3.2% per year), with increment of about RM579.

Figure 2.32: Real mean monthly wages and annual growth, by skill level and qualification, 2010 and 2019

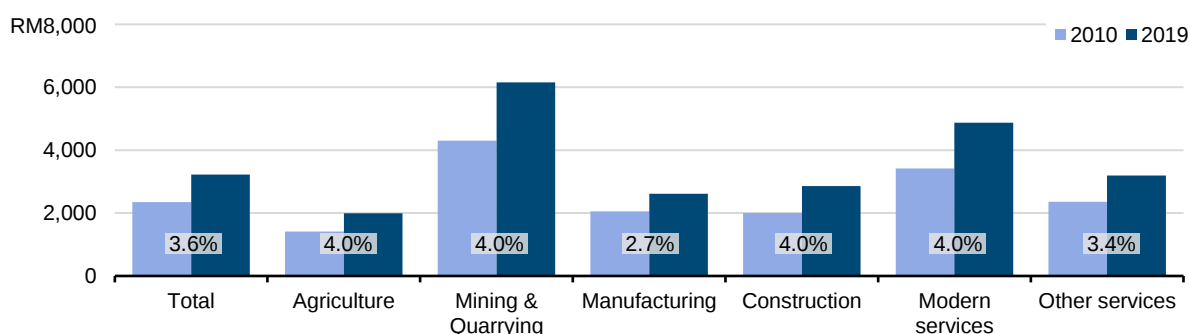


Note: Refers to citizen wages only. Data in 2019 prices. Chart on the right excludes *Others* qualification. Grey boxes show annual growth.

Source: DOS (2020i), KRI calculations

Given these wage differentials and the previous findings of various sectors employing different types of workers, it is also expected that wages differ by economic activities. Figure 2.33 shows that workers in *mining and quarrying* have the highest compensation, with real average pay of more than RM6,000 in 2019, followed by workers in *modern services* with average pay close to RM5,000. Both sectors also had the highest wage growth between 2010 and 2019, by 4.0% per year.

Figure 2.33: Real mean monthly wages and annual growth, by economic activity, 2010 and 2019

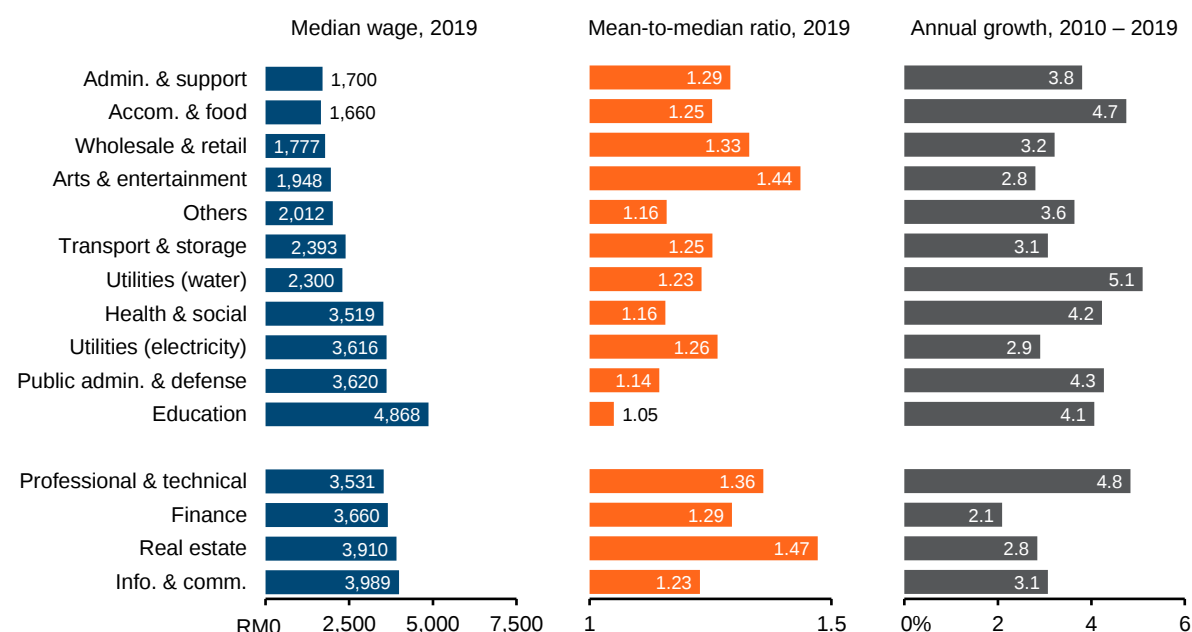


Source: Refer to citizen wages only. Data in 2019 prices. Grey boxes show annual growth.

Source: DOS (2020i), KRI calculations

As discussed in Section 1.2.3., the services sector comprises heterogenous economic activities. In 2019, the real median monthly wages was highest for employees in the *education* sector (Figure 2.34). This sector also had the most equal wage distribution, as the ratio of mean to median monthly wages was close to unity. Wages growths were also different between the subsectors, with the fastest being in *utilities (water)*, followed by *professional & technical*, growing at an annual rate of 5.1% and 4.8% respectively between 2010 and 2019.

Figure 2.34: Median monthly wages, mean-to-median wages ratio and annual growth, by subsector



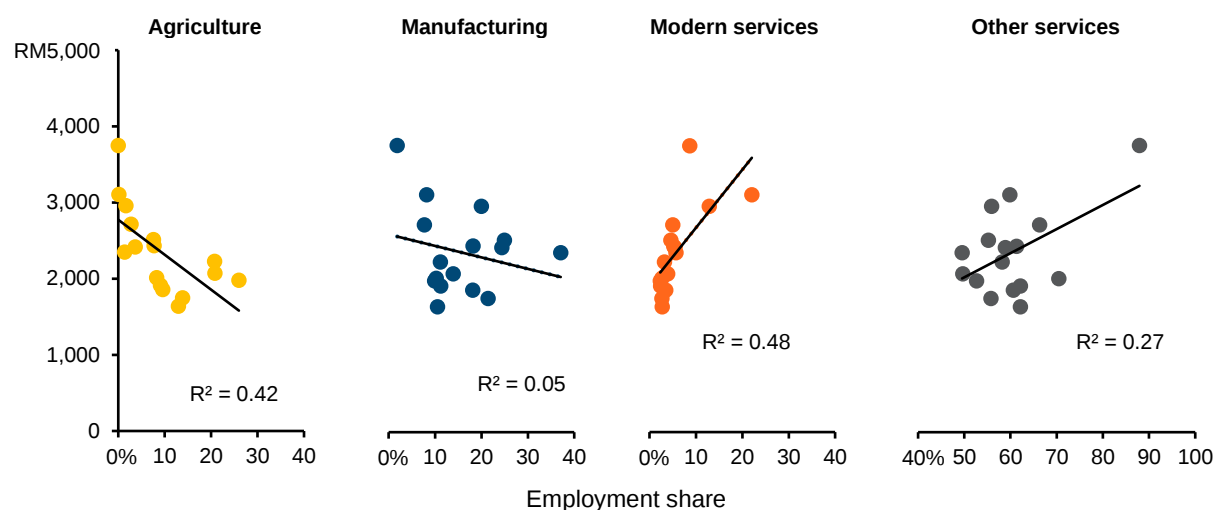
Note: Refers to citizen wages only. Data in 2019 prices.

Source: DOS (2020i), KRI calculations

In this light, the nature of economic activities is closely linked to state-level wages outcomes. Figure 2.35 shows that states with higher shares of agriculture and manufacturing employment have lower real median monthly wages, while states with larger services employment shares have higher median monthly wages, with the relationship stronger for employment in *modern services* i.e., employment in *modern services* exerts a significant premium on wages. However, wage dispersion, measured by the ratio of mean to median monthly wages, tends to be lower for states with higher manufacturing employment shares⁵³. While correlation does not imply causality, these findings reflect the significance of the geographical concentration of *modern services* in explaining the inter-state wage disparities, and the importance of manufacturing sector as a potential equaliser of income outcomes among states.

⁵³ See Appendix B.

Figure 2.35: Median monthly wages and employment share, by economic activity, 2019



Note: Refers to citizen wages only.

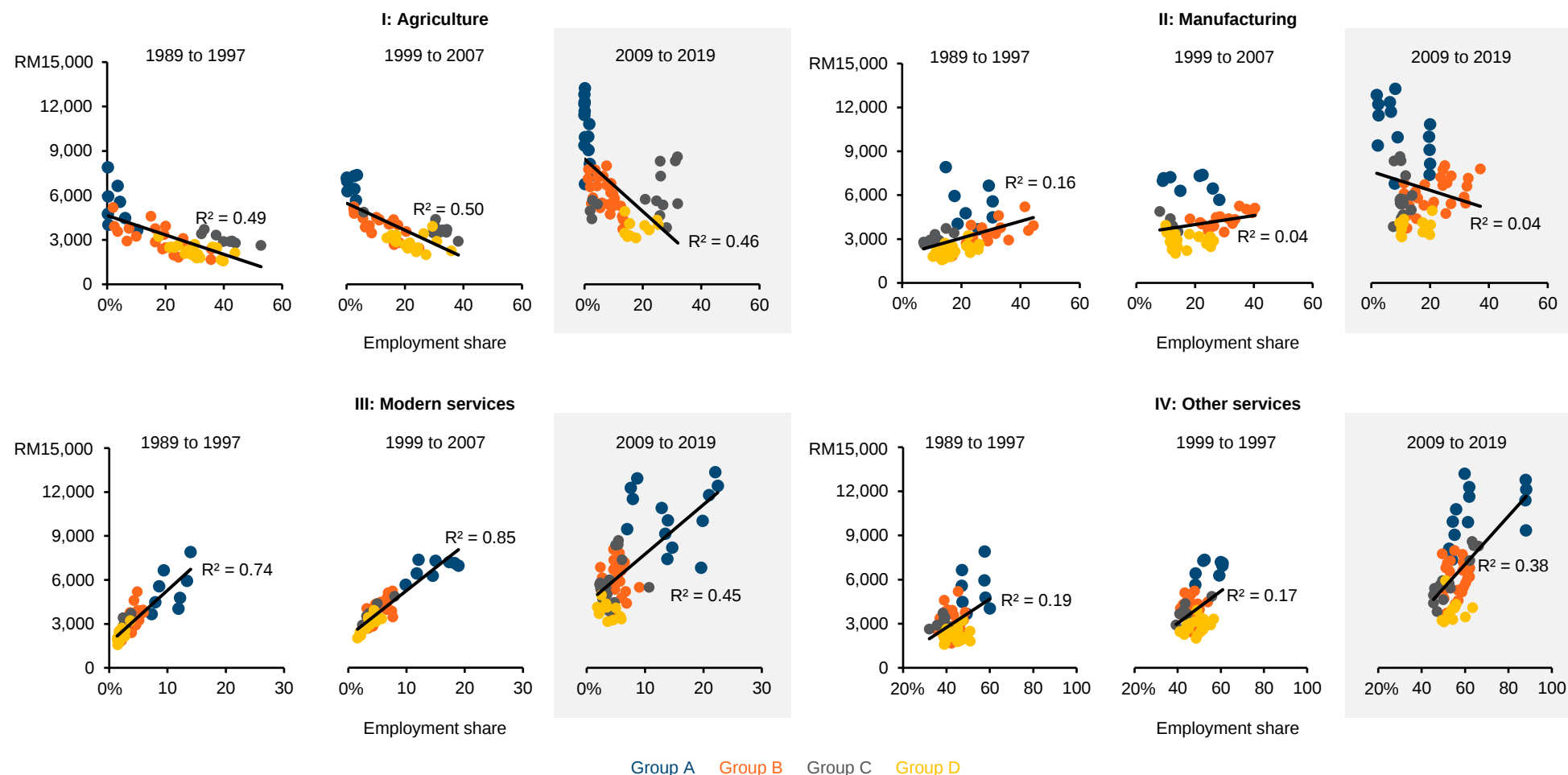
Source: DOS (2020i), DOS (2019d), KRI calculations

Household income, of which two-thirds is employment-related, could also indicate how well workers are compensated. Figure 2.36 shows real mean monthly household income negatively correlating with employment share in agriculture (Panel I), while manufacturing employment share positively correlates with wage levels, except in the last decade (Panel II). As industrial employment declines in significance, the association between household income and services, especially *other services*, has become stronger instead (r-squared in Panel IV). Figure 2.36 also demonstrates how wages Group A states, which have much higher shares *modern services* employment shares, have dispersed further away from the other states in the last decade (Panel III). That said, manufacturing and *other services* employment could still be important for the distributional landscape of income because they are significantly associated with lower household income dispersion and inequality⁵⁴.

Analyses of the relationships between earnings and structural change are central to understanding individual economic well-being as households actively generate income by working, and not passively by investing in unit trusts or owning other assets. Better remunerated jobs are also more likely to have elements of *decent work*. This is discussed further in Box 2.2.

⁵⁴ See Appendix B for discussion.

Figure 2.36: Real mean monthly household income and employment share, by state, economic activity and period



Note: Data in 2019 prices. Data unavailable for Putrajaya and Labuan before 2007. See Appendix B for detailed discussion.

Source: CEIC (n.d.), DOS (2020b), KRI calculations

Box 2.2: Decent work and adequate earnings

An important part of decent work is earning *decent wages*. *Decent work* considers whether the worker is earning enough. Several indicators have been proposed by international organisations to estimate the size of working individuals not earning adequate pay. These include the working poverty rate, the share of low-paid employment and the living wage. Analyses are mostly based on ILO data, which relies on an international threshold for the measurement of working poverty and low-paid employment rates.

Absolute working poverty rate: not meeting basic needs

The absolute working poverty rate published by the ILO captures **employed persons** not earning enough to meet basic necessities like food, clothing and shelter. It is termed absolute because the threshold is fixed and does not vary over time. In 2019, it was estimated that only 0.002%, or 301 employed individuals in Malaysia were living in poverty (i.e., below the absolute poverty line of USD 1.90 per day)⁵⁵. This is known as the working poverty rate and Malaysia has kept its near-zero record since 2009, similar to the rates achieved by some high-income countries. However, with revisions for a more higher poverty line for households in Malaysia, the actual absolute working poverty rate might still be higher than the one reported here.

Relative low pay rate: meeting basic needs but nothing more

Low-paid employment, in turn, is a relative measure estimating employed persons who earn below two-thirds of the median wage. Employed persons in low-paid employment are those who can afford the basics but nothing more. This is termed relative because the threshold changes following the median wage. In Malaysia, two-thirds of overall nominal median wages amounted to RM1,628 in 2019. If we follow the relative poverty rate methodology suggested by DOS (2020), the threshold is lower at half the median household income; here, we use half the median wages or RM1,221 in 2019.

Based on the threshold used for international comparison (two-thirds of the median wage), in 2015, 28.3% of all full-time employed persons (~2.4 million) in Malaysia were estimated to be in low-paid employment⁵⁶. Despite the slight improvement between 2011 and 2015, the 2015 rate for Malaysia was still higher than neighbouring countries like Indonesia and Vietnam; economically comparable countries like Chile and Mexico; and high-income countries like Japan and South Korea⁵⁷.

⁵⁵ ILO (n.d.b)

⁵⁶ Ibid.

⁵⁷ Nur Thuraya and Siti Aiysyah (2020)

Relative living wage: beyond basic needs

The living wage goes one step further by estimating the income level needed for a minimum acceptable living standard beyond just meeting basic needs⁵⁸. According to BNM (2017), this entails “the ability to participate in society, the opportunity for personal and family development, and freedom from severe financial stress”⁵⁹. The living wage is a relative measure too, varying across time, with location and household composition.

Living wage estimates for Kuala Lumpur by Bank Negara Malaysia were derived from the representative basket of goods and services reflecting minimum acceptable living standard for urban dwellers and confirmed by focus group discussions. As shown in Table 2.6, the living wage estimates range between RM2,700 and RM6,500 per month for 2016. Utilising primary and secondary data, the Employees’ Provident Fund (EPF) produced similar estimates ranging between RM1,870 and RM6,620 per month for 2019⁶⁰. Since the living wage is primarily based on living costs and differs with household size, it is typically higher than the legislated minimum wage. Similarly, the lowest estimates by EPF and BNM are higher than the legislated minimum wage of RM1,200 for major cities, effective January 2020.

Table 2.6: Living wage estimate for Kuala Lumpur

	BNM estimates for 2016	EPF estimates for 2019
Single	RM2,700	N.A
With a car	N.A	2,490
Without a car	N.A	1,870
Married		
No children	4,500	4,420
With two children	6,500	6,620

Source: BNM (2017), EPF (2019)

Single young employed persons not earning living wage

Using KRI School-to-Work Transition Survey (SWTS)⁶¹ data, single employed persons not earning living wages can be estimated by extrapolating the above-mentioned thresholds across time. After accounting for inflation, almost 88% of SWTS respondents aged 15 to 29 who were working full-time and living in Kuala Lumpur earned below the living wage proposed by BNM (RM2,831 in 2018 prices). This is consistent with the average starting basic salary for fresh graduates published by Malaysian Employers Federation (MEF) of RM2,618 for honours degree holders and the median wage of RM2,419 for Kuala Lumpur in 2018, both lower than the provisional living wages⁶².

⁵⁸ BNM (2017)

⁵⁹ Ibid.

⁶⁰ EPF (2019)

⁶¹ This SWTS dataset is from a nationwide survey conducted by KRI between 2017 and 2018. It is used in this report as micro dataset from the Salaries and Wages Report is not publicly accessible. For more information on the SWTS, see KRI (2018a).

⁶² MEF data from MEF (2019) and average mean salaries for graduates from DOS (2020i).

The shares of employed persons without living wages also dropped for the much lower thresholds estimated by the EPF, with only 4% of respondents earning less than the minimum wage set in 2018. The findings in Table 2.7 suggest while most young employed persons in Kuala Lumpur earned more than mandated minimum wage level, many still earned below the living wage.

Table 2.7: Young employed person share, by earning relative to living wage, Kuala Lumpur, 2018

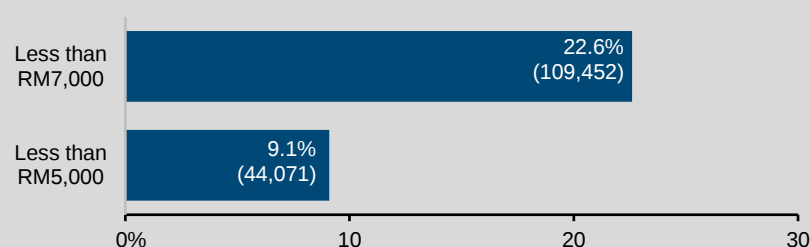
	Living wage		Full-time worker, aged 15 – 29, single and living in KL	
	Nominal	Real (2018 prices)	Earning below	Earning above
Single, 2016 (BNM)	RM2,700	RM2,829	88%	12%
Single, with a car, 2019 (EPF)	2,490	2,474	77	23
Single, without a car, 2019 (EPF)	1,870	1,858	52	48
Minimum wage, 2018	1,000	1,000	4	96

Note: This table was updated from Nur Thuraya and Siti Aiysyah (2020).
Source: KRI (2018b), KRI calculations

Households earning below living wage

Beyond single young employed persons, Figure 2.37 estimates the share and size of households (potentially with more than one income earner) not earning the living wages. As shown in Table 2.6, the threshold for couples without children is between RM4,420 and RM4,500, while the threshold for couples with children is between RM5,730 and RM6,620. Comparing these thresholds to household income, potentially more than 100,000 households in Kuala Lumpur (22.6%) may be earning below the living wage as their household income were under RM7,000 in 2019 (Figure 2.37)⁶³. This is consistent with the BNM estimate of about 27% in 2016⁶⁴. This rate is much higher than the reported national absolute and relative poverty rates of 5.6% and 16.9% respectively⁶⁵. However, there is a gap between people counted as “poor” and people not earning enough to afford the minimum acceptable living standard.

Figure 2.37: Household share, by income bracket, Kuala Lumpur, 2019



Note: Total number of households in bracket.
Source: DOS (2020a), KRI calculations

⁶³ This estimation assumes that household income only consist of paid employment, a household consists of at least two individuals (average household size in Kuala Lumpur is 3.3 persons, based on the Household Income and Expenditure Survey 2019) so they are comparable to the estimated decent wage benchmark for married individuals. The range between RM5,000 and RM7,000 still stands even after adjusting for inflation (2019 prices).

⁶⁴ BNM (2017)

⁶⁵ DOS (2020a)

2.8 Economic Structure and Nature of Firms

How did the nature of establishments or firms change, as the economic structure of different states evolved? Aside from employment patterns, another angle to look at is the nature of firms in each state. Most firms in Malaysia are small- and medium-sized enterprises (SMEs) (907,000 establishments, or 98.5% of total establishments), employing almost two-thirds the workforce (5.7 million workers, or 64.7% of total employment) in 2015. The prevalence of SMEs is relatively similar among states (more than 98% of total establishments), with the exception of Putrajaya and Selangor, where the shares of SMEs were 95.8% and 97.8% of total establishments in 2015.

Employment tended to concentrate in small and micro firms instead of medium firms (Figure 2.38). Group D states have the highest incidence of employment by micro SMEs, and Kelantan has the largest shares of micro- and small-firm employment (87.8% of total employment in the state). Medium-firm employment was concentrated in Groups A and C, with Putrajaya having the largest medium-firm employment share (42.9% of total employment in the federal territory).

Figure 2.38: SMEs employment share, by size and state group, 2015

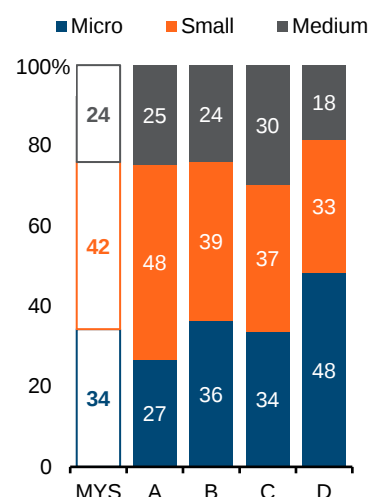
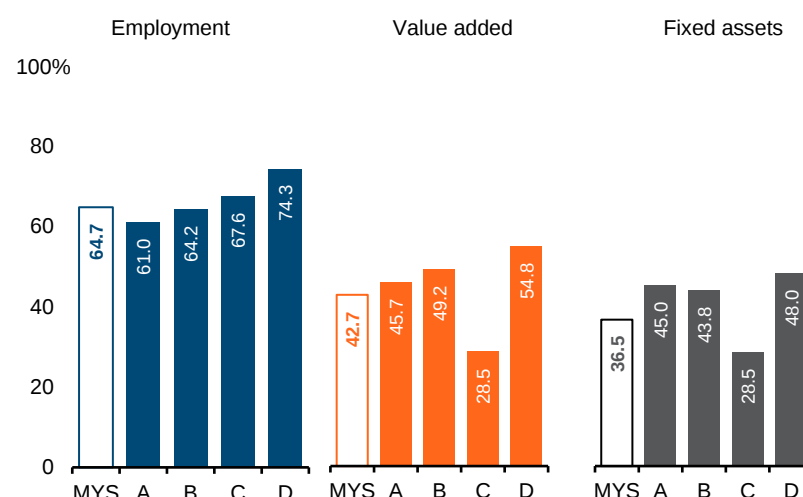


Figure 2.39: SMEs employment, value added and fixed assets share, by state group, 2015

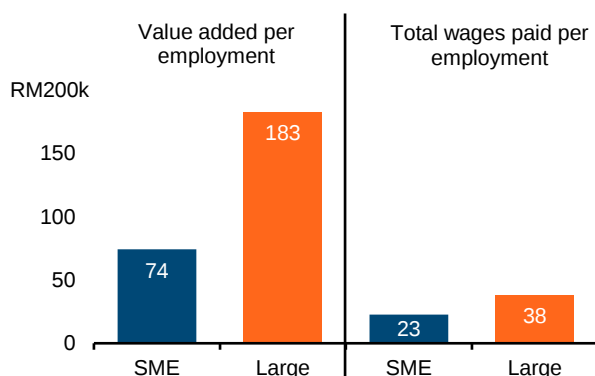


Source: DOS (2016a), KRI calculations

Despite their prevalence, SMEs only account for 42.7% of the total value added in the economy and 36.5% of the total fixed assets (Figure 2.39). In Group C, while SMEs accounted for 67.6% of total employment, their value added was only 28.5% of total value added; 38.0% for Sabah and 20.8% for Sarawak. Meanwhile, Labuan's SMEs share of value added was high at 74.9%. The low shares of SMEs value added could be associated with high concentration of agriculture employment in Sabah (14.6%) and Sarawak (8.5%), while states with more services employment tend to have larger shares of value added.

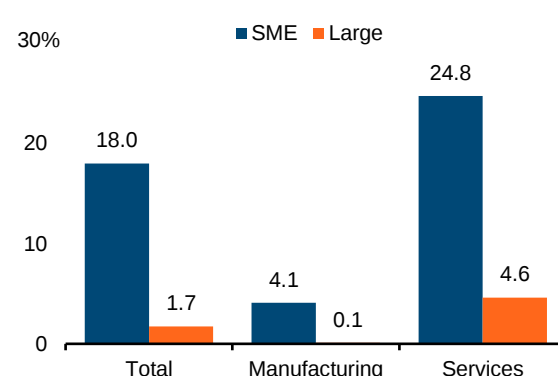
There are several differences between SMEs and large firms. SMEs tend to be less productive (proxied by value added per employment) and pay lower average wages (Figure 2.40). They also tend to have more non-standard workers, especially SMEs in services (Figure 2.41) as well as low skilled for both citizen and non-citizen workers (Figure 2.42).

Figure 2.40: Annual value added and total wages paid per employment, by firm type, 2015



Source: DOS (2016a), DOS (2017a), KRI calculations

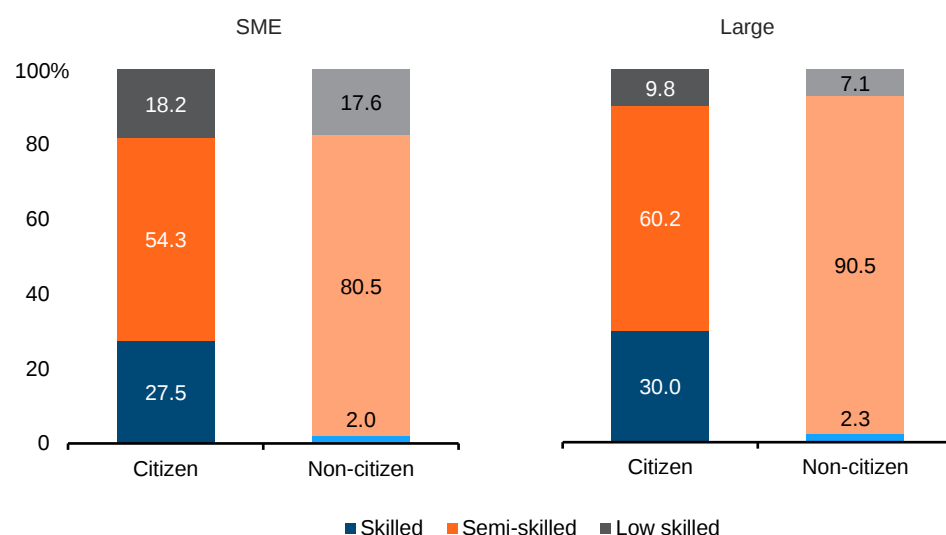
Figure 2.41: Non-standard employment share, by firm type and economic activity, 2015



Note: Non-standard workers here refer to non-full-time employees.

Source: DOS (2016a), DOS (2017a), KRI calculations

Figure 2.42: Employment share, by skill level, firm type and workers' citizenship, 2015



Source: DOS (2016a), DOS (2017a), KRI calculations

Differences in the distribution of SMEs in different regions and the observation that workers in SMEs are typically less skilled and they are paid lower, could also contribute to observed differences in workers and household incomes in different states. However, SMEs will likely remain the main employer in the economy. Given various SMEs-related policies in Malaysia, an important task for future research is to assess whether the development of SMEs has produced *decent work* for the workforce too.

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03

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SECTION 3

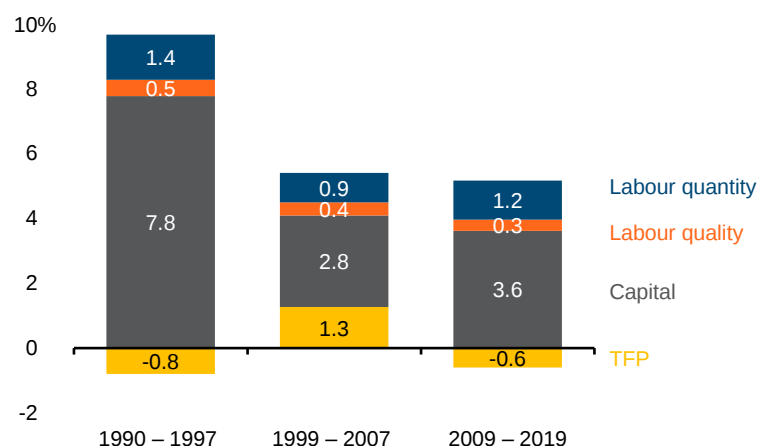
CAPITAL, TECHNOLOGY AND WORK

While the earlier two sections of this report look at quantitative and qualitative aspects of work and the workforce, this section examines other key factors of production, particularly capital and technology. The links among these factors shapes the country's economy, driving future growth.

3.1 Capital Accumulation

Capital accumulation is essential to Malaysia's development and is a major driver of growth⁶⁶. Figure 3.1 shows that during 1990 to 1997, GDP growth was largely driven by investments, and it continues to drive growth in subsequent years albeit more moderately. Meanwhile, the contribution of labour to growth relied mostly on quantity of employment and not their quality; and contribution of productivity improvement (proxied by total factor productivity, TFP) remained limited.

Figure 3.1: Contribution to GDP growth, by production factor and selected period



Note: Data only available since 1990. *Labour quantity* estimated from total employment and hours worked; *labour quality* estimated from employment and wages by educational attainment; *capital* estimated from productive services provided by capital assets (ICT and non-ICT); *TFP* is the residual growth after accounting for other factor productions. Data are adjusted for changing ICT prices.

Source: The Conference Board (2019), KRI calculations

However, it should be noted that the primary role of capital investments is not uncommon in growth stories. On average, capital investments contributed to two-thirds of GDP growth for multiple countries between 2009 and 2018⁶⁷. Moreover, the contribution of productivity improvement to growth remains limited for many countries and in advanced countries, productivity growth slowed down⁶⁸. Unsurprisingly, this led to numerous discussions and debates on new sources of growth for both developing and developed countries⁶⁹.

⁶⁶ Micheaux (2018)

⁶⁷ Based on estimates for India, China, Indonesia, Malaysia, Singapore, Thailand, the US and Germany, reported in The Conference Board (2019).

⁶⁸ See Wroński (2019), Eichengreen, Park, and Shin (2015) for broad discussion. See Jones (2017), Chiacchio, Gradeva, and Lopez-Garcia (2018), Cardarelli and Lusinyan (2015) for country/regional discussions.

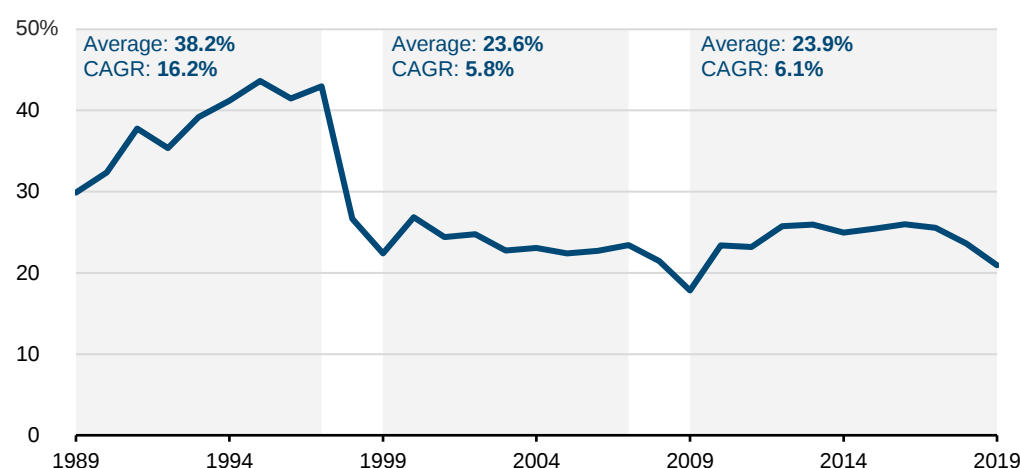
⁶⁹ For example, see OECD (2019).

3.1.1. Capital investment and changing economic structure in Malaysia

In this section, capital investment and accumulation refer to additions and changes in inventories of *tangible fixed assets* such as structures (e.g., buildings, premises), machineries and equipment. Capital could also refer to *financial assets* (e.g., equity) and *intangible capital* (e.g., software, database, research and development (R&D), copyrights, branding and design)⁷⁰.

When Malaysia was rapidly industrialising, capital accumulation averaged 38.2% of total GDP, much higher than in recent decades (Figure 3.2). Between 1989 and 1997, capital formation expanded by an average of 16.2% annually. However, the average share and growth of capital declined after the AFC. At the start of deindustrialisation, capital was 23.6% of GDP, almost 15 percentage points lower than the average share in the previous period and grew more slowly at 5.8% per year. Since 2009, capital accumulation improved slightly growing at 6.1% per year, averaging to 23.9% of total GDP. However, the share and growth rates of capital formation have never recovered to pre-AFC values.

Figure 3.2: Capital formation per GDP share, 1989 – 2018



Note: Shaded areas refer to Period 1 (1989 to 1997), Period 2 (1999 to 2007) and Period 3 (2009 to 2018) respectively. Calculations based on constant prices.

Source: World Bank (n.d.b), KRI calculations

Despite its slower growth trends, Malaysia's capital stock level has expanded over time. Net capital stock expanded from RM0.4 billion in 1955 to RM3.2 trillion in 2018⁷¹, most of which was in services (68.5%), following the ascendance of this sector in the economy (services was 56.9% of total GDP by 2019). Manufacturing output, which accounts for more than 20% of GDP, only has a capital share of about 11%⁷².

⁷⁰ Haskel and Westlake (2017). Capital could also be a form of wealth, see Piketty (2013).

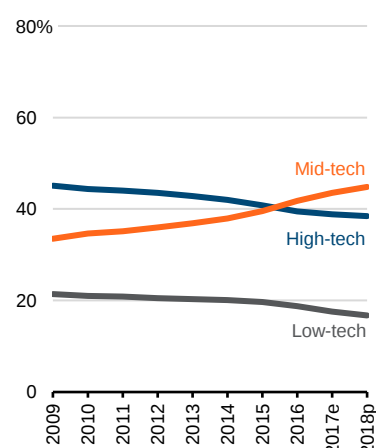
⁷¹ Net capital stock measures the net present value of future capital services. Values are in current prices, based on DOS (2011), DOS (2019c)

⁷² Calculations based on net capital stock and GDP by industry between 2009 and 2018 from DOS (2019b), CEIC (n.d.).

Closer analysis on net capital stock shows that in recent years, the accumulated capital in manufacturing is increasingly concentrated in mid-technology manufacturing at the expense of high-technology manufacturing (Figure 3.3)⁷³. By 2018, the share of accumulated capital within the manufacturing sector was 38.4% for high-technology manufacturing, 44.8% for mid-technology and 16.7% for low-technology. Between 2009 and 2018, overall net capital stock in manufacturing expanded by 8.2% annually. The growth rate was fastest for mid-technology manufacturing (11.8% per year), followed by high-technology (6.3% per year) and low-technology manufacturing (5.3% per year). Reflecting earlier regional findings, states concentrated in low-technology manufacturing may have limited growth potential due to slower asset accumulation.

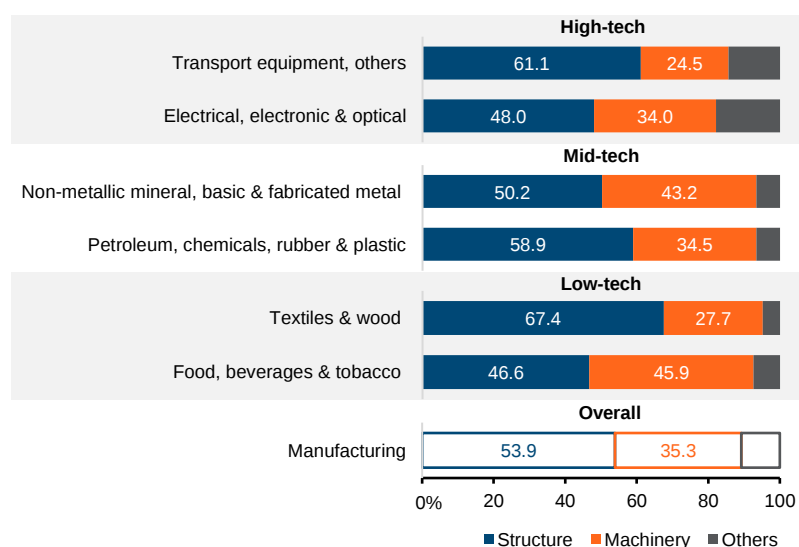
Most manufacturing fixed assets are in the form of *physical structures* (54%), although there have been some variations in distribution by asset type in different manufacturing subsectors (Figure 3.4). The growth of *structure* and *machinery* assets in mid-technology manufacturing was also fastest, at 14.6% and 7.8% per year respectively. Over the years, fixed assets were also increasingly accumulated in *modern services*, though most of it is still concentrated in *other services* (Figure 3.5). The differences between the type of assets accumulated by different economic activities (Figure 3.4 and Figure 3.6) could be due to the nature of their economic activity. For example, manufacturing of food items requires more machineries than cooking and serving the food to customers.

Figure 3.3: Manufacturing net capital stock share, by subsector, 2009 – 2018



Note: e is estimated, p is predicted.
Source: DOS (various years.c),
KRI calculations

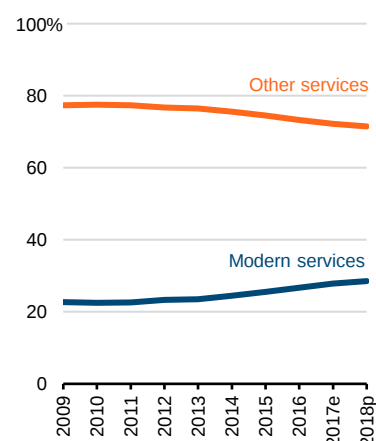
Figure 3.4: Manufacturing net capital stock share, by subsector and asset type, 2018



Note: 2018 figures are predicted values.
Source: DOS (2019c), KRI calculations

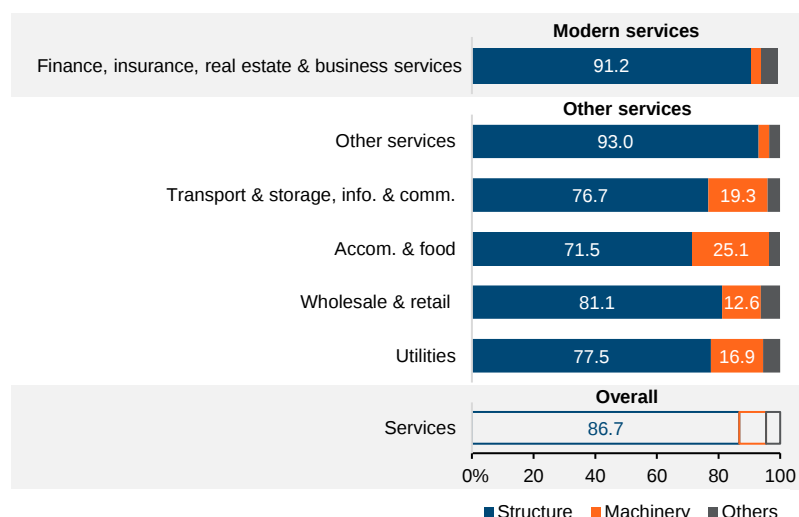
⁷³ *High-technology* manufacturing refers to manufacturing of E&E products and transport equipment. *Mid-technology* manufacturing refers to manufacturing of petroleum, chemical, rubber, plastic, non-metallic mineral, basic metal and fabricated metal products. *Low-technology* manufacturing refers to manufacturing of food, beverages, tobacco, textiles, wearing apparel, leather, wood, furniture, paper and printing products.

Figure 3.5: Services net capital stock share, by subsector, 2009 – 2018



Note: e is estimated, p is predicted.
Source: DOS (various years.c),
KRI calculations

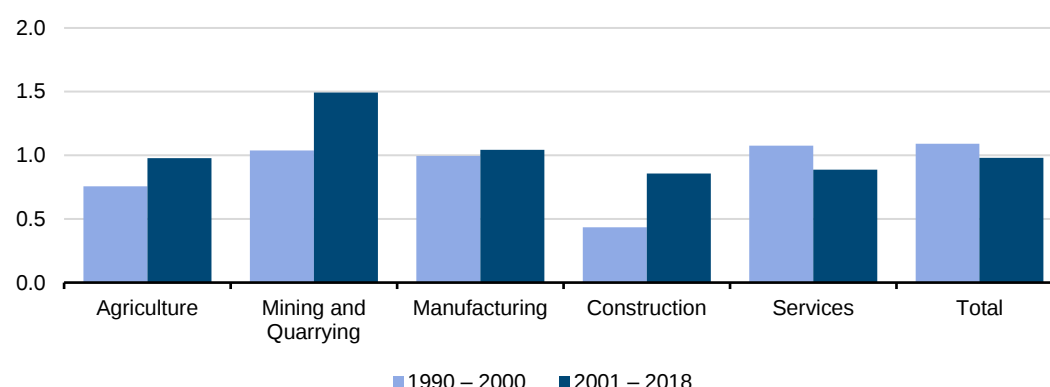
Figure 3.6: Services net capital stock share, by subsector and asset type, 2018



Note: 2018 figures are predicted values.
Source: DOS (2019c), KRI calculations

The relationship between fixed asset accumulation and output can be illustrated by the incremental capital to output ratio (ICOR), which estimates capital efficiency (a lower ICOR indicates greater efficiency)⁷⁴. Figure 3.7 shows the overall ICOR marginally improving, mainly due to capital efficiency improvement in services. However, efficiency declined in other sectors. In services, *modern services* was found to be the least capital-efficient (highest ICOR) and in manufacturing, low-technology manufacturing was the most capital-efficient (lowest ICOR) in the last decade (Figure 3.8).

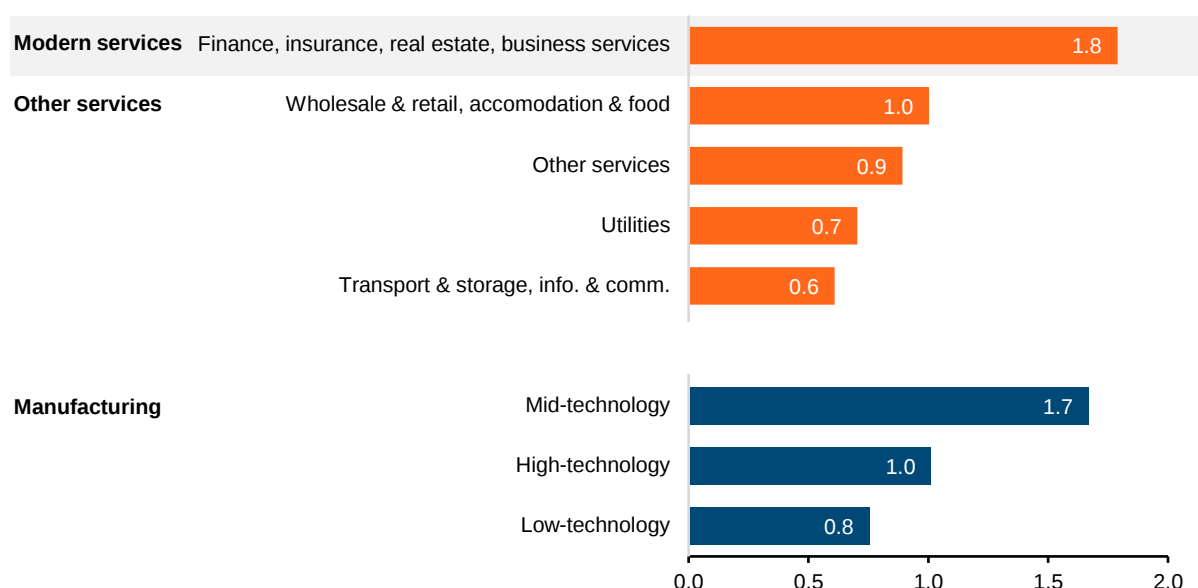
Figure 3.7: Incremental capital to output ratio, by economic activity, 1990 – 2000 and 2001 – 2018



Note: Data in current prices, selected years based on data availability. 2018 figures are predicted values.
Source: DOS (various years.c), CEIC (n.d.), KRI calculations

⁷⁴ ICOR is a standard measure of investment efficiency but is limited as it assumes no diminishing returns to capital, no lag between investment and production, and full capacity utilisation. The measure is also static.

Figure 3.8: Incremental capital to output ratio, by subsector, 2009 – 2018



Note: Data in current prices, selected years based on data availability. 2018 figures are predicted values.

Source: DOS (various years.c), CEIC (n.d.), KRI calculations

Nonetheless, the above observations centre on fixed assets growth trends, saying little about quality. Some assets, such as machineries, could become cheaper without sacrificing performance while contributing positively to production growth. Other assets, such as structures, could be inflated by rising land prices (and therefore, the value of the capital), but have limited effects on actual productivity improvements.

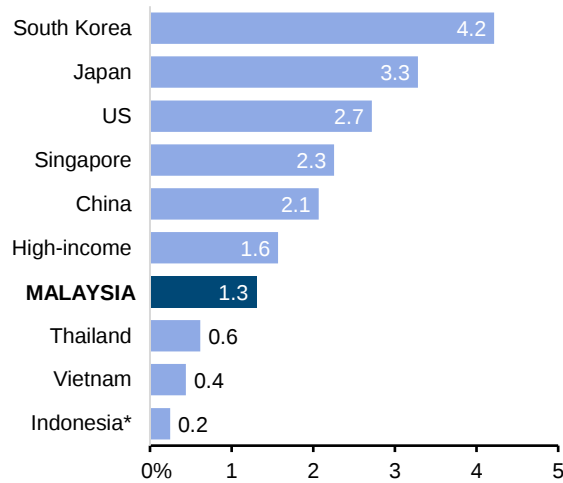
In the new economy, capital has also evolved to become more knowledge-based and intangible. Branding, organisational structure, R&D, intellectual property, software and databases play increasingly important role in the growth of firms. In the US, the rising importance of intangible assets began in the 1990s, while in some economies (the UK and Sweden), intangible assets accumulation was found to be as high as tangible assets⁷⁵. In fact, while productivity growth has been stagnant in developed nations, the growth of the most productive firms, which accumulate these intangible assets, remained strong⁷⁶.

Estimates for Malaysia's intangible asset values are limited, although levels can be implied by some indicators. Malaysia's spending on R&D remains low, compared to advanced and high-income countries (Figure 3.9). Compared to some countries, fewer Malaysian manufacturing firms spend on R&D, with the prevalence being lower among firms in services (Figure 3.10).

⁷⁵ Haskel and Westlake (2017)

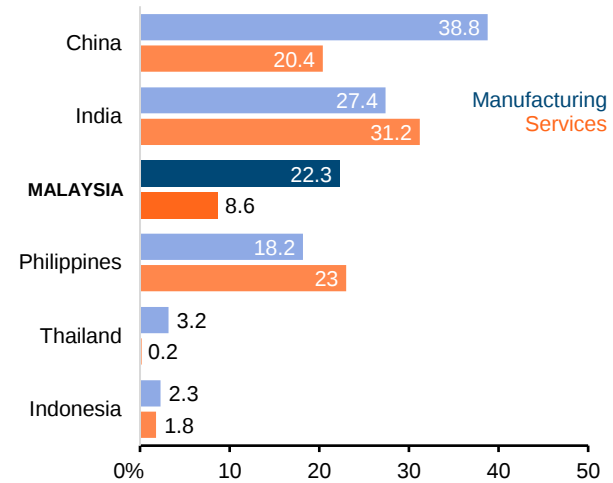
⁷⁶ OECD (2019)

Figure 3.9: R&D expenditure per GDP share, by selected country, 2015



Note: Refers to capital and current domestic expenditure on R&D in business enterprise, government, higher education and private non-profit, covering basic and applied research, and experimental development. *2016 data for Indonesia.
Source: World Bank (n.d.b)

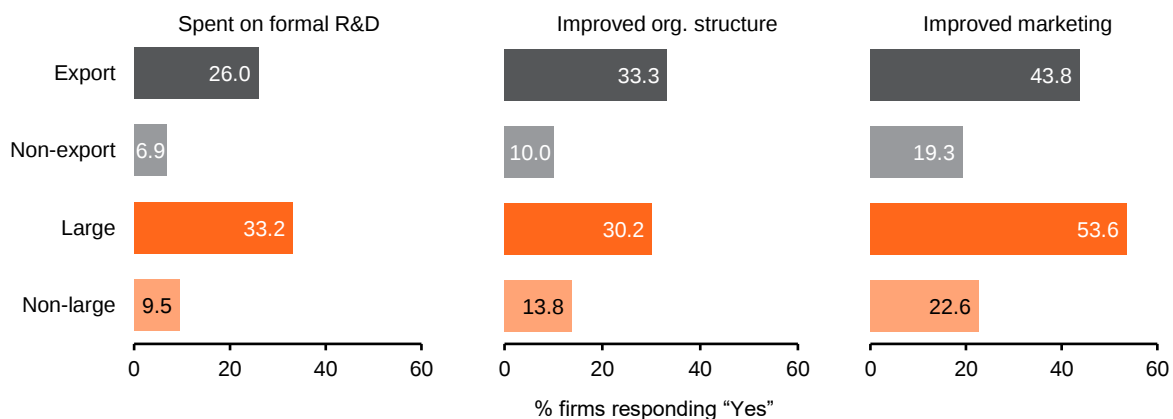
Figure 3.10: Firms that spent on formal R&D share, by economic activity and selected country, latest available year



Note: Survey does not cover all countries and years covered are different.
Source: World Bank (n.d.a)

Among companies surveyed in the World Bank's Enterprise Survey in 2015, 33.2% of large firms in Malaysia spent on R&D, while the percentage was 9.5% for companies with less than 100 workers (Figure 3.11). Export-oriented companies were also more likely to conduct R&D. Moreover, larger and more export-oriented firms experienced improvements in organisational structure and marketing. However, most firms in Malaysia are neither large nor exporters, which means the value and new accumulation of intangible assets are likely to remain limited. This might constrain Malaysia's ability to generate sustainable long-term economic growth.

Figure 3.11: Firms share by spent R&D, improved organisational structure and improved marketing, by firm type, 2015



Note: Export firms, defined as having more than 10% of sales exported (directly or indirectly), made up 19.0% of firms surveyed. Large firms, defined as having 100 or more employees, comprised 4.2% of firms surveyed. Questions are based on R&D spending, improved organisation structure and improved marketing in the past three years.
Source: World Bank (2015b)

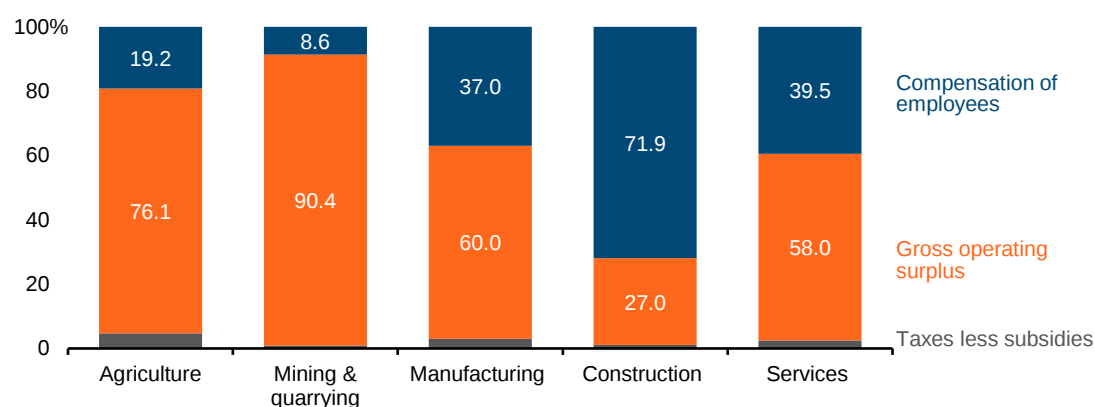
3.1.2. Distribution of value creation

In addition to driving growth, non-human factors of production also receive much of the income from economic activities. This could be proxied via capital's share of the country's income from national income account⁷⁷. In this approach, national income is divided into compensation of employees (COE), gross operating surplus (GOS) and taxes less subsidies (TLS). Complementing analysis of labour and household income shares in Ng, Tan, and Tan (2018) and Part I SOH2020, this distribution of the capital income share is proxied by the GOS. However, this indicator combines fixed capital consumption, profits and mixed income from self-employment.

Between 2005 and 2019, the share of GOS declined by 5.5 percentage points from 65.9% of GDP to 50.2% of GDP, at the back of rising labour income share (6.4 percentage points, from 29.5% of GDP to 35.0% of GDP)⁷⁸. The income distribution also differs by economic activity (Figure 3.12). In two key employment sectors, manufacturing and services, employees' income shares were only about 40%, and much higher in construction.

Meanwhile, less than 20% of income in agriculture and mining & quarrying went to labour. This could be the consequence of several things. In both sectors, total workers are fewer compared to other economic activities, so the overall labour income share is smaller. The high prevalence of self-employed in agriculture means some labour income is categorised as mixed income in the GOS. Mining & quarrying is also capital-intensive, and high GOS values could be due to high fixed capital consumption.

Figure 3.12: GDP share, by income source and economic activity, 2019



Note: 2019 figures are predicted values.
Source: DOS (2020g), KRI calculations

In light of rising self-employment, refining estimation methods for the GDP by income approach must also be considered⁷⁹. Currently, income of the self-employed workers is categorised as mixed income in the GOS, but they are both micro-enterprises and “labour”. Consequently, GOS share might be smaller when mixed income from the self-employed is excluded.

⁷⁷ See BNM (2014).

⁷⁸ DOS (2020g), KRI calculations

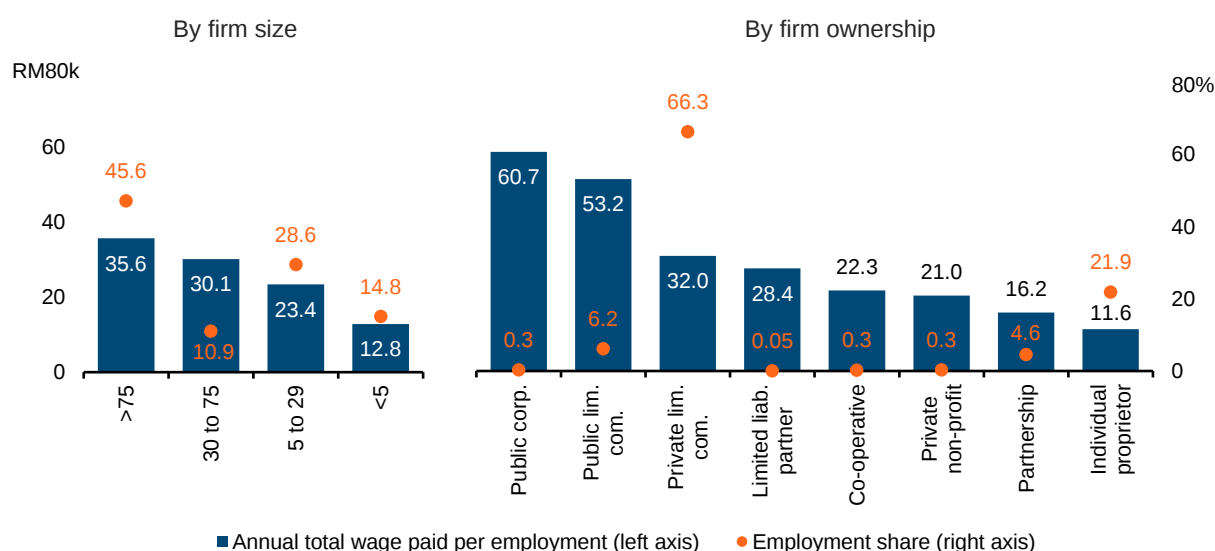
⁷⁹ See ILO (2016c).

Moreover, some workers enjoy some share of profits accumulated by firms, obtaining much higher remuneration compared to other workers. The use of stock-based remuneration among top management personnel has been rising⁸⁰. However, such schemes only apply to publicly listed companies, excluding large shares of workers employed by non-listed companies in the country. Through policies such as productivity-linked wage systems (PLWS), benefits of better firm performance from improved workers' productivity could be passed on to workers. However, the adoption of PLWS remains limited, excluding more than two-thirds of employees and larger segments of the workforce⁸¹.

The roles of *between-firm* and *within-firm* income inequality are also important to understand the unequal distribution in the economy. The rise of highly productive “frontier” firms which well-compensate some workers creates further divergences in remuneration among workers in different companies. Within firms, pay inequality is driven by the absence of any wage premium for low skilled workers, in addition to the higher pay of corporate managers, CEOs and high-skilled professionals⁸².

Analysing wage inequality between and within firms typically requires matched income datasets between *employers* and *employees*, for which Malaysian data is scarce. Figure 3.13 shows the extent of some pay differentials among firms. On average, large firms (with more than 75 workers) paid 2.8 times more than micro-firms (less than five workers). Meanwhile, the average pay in public corporations and public limited companies almost doubled private limited companies, which employed the largest number of workers in 2015. Sole proprietors, which employed the second largest number of workers, had the lowest average pay.

Figure 3.13: Annual total wages paid per employment and employment share, by firm size and ownership, 2015



Source: DOS (2017a)

⁸⁰ Based on observations from the United States, see Roe and Papadopoulos (2019), Larcker and Tayan (2019).

⁸¹ BNM (2018)

⁸² ILO (2016b)

Though imperfect, pay differential between top management and workers is also a proxy for within-firm inequality. In the US, Mishel and Wolfe (2019) found that CEOs in the US firms were compensated 278 times the pay of workers in the private sector and have grown by more than 1,000% between 1978 and 2018. Internationally, the ratio of CEO to average worker varies, though estimated ratios are typically above 100⁸³. In Malaysia, CEO remuneration averaged to RM9.6m⁸⁴, which was about 238 times the annual remuneration for an average worker in 2018⁸⁵. These staggering figures warrant some concern about within-firm salary inequality as a potential contributor to the uneven salary outcomes in the labour market.

Value creation depends on both economic activity and firm behaviour. Eventually, these affect how income is distributed between workers and non-worker factors of production, as well as among workers. The heterogeneous nature of economic activities requires deeper sector-specific understanding to improve outcomes and support decent employment. While workers' welfare remains important, it should be complemented by policies that do not impede investments, capital accumulation and firm competitiveness to support sustainable economic growth.

3.2 Technology and Future of Work

While discussions on the future of work typically focus on technology, technology is not the only trend shaping the future of work. Other mega trends have been identified including but not limited to, demographic shifts, climate change, globalisation of the value chain and trade tensions⁸⁶. The trends shaping the future of work are perpetually shifting and affecting one another, yet this section focuses primarily on technology.

There is an overwhelming consensus that technology can bring about long-term economic benefits. However, more often than not, this comes with costs⁸⁷. In a long-term perspective, while technological advancement can fundamentally advance a firm's productivity, its distributional consequences can be complex. From a shorter timeframe, if history is any guide, job insecurity will intensify for workers possessing skills or jobs decreasingly in demand. Without proper distributional policies, this impact on employment can yield greater inequality as it tends to favour skilled workers and capital owners⁸⁸.

Furthermore, not all technologies are equal. Technologies that drastically alter economies and societies, known as general purpose technologies (GPTs), are few and far between. Three technologies have been identified as catalyst to the first three industrial revolutions with the fourth purported to be on its way, if not already here. First came the steam engine (approximately 1750s to 1830s), second electricity (1850s to 1900s), and then the computer and internet (1950s to 1970s).

⁸³ Statista (n.d.)

⁸⁴ SC (2019)

⁸⁵ Based on annual average salary in DOS (2020i), adjusted for 1.1 bonus reported for overall bonus payout in ILMIA (2019).

⁸⁶ ILO (2019)

⁸⁷ Mokyr, Vickers, and Ziebarth (2015)

⁸⁸ Brynjolfsson and McAfee (2014)

It has been argued that we are entering the fourth industrial revolution (IR4) in the 21st century with technologies building on the third digital revolution⁸⁹. IR4 is seen as distinct from the past in three important ways: it moves faster than ever before (pace); it is able to affect multiple, if not all, industries (spread); and it can substitute and surpass not only physical but also mental human abilities (nature)⁹⁰. The two oft-cited technologies accompanying IR4 are the Internet of Things (IOT) and Artificial Intelligence (AI), where the former refers to interconnected technologies across multiple realms with little to no human interaction, and the latter refers to machines that can think and perform with human intelligence.

Concern over machines replacing humans is not new and can be traced as early as 1811, with the Luddites, artisans who destroyed textile apparatus that they believed was threatening their jobs and livelihood. In 1930, John Maynard Keynes predicted widespread technological unemployment due to “our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour”⁹¹. Isaac Asimov, a biochemist and science fiction author, forecasted in 1964 that by 2014, there will be “few routine jobs that cannot be done better by some machine than by any human being.”⁹² Similar concerns remain to this day.

Past, present and future impacts of technology on work has been much discussed in the literature. Drawing on existing studies, this section will look at how technology has led to the decline of semi-skilled jobs in the past, the rise of independent work and digital economy in the present, and the potential scale of future technological unemployment as labour is replaced by technology.

3.2.1. Present emerging trends: rise of independent work and digital economy

One defining feature of current labour landscape is the burgeoning significance of independent work. Independent work refers to those not engaged in traditional full-time positions with clear employment relations. There are multiple permutations of this including the gig, contract, daily paid and self-employed workers. While these types of workers are not identical, they share similar risks (e.g., higher income insecurity and inadequate social protection) and enjoy similar benefits (e.g., greater autonomy and flexibility).

There is no authoritative estimate of “gig workers” in Malaysia. Part of the reason is that there is no single platform that captures all types of gig work which includes any “job of uncertain duration in any field, whether it’s a driver, a freelance artist or an interim CEO”⁹³. Even the Online Labour Index developed by the Oxford Internet Institute—the first economic indicator of the online gig economy—excludes platform “gig workers” like e-hailing riders, covering only specialised freelancers such as programmers.

⁸⁹ The term Industrial Revolution 4.0 (IR4) was arguably promulgated by the founder and Executive Chairman of the World Economic Forum, Klaus Schwab, in his book entitled the Fourth Industrial Revolution.

⁹⁰ KRI (2017a)

⁹¹ Keynes (1963)

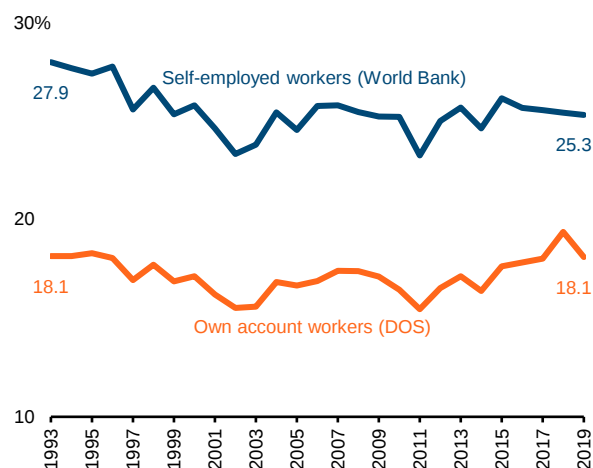
⁹² Asimov (1964)

⁹³ McGovern (2017)

These heterogenous gig workers often also outside the current regulatory framework, making it harder to identify and count them. For instance, unlike employees who have to be registered in the employment-related social protection schemes, or sole proprietors who have to register their businesses, existing schemes for gig workers are voluntary. There is limited take-up of programmes offered by the Malaysia Digital Economy Corporation (MDEC) and the Social Security Organisation (SOCSO). Only 459,455 gig workers were registered with the MDEC in 2020 and about 52,000 actively contribute to SOCSO's self-employment social security scheme⁹⁴. These figures are much lower than total own account workers in the informal sector of 900,800 in 2019. Nevertheless, while the actual number of gig workers in Malaysia remains unknown, growing numbers of gig workers on different platforms suggest that such work is fast growing⁹⁵.

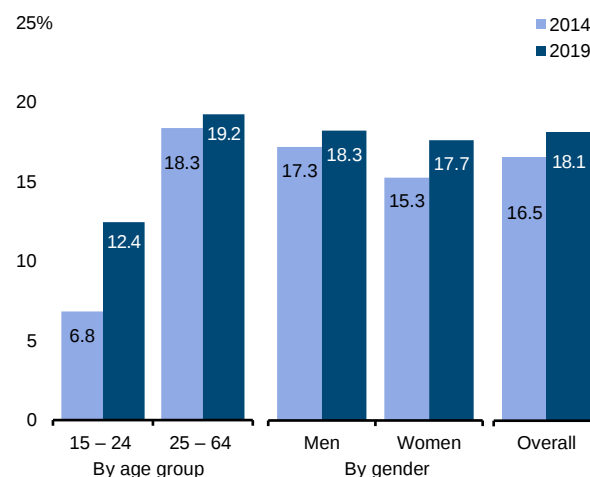
As gig workers are considered independent workers, their size can be estimated by observing *own account workers* in the Labour Force Survey. These are individuals who produce goods and services on their own (18.1% or 2.7 million in 2019) and their share has been growing despite a modest decline in 2018 – 2019 (Figure 3.14). In the past five years, this employment status has seen the largest increase⁹⁶, fuelled by greater participation among youths and women (Figure 3.15). Distinguishing employed individuals as either salaried or non-salaried, the World Bank estimated that non-salaried workers (i.e., the self-employed) in Malaysia account for 25.3% of total employment or approximately 3.8 million people. The data gap between DOS and the World Bank is primarily because the World Bank figure is based on ILO modelled estimates and self-employment categorisation that goes beyond own account workers to include those whose remuneration depends on profits like *employers* and *unpaid family workers*.

Figure 3.14: Self-employed and own account workers share, 1993 – 2019



Source: DOS (2020b), World Bank (n.d.b)

Figure 3.15: Own account workers share, by age group and gender, 2014 and 2019



Source: DOS (2015), DOS (2020c), KRI calculations

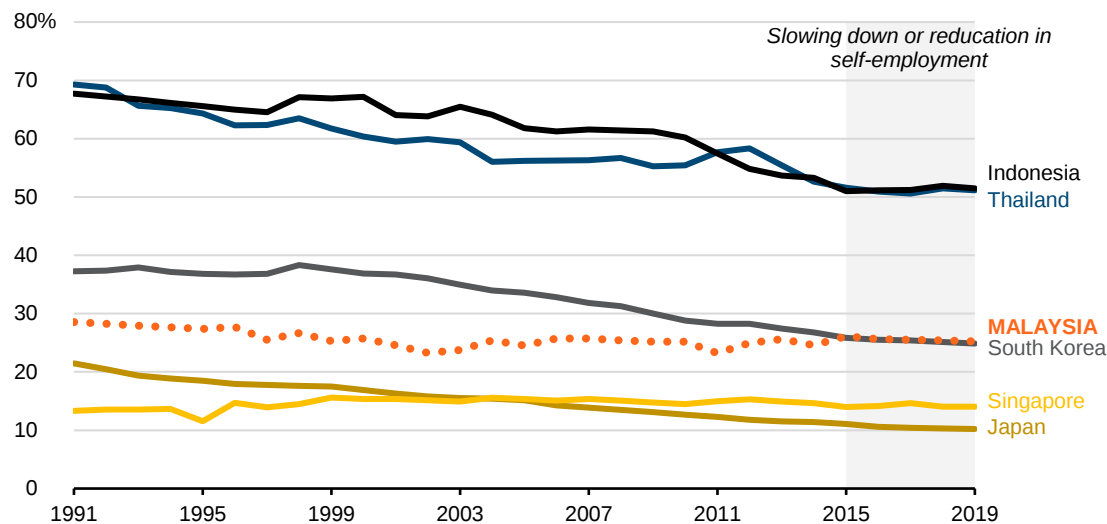
⁹⁴ Zurich (2020) and Hawati (2020). The SOCSO scheme was previously only offered to drivers in the transportation industry. It was expanded to 19 other sectors in January 2020, explaining the meagre number of reported active contributors.

⁹⁵ In less than five years of e-hailing operations, e-hailer drivers in Klang Valley were estimated to be between 50,000 to 60,000, much higher than the 37,000 registered taxi drivers. Source: KRI (2017a)

⁹⁶ Refer 2.5. in the previous section.

While richer countries tend to have less self-employed workers, the share of self-employment has flatten or increased, in recent years (Figure 3.16), suggesting that independent work is likely to remain prominent. This coupled with the reported preference for self-employment among Malaysians⁹⁷, increasing internet user and the growth of young own account workers, suggest that independent work is here to stay.

Figure 3.16: Self-employment share, by selected country, 1991 – 2019



Source: World Bank (n.d.b)

The digital economy⁹⁸ in Malaysia is also growing. DOS estimated that the digital economy contributed to 18.5% of GDP in 2018. Between 2015 and 2018, the greatest expansion occurred in e-commerce which rose 0.3 percentage points from 5.6% to 5.9%, against 0.1 percentage points from 12.5% to 12.6% for the Information and Communication Technology (ICT) industry (Figure 3.17). In 2019, eMarketer ranked Malaysia among the top ten fastest growing e-commerce countries by online retail sales growth⁹⁹. A Google and Temasek/Bain report valued the Malaysian internet economy at 11b international dollars (INT\$) in 2019, more than double its 2015 value (growing 22.4% annually)¹⁰⁰. By 2025, the internet economy is expected to rise further to INT\$26b, albeit slower at 18.2% annually between 2015 and 2025 (Figure 3.18).

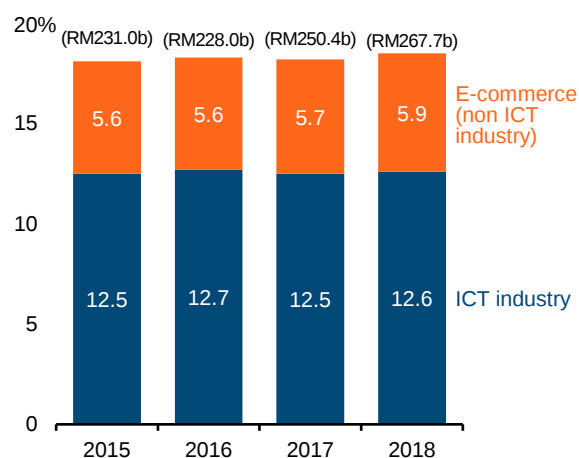
⁹⁷ A Zurich-University of Oxford study found that 38% of Malaysian respondents who are in full-time employment have plans to leave their jobs in the next year to work as a freelancer, which is higher than the global average of 20%. Source: Zurich (2020)

⁹⁸ DOS refers to digital economy as “a wide range of economic activities that use digitised information and knowledge to deliver the production”. Source: DOS (2019e)

⁹⁹ eMarketer (2019)

¹⁰⁰ Google & Temasek /Bain (2020)

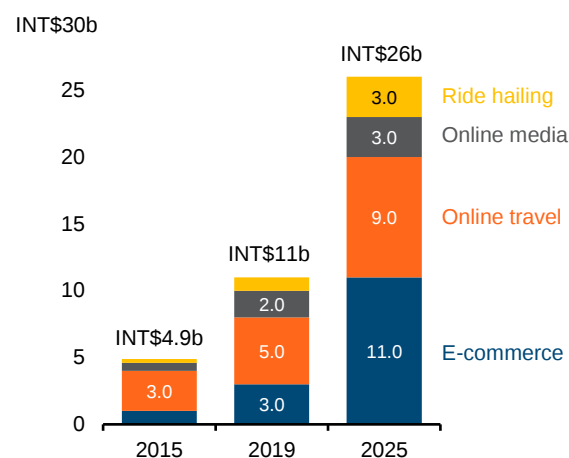
Figure 3.17: Digital economy contribution per GDP share, 2015 – 2018



Note: E-commerce here refers to economic transactions conducted through the internet/computer networks. Total value of digital economy contribution in brackets.

Source: DOS (2019e)

Figure 3.18: Gross merchandise value of internet economy, 2015, 2019 and 2025

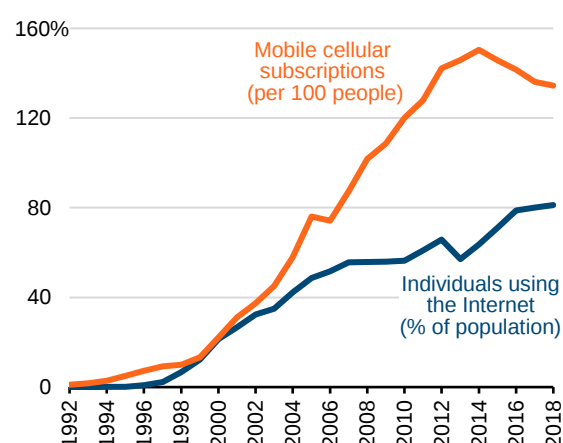


Note: E-commerce here refers to sites that sell products like groceries, personal care and electronic devices.

Source: Google & Temasek /Bain (2020)

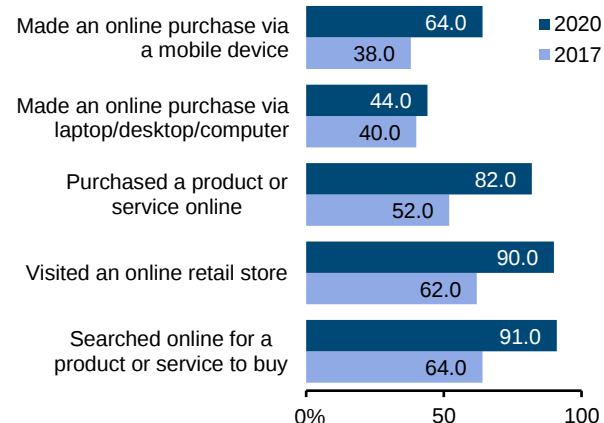
These positive market trends are consistent with the increasing number of internet users, high mobile subscriptions (Figure 3.19) as well as changes in consumer behaviour (Figure 3.20). The high rate of mobile users is highlighted as Malaysian internet connectivity and usage have been primarily facilitated by increasing mobile phone use. Malaysians are also among the most engaged mobile internet users in the world (in terms of hours spent) in 2019¹⁰¹.

Figure 3.19: Mobile cellular subscriptions and individuals using the internet share, 1992 – 2018



Source: World Bank (n.d.b)

Figure 3.20: Internet users aged 16 – 64 share, by self-reported e-commerce activity, 2017 and 2020



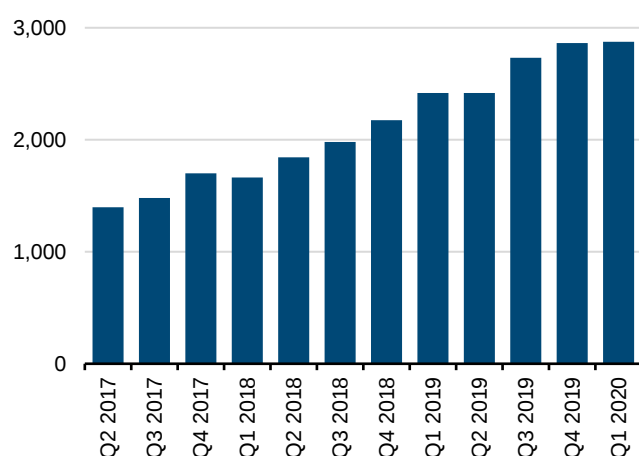
Source: Globalwebindex survey data for Malaysia as cited in Kemp (2017), Kemp (2020)

¹⁰¹ For more details, refer *ibid*.

The increasing use of the internet, as facilitated by the mobile internet, can also be seen through employment. While neither exhaustive nor representative¹⁰², the growth of employees hired by the top 50 e-commerce players may indicate rising labour demand by the burgeoning internet economy (Figure 3.21). Beyond the internet, the ICT industry employed 1.1 million workers, contributing 7.6% to total employment in 2018¹⁰³. While its share of total employment remained stagnant for the past three years, it grew 1.8% annually. This is slightly higher than the growth of overall employment as well as employment in non-ICT industries (Figure 3.22).

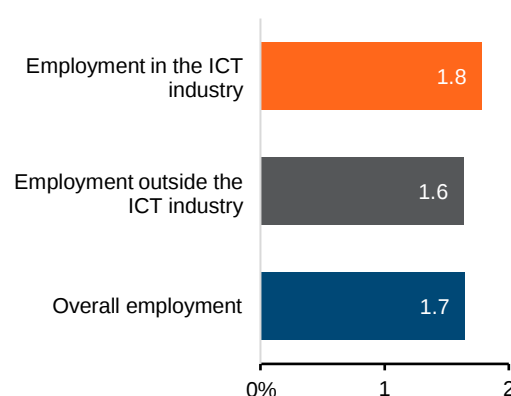
The rising importance of the digital economy is indeed opportune for the country to provide jobs, especially for the growing technologically-savvy educated workforce. It also complements the rising numbers of the self-employed who rely on the internet to connect with potential clients. The government has also encouraged more businesses to go digital with various grants, especially since the Covid-19 crisis. However, digital economy growth should be complemented with the development of a resilient and safe digital economy ecosystem and workforce. Concerns related to cyber security, accessibility and affordability of fast internet and social protection gaps remain pertinent in creating a robust environment for the digital economy.

Figure 3.21: Total employees hired by top 50 e-commerce companies, Q3 2017 – Q1 2020



Note: See iPrice (2020) for caveats on the coverage of these statistics
Source: iPrice (2020)

Figure 3.22: Employment annual growth, by subsector, 2015 – 2018



Source: DOS (2019e), KRI calculations

¹⁰² Data on employees by the top 50 e-commerce players (with 100,000 visitors per-month or 100,000 social media followers) excludes e-ticketing, financial services, rental services, insurance, delivery service, food & beverage, meta-search, couponing, cashback websites and e-commerce who solely provide classified ads/P2P services as well as e-commerce who were initially a physical store. The data is based on information displayed on firms' LinkedIn. Source: iPrice (2020)

¹⁰³ Note that, ICT employment (1.12m in 2018) is not the same as employment in information and communication (0.22m in 2018). The key distinguishing feature is the lack of emphasis on technology in the latter, whereby it focuses on the production and distribution of information. The former exclusively refers to workers in industries that produce ICT products as their primary activities. Source: DOS (2019e)

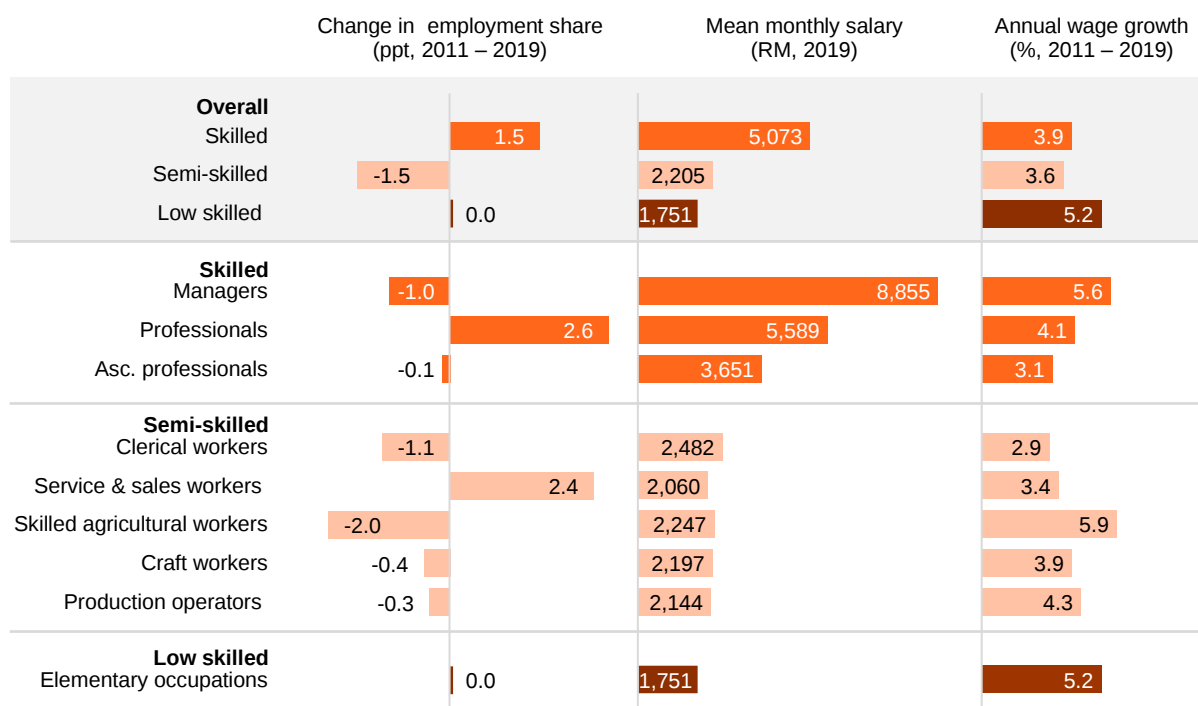
3.2.2. Past trends: job polarisation

Earlier studies on the job displacing impacts of technological change, notably by Autor, Katz, and Kearney (2006), Goos and Manning (2007), and Goos, Manning, and Salomons (2009), propose that occupations with predominantly routine tasks are more liable to automation. This, in turn, can be observed through patterns of job polarisation with a rise in skilled and low skilled occupations and declining semi-skilled occupations. While this can be caused by several factors like offshoring, the introduction of labour-saving technologies has been argued as key impetus.

It is worthwhile to note that technological impacts on the labour market are not concentrated in one industry. This is the reason why technological impacts need to be examined at the occupational, not sectoral level. Similarly, the shift to services economy does not satisfactorily explain job polarisation¹⁰⁴. As technology modifies tasks, its impact can actually be felt across the economy, with some jobs affected more than others.

Using employment and wages data classified using ILO skill classification, job polarisation is observed in Malaysia¹⁰⁵. This polarising pattern becomes clearer when occupations are grouped by skill level, where semi-skilled and middle-wage occupations (bars in lightest orange) contracted, except for *sales & services workers* (Figure 3.23).

Figure 3.23: Job and wage polarisation, by skill level and occupation, 2011 – 2019



Note: Skill classification follows ILO (n.d.c) and DOS (various years.b).

Source: DOS (2020i), DOS (2020b), KRI calculations

¹⁰⁴ Acemoglu and Autor (2010)

¹⁰⁵ ILO skill classification, also used by DOS, differs slightly from that used by Autor (2014). For instance, Autor (2014) refers to low skilled occupations as service & sales workers and elementary occupations, while the ILO only refers to low skilled occupations as elementary occupations.

Job polarisation has been argued to accompany wage polarisation. The decline in semi-skilled employment goes hand in hand with declines in wages for semi-skilled jobs reflecting a declining demand for routine tasks. While this can be observed in some developed countries like the United States, this effect of job polarisation on wages is less evident in Malaysia¹⁰⁶.

Between 2011 and 2019, instead of declining wage growth, diminishing share of semi-skilled jobs (1.5 percentage points, from 26.1% of total employment to 27.5%) saw slower wage growth relative to other occupations (by 3.6% annually) (Figure 3.23). While this has a U-shaped pattern, expected wage polarisation obscured by occupational breakdown. Contrary to the wage polarisation hypothesis, *skilled agricultural workers* also experienced the largest decline in employment shares (2.0 percentage points, from 8.2% of total employment to 6.2%) yet saw the largest growth in wages (5.9% annually). Similarly, *service & sales workers* saw the second largest rise in employment (by 2.4 percentage point, from 20.3% of total employment to 22.6%) with sluggish wage growth (3.4% annually).

This dissonance between earnings and employment distribution could be explained by Malaysia's reliance on migrant workers, and the decline of blue-collar or manual occupations such as *craft workers* and *operators* with the boom of *services & sales jobs*¹⁰⁷. On the first point, the high wage growth among semi-skilled blue-collar workers can be explained by the reliance of low skilled migrant workers especially within the same sector. As low skilled migrant workers complement semi-skilled workers¹⁰⁸, their employment boost the productivity of semi-skilled workers. These productivity gains may then explain the continued wage growth among semi-skilled workers. On the second point, sluggish wage growth for service & sales workers could be due increasing semi-skilled labour supply amid the decline of other semi-skilled blue-collar jobs.

If these trends of hiring low skilled migrant workers and increasing *service & sales jobs* are reversed, job polarisation would be expected to be more pronounced¹⁰⁹. This possibility is not far-fetched considering the stagnant growth of the non-citizen workforce in recent years (peaking in 2013 at 15.4%) and continued growth of tertiary-educated workforce (28.8% in 2018). If technological change continues to be biased towards skilled employed persons, job polarisation may be more uneven, as unskilled labour could expect lower wages and higher unemployment.

¹⁰⁶ While the impact of technology on occupation distribution is almost universal, the impact on wages is not. Acemoglu and Autor (2010) attributed this to the difference in labour markets' response to these technological changes with some countries having more incentives to adopt technologies than others.

¹⁰⁷ For further discussion, refer KRI (2017b).

¹⁰⁸ World Bank (2015a) reported that semi-skilled workers with lower secondary education benefitted the most from the hiring of low skilled migrant workers. While ILMIA (2020) observed a positive correlation between the presence of foreign workers and the wages of local workers, the result is not statistically significant.

¹⁰⁹ KRI (2017b)

On the other hand, others maintain that inverse job polarisation (rise in semi-skilled occupations relative to skilled and low skilled occupations) is also conceivable. This is because the net effect of new technologies on jobs also depends on several factors including market outcomes (e.g., labour demand), policies (e.g., labour regulation, trade policy, etc.) and societal changes (e.g., ageing society). For example, the financial savings from using automation technology in healthcare may eventually become large enough for high-wage health occupations to be affected¹¹⁰. Graetz and Michaels (2018) also found low skilled workers, not semi-skilled ones as postulated by job polarisation theory, are more affected by rising robotisation in developed economies between 1993 and 2007.

In Malaysia, the growing skill mismatch discussed in Section 2.4 coupled with a staggering number of *services & sales workers* (about one-fourth of workforce) implies that most firms are not involved with cutting edge technologies, at least in the near term. For instance, while the share of manufacturing's contribution to GDP at 21.9% was comparable to developed countries like Japan (20.8%) and Singapore (18.4%), less than half was contributed by high technology industries (Figure 3.24). In contrast, for South Korea, Japan and Singapore, the larger shares of manufacturing value added came from medium- and high-tech production.

Modest wage growth in manufacturing (5.0% annually for 2010 to 2019¹¹¹) suggests limited incentives for firms to invest in technology for productivity gains. Malaysian manufacturing firms that are small in size (96% are SMEs) involved in lower value-added manufacturing activities are less likely to embrace automation¹¹². The lower relative price for labour and the nature of manufacturing are also consistent with low robot density in Malaysia. In 2016, only 34 industrial robots were installed for every 10,000 employees in Malaysia, lower than the world average of 74 (Figure 3.25).

While the economic incentives to adopt new technologies might not be strong, Malaysia has been positioned as one of the countries that is well-prepared to be competitive in IR4. This is based on the two indices developed by the World Economic Forum (WEF), which measures an economy's readiness by its structure and drivers of production. A country is considered a leading economy when it has large and/or complex production and is able to capitalise on new technologies. Interestingly, Malaysia's favourable performances in both its structure and drivers of production made it one of two non-high-income countries¹¹³ deemed to benefit from technological advances in production (Figure 3.26). While the future is uncertain, this indicates that Malaysia may be on the right trajectory to benefit in the new era. If the net effect of accelerating technological change is positive, the policy agenda should focus on maximising long-term benefits (e.g., encouraging productivity-inducing technology) whilst minimising short-term costs (e.g., managing the impact of job displacement).

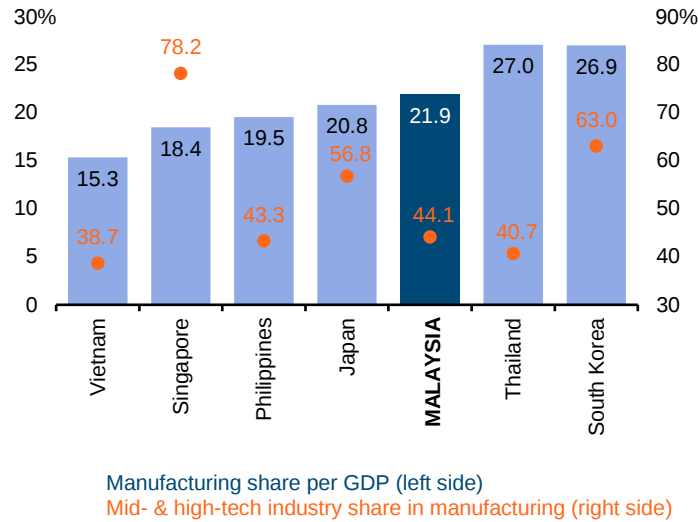
¹¹⁰ Böhm (2020)

¹¹¹ Computed using data from DOS (2020i).

¹¹² KRI (2017b)

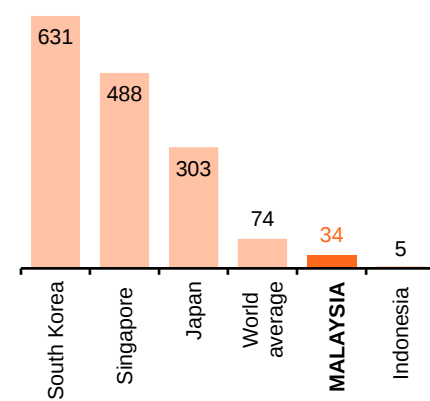
¹¹³ The other country is China, which is an upper middle-income country.

Figure 3.24: Manufacturing value added share, by subsector and selected country, 2017



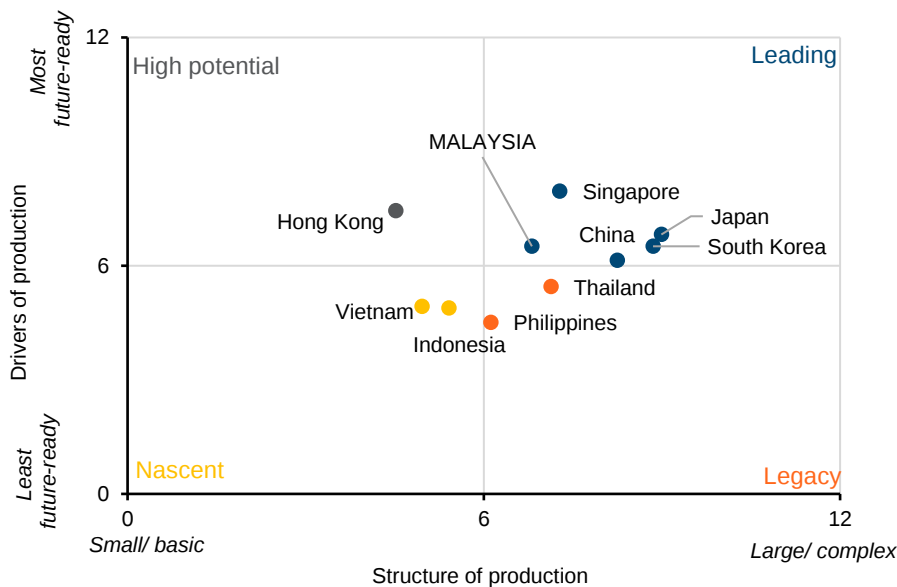
Note: See the data source for more details on the calculations. Medium and high-tech industries include construction.
Source: World Bank (n.d.b)

Figure 3.25: Robot density (number of installed industrial robots per 10,000 in manufacturing), by selected country, 2016



Source: IFR (2020)

Figure 3.26: Map of readiness assessment, by selected country



Note: Horizontal axis consist of indices (varying between 0 and 12) measuring a country's production scale and complexity. Vertical axis consists of indices (varying between 0 and 10) measuring a country's drivers of production, which include technology & innovation, human capital, global trade & investment, institutional framework, sustainable resources, and demand environment. Countries with lower score for drivers of production are deemed to be less ready to capitalise IR4.0 to transform their production systems. See WEF (2018) for details on the calculation.
Source: WEF (2018)

3.2.3. The future: widespread technological unemployment?

What will be the short-run human costs of this anticipated changes? According to Frey and Osborne (2013), technology can now replace almost all jobs, not just routine jobs. There are, however, exceptions. Occupations most resistant to automation will need to meet three criteria: creative intelligence, social intelligence and physical dexterity. Public relations, fashion designer and surgeons are examples that exhibit these characteristics.

Based on these characteristics, the authors categorised 702 detailed occupations in the United States into low-risk (less than 30% probability of computerisation), medium-risk (more than 30% and less than 70%) and high-risk (more than 70%). Frey and Osborne subsequently found that 47% of jobs, especially among low-wage and low skilled occupations in the United States, are at high risk of being computerised. Since then, their automation probabilities have been used in multiple other studies to estimate how susceptible jobs are to automation¹¹⁴.

Utilising a similar methodology, KRI (2017) found that almost half of all jobs in Malaysia in 2015 (54.1%) could be at great risk of being automated¹¹⁵. When the analysis is extended across multiple years, the shares of occupations with high- and medium-risk saw a slight decline between 2011 and 2016 (Figure 3.27). The shares of occupation with low risk of automation also saw an average increase of 1.6 percentage points over five years ranging from 15.5% to 17.0%. As illustrated in Figure 3.28, these encouraging trends are driven by increasing skilled occupations (with lower risk of being automated) and decreasing semi-skilled occupations (with higher risk of being automated). Examples of these occupations are included in Table 3.1.

Figure 3.27: Estimated employment share, by automation risk, 2011 – 2016

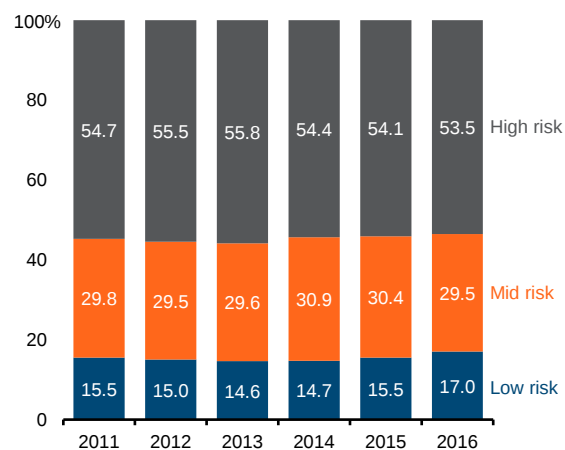
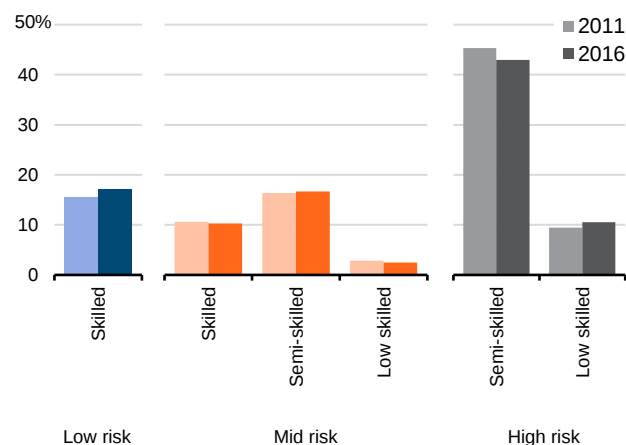


Figure 3.28: Estimated employment share, by automation risk and skill level, 2011 and 2016



Note: Skill classification follows ILO (n.d.c)

Source: Data cited in KRI (2018c), methodology based on KRI (2017a), KRI calculations

¹¹⁴ Some of these works are cited in footnote 10 in ILO (2016a).

¹¹⁵ KRI (2017a)

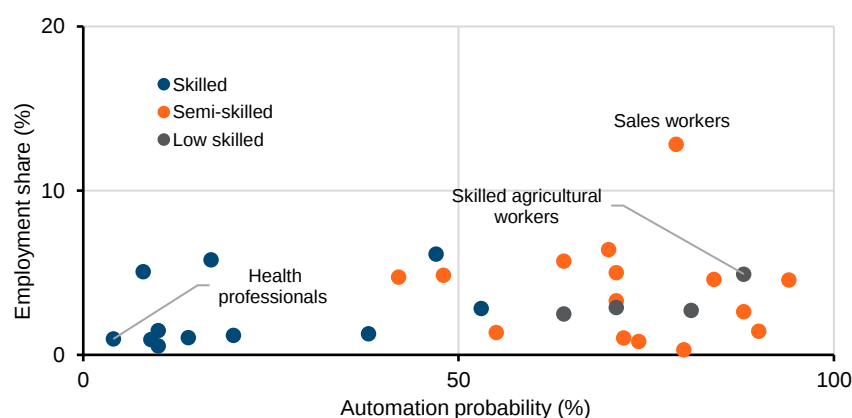
Table 3.1: Example of occupations, by automation risk and skill level

Automation risk	Skill level	Example
Low risk ($\leq 30\%$)	Skilled	Professionals like doctors and teachers
	Skilled	Associate professionals like health technicians
Mid risk ($>30\%$ and $<70\%$)	Semi-skilled	Personal services workers like chefs and hairdressers
	Low skilled	Cleaners and helpers
High risk ($\geq 70\%$)	Semi-skilled	General and keyboard clerks
	Low skilled	Elementary occupations like unskilled agricultural labourers

Source: KRI illustration

Sales & services workers were found to be the most susceptible to automation and vulnerable to job displacement. Worryingly, they are the largest share of workers in Malaysia, (22.6% of total employment in 2019) Conversely, jobs such as *health & teaching professionals* are less likely to be replaced by technology. As evident in Figure 3.29, while skilled occupations still face risk of automation, semi-skilled occupations (orange dots) are more liable of being automated.

Figure 3.29: Employment share versus automation probability, 2016



Source: Data cited in KRI (2018c), methodology based on KRI (2017a), KRI calculations

Similar results were found when the same method was applied to KRI's School-to-Work Transition Survey (SWTS) database¹¹⁶. Figure 3.30 shows that 48.7% or almost half of the surveyed full-time young employed persons aged 15 to 29 held jobs with high risk of automation. Disaggregating jobs by income and educational attainment also shows that occupants of jobs at higher risk of automation tended to earn lower incomes (average monthly income of RM1,500) and are more likely to be non-graduates (only 7% with bachelor's degree or more) (Figure 3.31). Treating the younger employed persons' responses as realised labour demand, this implies that low-income jobs that do not require high levels of education are more likely to be susceptible to automation¹¹⁷.

¹¹⁶ This SWTS dataset was from a nationwide survey conducted by KRI in 4Q 2017/1Q 2018. For more information on SWTS, see KRI (2018a).

¹¹⁷ Frey (2019) arrived at a similar conclusion in the case of the United States.

Figure 3.30: SWTS respondents' share, by job's automation risk, 2018

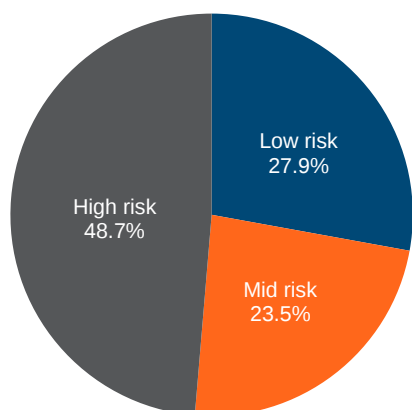
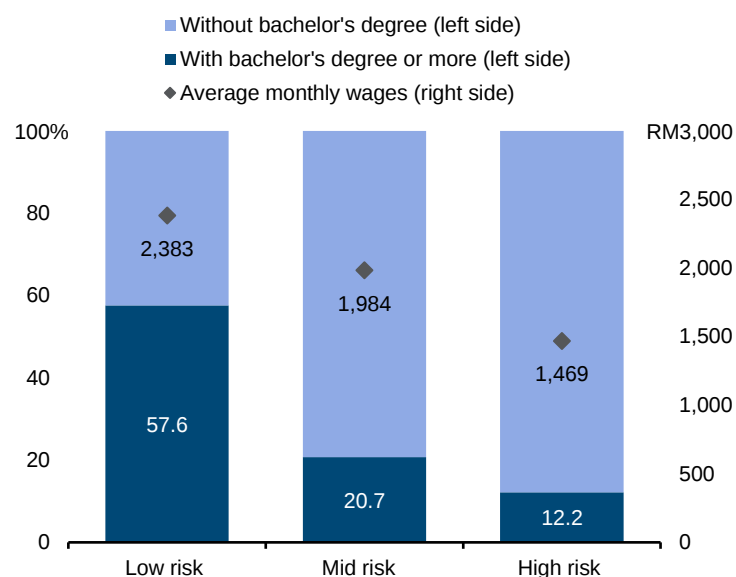


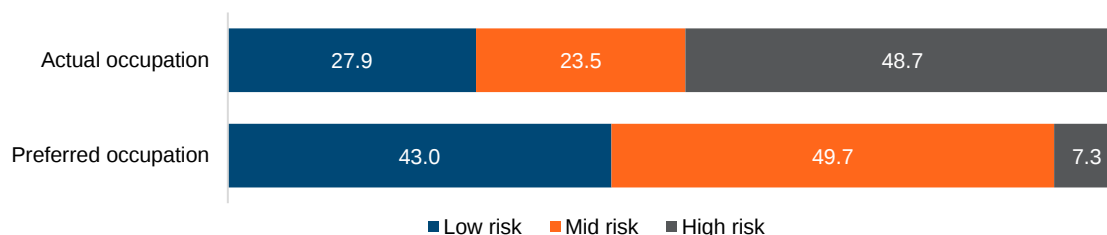
Figure 3.31: SWTS respondents' profile, by job's automation risk, educational attainment and average monthly wages, 2018



Note: Respondents refer to surveyed full-time employed persons aged 15 to 29.
Source: Dataset from KRI (2018b), methodology based on KRI (2017a), KRI calculations

In the SWTS, the respondents were also asked about their actual and preferred occupations. Contrary to the result for actual occupations, the young respondents' preferred occupations were overwhelmingly less susceptible to automation (Figure 3.32). Only 7.3% of preferred occupations were at high risk of automation, compared to 48.7% of actual occupations. This is not surprising considering that the majority of these respondents were tertiary educated and many were overqualified for their current positions¹¹⁸. This mismatch between employment reality and career aspirations is further explored in Box 3.1.

Figure 3.32: SWTS respondents' share, by actual and preferred job's automation risk, 2018



Note: Respondents refer to surveyed full-time employed persons aged 15 to 29.
Source: Dataset from KRI (2018b), methodology based on KRI (2017a), KRI calculations

¹¹⁸ See KRI (2018a)

Individuals in their 20s form the majority of internet and computer users¹¹⁹, having grown up in an era of a widespread adoption of digital technology, and hence comfortable and familiar with digital technologies. When asked whether the internet will bring more or less jobs, over 60% of SWTS respondents were optimistic that the internet would generate more job opportunities¹²⁰. Considering their technological optimism and willingness to adopt new technologies, the technological advances and increasing importance of the digital economy discussed in the previous section have the potential to both aggravate and alleviate the employment challenges faced by youth. Their optimism and willingness should be capitalised by enhancing their ability to seize potential new job opportunities. Efforts like #mydigitalmaker, launched in 2016 by the MDEC, with its early intervention approaches to groom and encourage future digital makers (instead of consumers), is a step in the right direction¹²¹.

Box 3.1: Youth's career aspirations and job realities

The transition from education to the labour market is increasingly challenging for youth. In Malaysia, despite low and stable headline unemployment rate (below 4.0% since 2000), the youth unemployment rate keeps increasing. Of the total 508,200 unemployed Malaysians in 2019, 79.1% of them were youth ages 15 to 29¹²². Since 2015, the unemployment rate among the youth ages 15 – 24 years old has consistently been above 10%¹²³.

Malaysia is not alone in grappling with youth unemployment as other countries are facing similar issues. The world's youth unemployment (ages 15 – 24) was projected to reach 13.7% by 2020, or 67.8 million young unemployed persons¹²⁴. Difficulties in the early phase of job search can have severe impacts on youth and result in low employability and hamper skill and knowledge acquisition required by the labour market¹²⁵.

This article outlines findings from KRI's School-to-Work Transition of Young Malaysians Report (SWTS) published in 2018¹²⁶. It discusses the disconnect between youth aspirations and job expectations; and labour market realities in Malaysia.

¹¹⁹ MCMC (2018)

¹²⁰ This is also consistent with the positive tone of reporting on the future of work in Malaysia, as well as the high share of the Malaysian population seeing ongoing technological developments as positive. For more details, see ILO (2019) and KRI (2018a)

¹²¹ See MDEC (n.d.b)

¹²² DOS (2020c)

¹²³ DOS (2020b)

¹²⁴ ILO (2020b)

¹²⁵ KRI (2018a)

¹²⁶ The SWTS was conducted at end 2017/early 2018 to collect information on youth education and their labour market situation. The responses were collected from 22,165 youths aged between 15 to 29 years old and 1,620 employees nationwide. Ibid.

Youth aspirations for life and jobs

Findings from this survey indicate that youths in different age groups all hoped for steady jobs with job security, work-life balance and interesting tasks. “High income” ranked fourth or fifth in the youth list of the most important job characteristics, hence challenging the popular claims that youths are “demanding” and have unrealistic job and salary expectations. Almost half of youths at different phases of life aspired to work in the public sector and for large international companies as they associate these two working places with job security and stability.

Youth aspirations and job realities: A disconnect

The SWTS report found youths are generally better off than their parents in terms of educational achievement, similar to the findings of KRI (2016). Better access to education has allowed youths to attain higher educational qualifications. However, the SWTS report pointed out several disconnects between youth aspirations and job realities.

Firstly, like Table 3.2, the industries that they were currently working in were often not the industry they prefer to work in. The sector with the highest concentration of youths is *wholesale & retail trade*, where 19.4% of youths were employed, compared to 8.7% who preferred to work in it. Meanwhile, the *civil/ uniform services* employed only 8.2% of youths, compared to 17.6% who preferred to work in this sector. The gap between youth aspirations and job realities are not unique for Malaysia¹²⁷, especially among tertiary-educated youth.

Table 3.2: Respondents’ share, by current and preferred subsector, 2018

Economic activity subsector	Current	Preferred
Wholesale & retail	19.4%	8.7
Accommodation and food & beverage service activities	12.1	7.6
Civil service/uniform services	8.2	17.6
Education	7.9	11.0
Health and social work	7.0	7.0
Manufacturing	6.8	4.5
Agriculture, fishing and forestry	6.0	3.5
Construction	4.4	5.5
Finance and insurance related	4.2	5.2
Information and communications	3.9	2.2
IT-related	3.6	6.0
Arts, entertainment and recreation	3.3	4.8
Utilities	2.8	1.6
Online business	2.6	6.7
Transportation and storage	2.3	1.8
Mining including petroleum and gas	1.1	2.3
Real estate	0.9	1.1
Other	3.4	2.9
Total	100.0	100.0

Note: Respondents refer to surveyed employed persons aged 15 to 29.

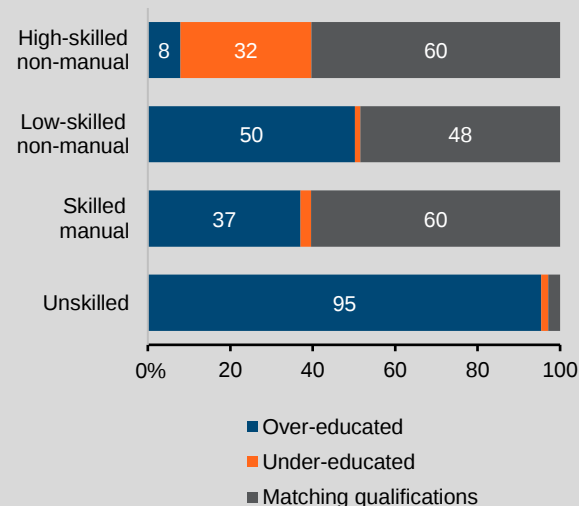
Source: KRI (2018a)

¹²⁷ Rogers, Chambers, and Percy (2020), OECD (2017)

Secondly, while improvement in educational attainment has increased the supply of educated and skilled employed persons, the SWTS report found many young employed persons to be “over-qualified” for their current jobs. About 95% of those working unskilled jobs and half of those in low skilled manual jobs has higher education levels than required by their jobs (Figure 3.33).

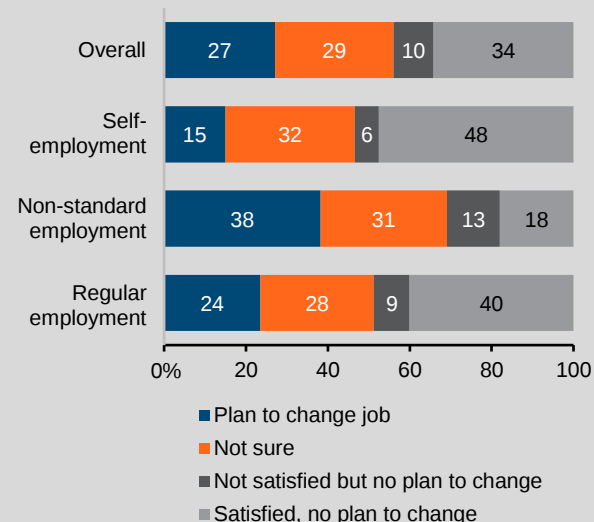
Thirdly, many young employed persons, especially those in temporary, part-time or casual work indicated that they wanted to change jobs (Figure 3.34). This scenario implied that youth were dissatisfied with their current jobs, with most of them being “over-qualified”. Most young employed persons planned to change jobs, mainly for better pay and job prospects.

Figure 3.33: Respondents’ share, by skill level and education, 2018



Note: Respondents refer to surveyed employed persons aged 15 to 29.
Source: KRI (2018a)

Figure 3.34: Respondents’ share, by current employment status and plan to change job, 2018

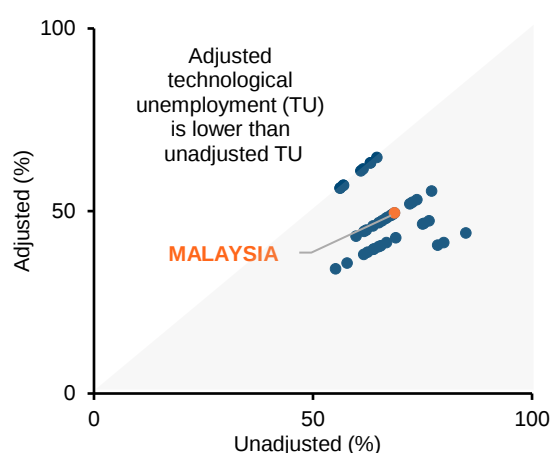


Three key caveats apply thus far. One, instead of trying to predict the exact number of jobs that will be lost and when, the aim is to illustrate the potential scale of technological unemployment. Two, we have focused on occupations, not tasks. As each occupation involves a combination of tasks, automation may complement existing occupations and/or can even generate new jobs. Three, the estimates are only based on the technical potential for automation and exclude other considerations that may hasten or halt the spread or depth of technological adoption. For instance, factors like access to cheap labour, skilled labour shortages and limited technological infrastructure may disincentivise firms from adopting labour-saving technologies.

The World Bank has attempted to address these limitations by adjusting expected effects of technological unemployment with country-level adoption lags and technological readiness. In Figure 3.35, this contextual consideration dampens the unadjusted expected effects. The share of computerised employment for Malaysia dropped from 67.8% to 48.8%. Nevertheless, this estimate is similar to the one we estimated earlier, both suggesting about half of all existing jobs in Malaysia are at risk of technological unemployment.

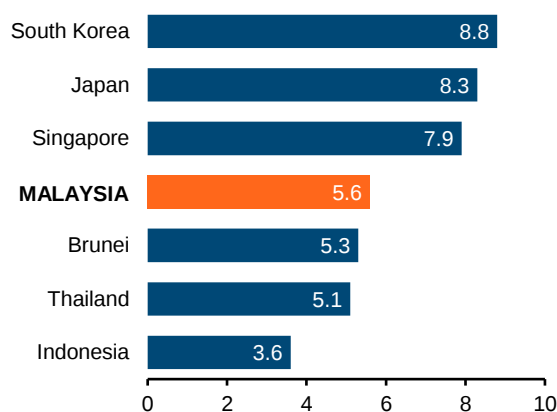
The lower adjusted impact by the World Bank (from 67.8% to 48.8%) is consistent with Malaysian international performance for ICT infrastructure. While Malaysia outperformed its neighbours like Brunei and Thailand, it still lags behind most developed countries (Figure 3.36). Since successful adoption of IR4 technologies requires excellent ICT infrastructure, this indicates that Malaysia requires more digital and physical investment to catch up with the economies like South Korea and Japan¹²⁸. Limited technological readiness could imply that the staggering impact of technological unemployment may well be overly pessimistic, but not keeping up with new technology may end up being costly.

Figure 3.35: Estimated employment share susceptible to automation, by selected developing country, latest available year



Note: The 2016 estimates by the World Bank were based on latest year data.
Source: World Bank (2016)

Figure 3.36: ICT Development Index, by selected country, 2015



Note: The ICT Development Index was generated by the International Telecommunication Union (ITU). It is based on three sub-indices (i.e., ICT access, use and skills) and ranges from 0 to 100. Higher values indicate better ICT development.
Source: World Bank (n.d.b)

To mitigate the negative impacts and reap the promised benefits of technological advances, countries have been urged to focus on (1) increasing the ability and speed of the economy to create new jobs, (2) responding to changes in skills demand, and (3) reforming the social protection to support dislocated workers¹²⁹. These suggestions are not only relevant to technological threats, but also other shocks like how the Covid-19 swept across the world leading to unprecedented supply and demand shocks.

¹²⁸ Malaysian performance in the ICT Development Index has improved from 56 in 2015 to 63 in 2017. Source: DOS (2019e)

¹²⁹ World Bank (2016)

3.3 A New Shock: Covid-19

Covid-19 was first discovered in Wuhan, China, at the end of December 2019. A month later, the World Health Organization declared it to be a Public Health Emergency of International Concern¹³⁰. Malaysia's confirmed its first case of Covid-19 in January 2020¹³¹. When the number of cases rose rapidly in March, the government announced a Movement Control Order (MCO) to give time to build the country's health system's capacity as part of the effort to contain the spread of the disease¹³². The MCO when it was first introduced included restriction of various activities with most workers made to work from home, except for those in essential sectors. In subsequent months, the restrictions were gradually lifted, and more businesses were allowed to operate again, although they are required to follow health-related guidelines to prevent the virus from spreading further¹³³.

3.3.1. Unemployment and labour underutilisation

The MCO was deemed necessary for public health reasons, yet it is not without economic costs. For employed persons, the most direct effect is labour underutilisation (work fewer hours or forced to take unpaid leave) or unemployment, as many businesses were forced to close temporarily during the MCO. A survey conducted by DOS in March 2020 found 16.2% of respondents had lost their jobs (Figure 3.37) and this was more common among the self-employed with 46.6% of the self-employed reported losing their jobs. The unemployment rate also rose above the stable 4% recorded in the past decade, to 5.0% in April 2020 and 5.3% in May 2020, implying more than 770,000 unemployed¹³⁴. Such increase in unemployment can be observed in other countries too (Figure 3.38). Private sector wage growth also moderated in the first quarter of 2020, as wages grew slower in manufacturing and services sectors¹³⁵.

The immediate concern with unemployment is loss of income experienced by the affected workers. Some were able to cushion the economic blow by utilising unemployment benefits from the Employment Insurance Scheme (EIS), although it covers only Malaysian contributing *employees*, not foreign workers and the self-employed. Cash transfers have also been distributed to households to ease the financial burdens of many families affected by the pandemic¹³⁶.

¹³⁰ WHO (2020)

¹³¹ Roser et al. (2020)

¹³² The MCO was implemented on 18 March 2020.

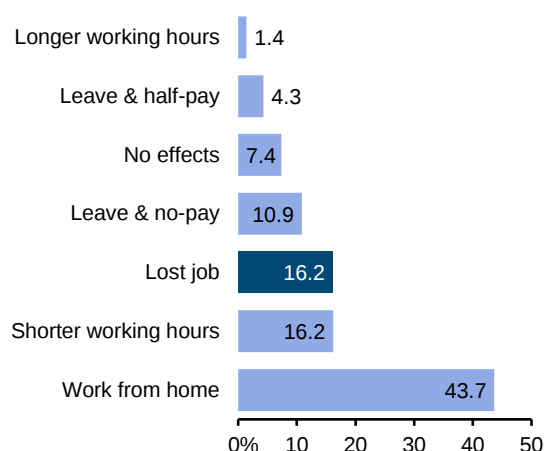
¹³³ MITI (2020)

¹³⁴ DOS (2020d) and DOS (2020e)

¹³⁵ BNM (2020)

¹³⁶ PMO (2020b)

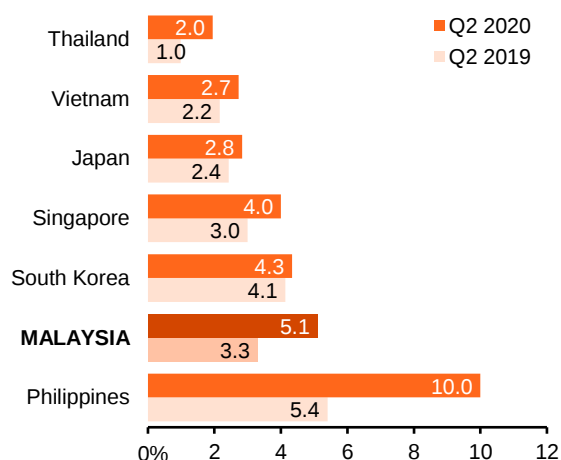
Figure 3.37: Effects of Covid-19, March 2020



Note: Percentages are out of total respondents who recorded the listed effects.

Source: DOS (2020h), KRI calculations

Figure 3.38: Unemployment rate, by selected country, Q2 2019 and Q2 2020



Note: The second quarterly ended in June, except for the Philippines (July).

Source: CEIC (n.d.)

However, the effects of unemployment go beyond income loss, often severely affecting psychological well-being too¹³⁷. Concerns centre on whether unemployment due to Covid-19 will turn into long-term unemployment if the economy does not recover fast enough. Long-term unemployment, in turn, affects in several ways: it erodes workers' skills and work networks, reducing their potential employability, productivity and future income; it reduces the quantity and quality of their consumption; it increases stress; and it increases the likelihood of workers exiting the labour market altogether, leading to the rise of "discouraged workers"¹³⁸.

Unemployment and labour underutilisation also call into question the adequacy of our social protection schemes. Standard workers, or *employees*, are the most protected during this time of crisis, while the self-employed remain vulnerable¹³⁹.

Reskilling has been suggested as a possible key priority in dealing with the effects of Covid-19 for work¹⁴⁰. Malaysia's own Covid-19 stimulus packages provided subsidies for courses to upskill workers¹⁴¹. MDEC has also collaborated with Coursera, an online learning platform, to provide free access to 3,800 courses for unemployed Malaysians¹⁴². These initiatives are expected to benefit many workers, although potential exclusion of those not contributing to HRDF, or workers facing digital exclusion may still exist. Moreover, improvement of the quality of labour supply only matters if there is going to be demand for these workers. Such questions concerning the ability of firms to create enough *decent jobs* utilising skilled workers remains.

¹³⁷ See Lim (2017) for the psychological impact of unemployment among Malaysian university graduates.

¹³⁸ See Nichols, Mitchell, and Lindner (2013)

¹³⁹ Adam (2020)

¹⁴⁰ Agrawal et al. (2020)

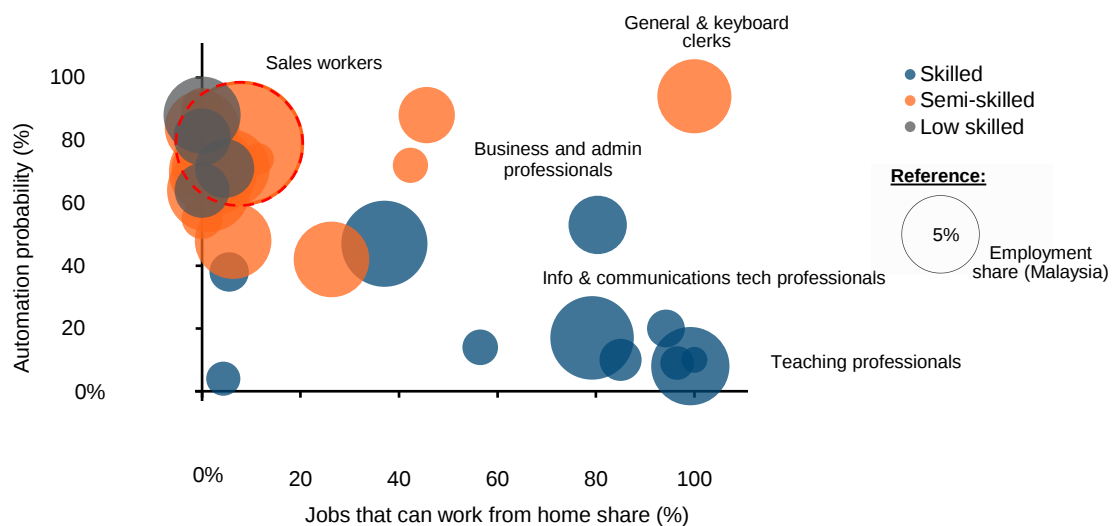
¹⁴¹ PMO (2020a) and HRDF (n.d.)

¹⁴² MDEC (n.d.a)

3.3.2. Increased risk of automation

Covid-19 could also increase the risk of automation as firms try to cut costs and manage supply chain disruptions, as well as respond to potentially changing consumer preferences for automated services as physical distancing precautions continues. Even prior to Covid-19, automatable jobs tend to be semi-skilled and low skilled. These jobs also tend to have lower teleworking capabilities, i.e., workers cannot simply work from home when physical distancing requirements are enforced (Figure 3.39). If movement restrictions have to be extended for a long period, we may risk the permanent loss of non-teleworkable semi-skilled jobs, further aggravating the job polarisation trend discussed in Section 3.2.2.

Figure 3.39: Automation probability versus jobs that can work from home share and Malaysia's employment share, by occupation



Note: Automation probability refers to computerisable probability estimated based on US 2013 employment data, jobs that can work from home share estimated based on US 2020 employment data (higher share means the job is more likely to survive Covid-19 as they can continue working from home when countries implement containment measures). Bubble sizes indicate Malaysia's share of employed persons in 2016.

Source: Data cited in KRI (2017a), KRI calculations based on Dingel and Neiman (2020)

While Covid-19 may accelerate some digitisation and automation, it does not mean jobs will be immediately automated, especially considering the very uneven readiness of firms to automate, as discussed in Section 3.2. Industrial robots are still more concentrated in high-technology manufacturing activities¹⁴³, and even among firms in the sector, investments in machineries are still limited.

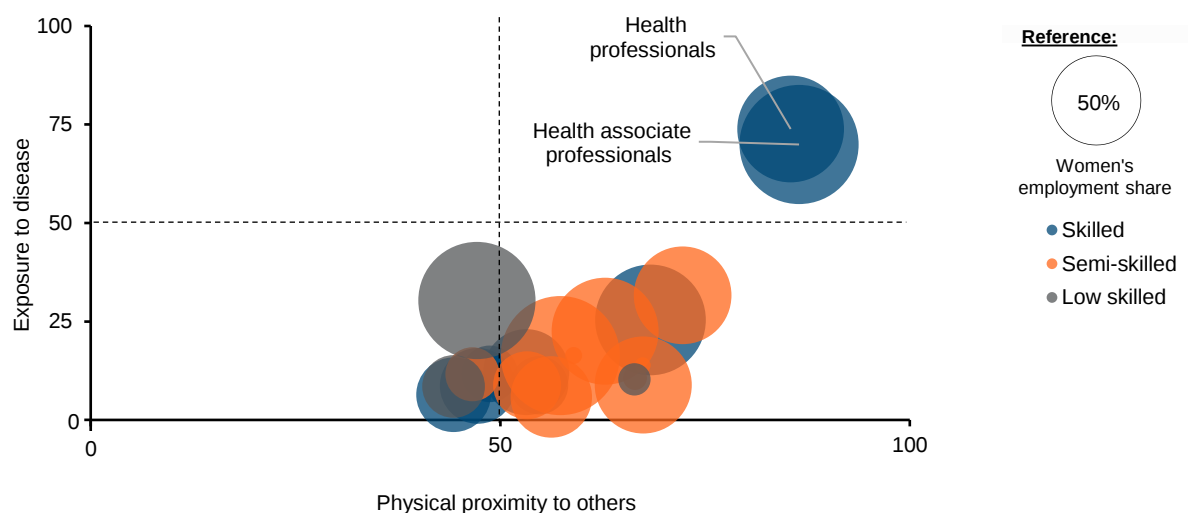
¹⁴³ See Figure 2 in Seric and Winkler (2020).

The pandemic instead provides a window of opportunity for policymakers to strategically manage the transition towards automation. On the firms' side, this crisis is a clear evidence on why digitalisation and automation matters, further supported by various government incentives provided for firms to digitalise and automate. However, the transition process for these firms should also be supported by investments to improve workers' skills so that they can operate the new technologies installed to improve productivity and business resilience. Simply put, we must ensure that workers complement technological advancements rather than simply being substituted by them¹⁴⁴.

3.3.3. Health and safety standards

Health-related employment risks typically focus on statistics of workplace accidents, which tend to focus on male-dominated sectors like construction. However, Covid-19 highlights another angle on how we think about occupational safety and health (OSH) and how it disproportionately affects women. During the pandemic, many healthcare workers were directly exposed to the Covid-19 virus. Jobs with high physical proximity to others (such as workers in a restaurant) will also be at risk as the virus spreads via close contact. These jobs typically employ more women than men (Figure 3.40), illustrating that women may face higher occupational risks that often go unnoticed when discussing OSH policies.

Figure 3.40: Average score on exposure to disease and physical proximity to others, Malaysia's women employment share, by occupation



Note: The original dataset calculated probabilities by 4-digit occupational categorisation, but these probabilities are averaged for 2-digit occupational categorisations. We warrant caution as the range of probabilities is large within each 2-digit occupational categories.

Source: Data cited in KRI (2017a), KRI calculations based on ONS (2020)

¹⁴⁴ Frey (2019)

While the government has released guidelines to ensure employees safety at the workplace¹⁴⁵, implementation will still require active monitoring. Considering the gendered nature of risks Covid-19 has on the workforce, policies and guidelines should also consider a more gender-sensitive approach.

Some new aspects of OSH risks ought to be considered as well; for instance, the prolonged use of certain personal protective equipment (PPE) may result in heat stress and dehydration, the health effects of increased use of cleaning and disinfecting chemicals, and the lack of suitable or comfortable infrastructure for those working from home¹⁴⁶. Moreover, the stress and other psychological changes induced by emergency situations such as the pandemic should not be underestimated. For those on the frontlines, this could be the result of having to work longer hours; while others may worry continuously about their job security. To manage the crisis and chart our way forward, coordinated information sharing on OSH is very important to ensure that workers, employers, the public and the government are on the same page¹⁴⁷. Without better coordination, lives will be unnecessarily at risk. Though not focusing specifically on the Covid-19 pandemic, Part III SOH2020 explores further the potential effect that employment and working conditions can have on health, including some discussion on the indirect health effects of Covid-19 on health of the Malaysian workforce.

¹⁴⁵ MOH (2020)

¹⁴⁶ ILO (2020c)

¹⁴⁷ ILO (2020a)

CONCLUSION

“Decent work is at the heart of the search for dignity for the individual, stability for the family and peace in the community”

Juan Somavia

CONCLUSION

This report began by reviewing the evolution of Malaysia's economic structure and its impact on employment at state level. In the late 1980s and the early 1990s, Malaysia experienced rapid industrialisation primarily driven by export-oriented industries. During this period, all states experienced impressive growth in the manufacturing employment. Agricultural employment contracted during the same period, yet it continued to be prominent over the years for Groups C (Sabah, Sarawak and Labuan) and D (Perlis, Kedah, Perak Kelantan and Pahang).

While national figures suggest deindustrialisation starting in the 2000s, the decline of manufacturing employment begun earlier in most states. Manufacturing remained dominant in Groups A (Kuala Lumpur, Selangor and Putrajaya) and B (Johor, Melaka, Negeri Sembilan, Pulau Pinang & Terengganu), though manufacturing employment share has increased for Group C in the last ten years. Nevertheless, most states exhibited larger decline in manufacturing output share relative to employment share, suggesting declining productivity or lessening manufacturing competitiveness. With lacklustre manufacturing growth, employment growth and opportunities have been mostly driven by services.

The transition from an industry-based to a service-based economy accelerated after the GFC. *Modern services* employment share has been concentrated in Group A, while the expansion of *other services* has been more equal across different state groups. However, the majority of other services employment tended to be in "traditional" services like *wholesale & retail, food & beverages* and *accommodation* with low productivity and low paying jobs with limited formal and standard employment being more prominent. Within the *other services*, essential "social services" important for society's well-being have also contracted in the past decade.

Economic productivity is heterogenous, with Group A charting higher concentration of *modern services* and *high-technology manufacturing*. The varying concentration of economic activities mirrors the uneven economic development and related employment patterns. Unsurprisingly, more economically developed states continue to fare better than the rest. These persistent regional disparities highlight the need to review uneven regional economic development and revisit related policies.

Employed persons in Groups A and B appear to have fared better according to many employment indicators. In a rapidly ageing society, states in Groups A and B continue to have higher labour participation rates (notably among women of prime working years, ages 24 to 54), lower unemployment rates, and higher shares of skilled jobs and educated employed persons relative to others. There is also a close association between better jobs and higher pay. It is not surprising then to see higher paid workers and high-income households concentrated in these states, particularly Group A. These patterns also reflect the composition of firms, with more larger firms operating in Groups A and B states.

By contrast, notwithstanding diminishing inter-state disparities, Groups C (Sabah, Sarawak and Labuan) and D (Perlis, Kedah, Perak Kelantan and Pahang) continued to chart lower labour participation rates, higher unemployment rates, and lower shares of skilled jobs and educated employed persons. As expected, individual wages and household incomes are lower in these two groups, with more SMEs that exhibit lower productivity levels. Labour market indicators also suggest that employed persons in Groups C and D are more likely to experience *decent work deficits* with as these state groups had higher incidence of skills mismatch and shares of vulnerable employment, as well as faster growth of non-standard jobs lacking formal social protection. As job creation continues to be a high priority rather than job quality, jobs with *decent work deficits* could be more likely to be found in these states, thereby contributing to a vicious cycle of poor jobs and poor economic performance.

Instead of minimising short-term costs, profitability could be enhanced and sustained through productivity improvement, achieved by promoting safer jobs with better employment arrangement. This commitment to *decent work* can coax businesses to move up the value chain, triggering a virtuous cycle of higher productivity with better jobs and wages. In turn, employed persons with better jobs have households less vulnerable to shocks and stress. As economic shocks become more common, building resilient community is more important than ever. Some of these external shocks have shaped the past, the present and will likely continue shaping future labour market landscapes.

The final section considered the development of capital and technology their labour market impacts. The capital accumulation trends were consistent with our structural and employment economic changes. Investment grew fastest during the 1990s industrialisation period and has moderated with the shift to services. Malaysian investment has not recovered its pre-AFC pace, recorded during 1990 to 1997. While intangible assets like R&D promise to provide new sources of growth, available indicators suggest that very little R&D investment in the country.

Rapid changes in technology have affected the way we work, both positively and negatively. In the short term, the booming e-commerce activities may have facilitated the recent growth of self-employment among women and youth. While self-employment provides income generating opportunities with greater autonomy and flexibility, it typically involves income insecurity and inadequate social protection relative to paid employment, especially in large firms.

Skilled employed persons are more likely to benefit from technological advancement while semi-skilled jobs—which provided the most employment—are more vulnerable to automation. However, the technological unemployment (i.e., labour replaced by technology) might not be immediate. This delay in widespread technological adoption provides an opportunity for policymakers to support labour-enhancing technologies, strengthen the safety net for displaced employed persons and prepare people for changing labour market conditions.

Finally, while all employed persons have been affected by the Covid-19 pandemic, the impacts have been very uneven. Some employed persons are bound to experience long-term unemployment with detrimental economic and social consequences. Some occupations employing more women than men involve greater exposure to infection, providing a gendered nuance to the effects of Covid-19 on occupational safety and health.

APPENDICES & REFERENCES

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DEINDUSTRIALISATION IN DIFFERENT STATES IN MALAYSIA

According to Rodrik (2015), premature deindustrialisation refers to countries reaching peak manufacturing value added and employment shares sooner and at much lower income levels compared to earlier industrialised countries. While Rodrik (2015) found Asian countries generally insulated from premature deindustrialisation, BNM (2017) found that Malaysia had experienced premature deindustrialisation when comparing the decline in manufacturing output (value added) share compared to its employment share.

In Rodrik (2015), manufacturing employment and output shares had an inverse-U relationship with GDP per capita. Estimation in specification (1) below will result in $\widehat{\beta}_3 > 0$ and $\widehat{\beta}_4 > 0$

$$man_{it} = \alpha + \beta_1 lnpop_{it} + \beta_2 (lnpop_{it})^2 + \beta_3 lny_{it} + \beta_4 (lny_{it})^2 + \sum_i \gamma_i D_i + \sum_T \phi_T PER_T + \varepsilon_{it} \quad (1)$$

Note: man_{it} is manufacturing outcomes (value-added and employment), $lnpop_{it}$ is logged population, lny_{it} is logged GDP per capita, D_i are other dummies and PER_T are period dummies (1960s, 1970s, 1980s, 1990s, 2000s)

We adapted (1) to study the deindustrialisation of different states in Malaysia using variables listed in Table A.1. However, estimates of GDP per capita by state were only available from 2005 but as discussed in Section 1, most states' peak manufacturing shares occurred before 2005. For earlier years, we used GDP per capita estimates from the Third Outline Prospective Plan, which has GDP per capita information for 1990 and 2000. Given these limitations, interpretations of these findings should be treated as tentative.

Table A1: Data description and source

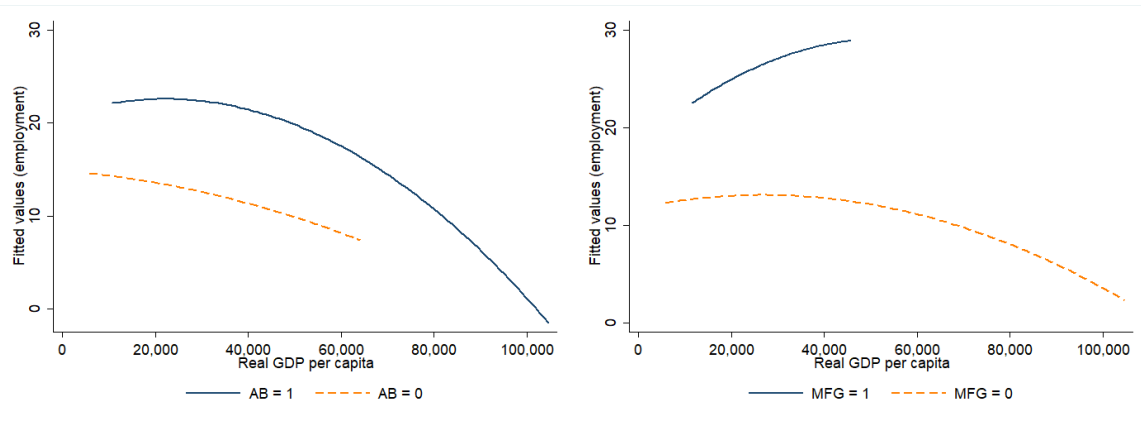
Variable	Description	Source
Log GDP per capita	Log of real GDP per capita (in 2010 prices) for 1990, 2000 and 2005 to 2018.	EPU (2001), DOS (via CEIC)
Log population	Log of population for 1990, 2000 and 2005 to 2018.	DOS (via CEIC)
Manufacturing employment share	Manufacturing employment per total employment in state, for 1990, 2000 and 2005 to 2018.	DOS (various years.b)
Manufacturing GDP share	Manufacturing GDP per total GDP, from 2008 to 2018. GDP in constant 2010 prices.	DOS (via CEIC)

Note: Exclude Putrajaya due to the unavailability of GDP data from 2000 onwards. For 1990 and 2000 data, GDP per capita data in Selangor includes Putrajaya, while Sabah includes Labuan.

First, we estimate a baseline relationship for Malaysia, using observations from 1975 and 2018 (n=44). Manufacturing value added share peaked when GDP per capita was around RM30,500, while manufacturing employment peaked when GDP per capita was RM25,000. As in Rodrik (2015), manufacturing employment peaked earlier than manufacturing value added.

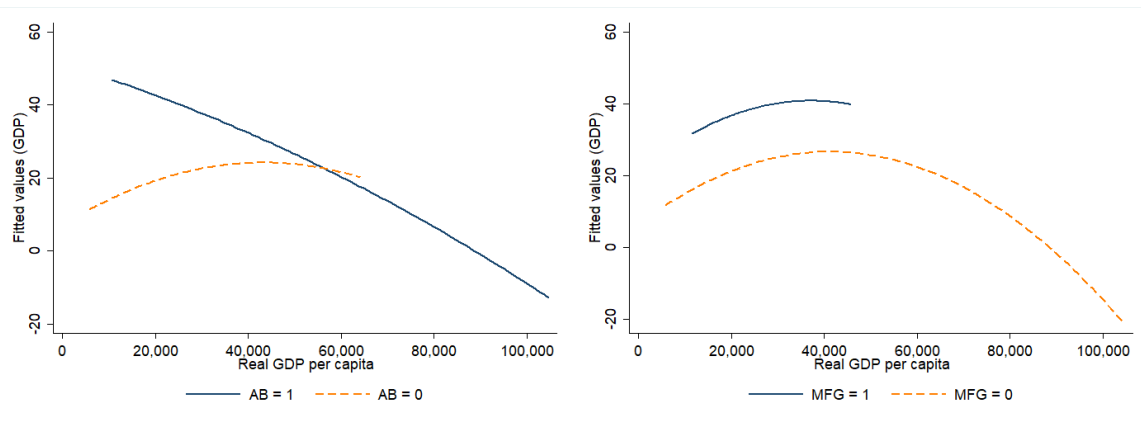
Second, we estimate (1) and obtain its predicted values. Figure 1.A and Figure 1.B show that peak manufacturing employment and GDP shares coincided with higher GDP per capita for states in more “developed” groups of A and B (indicated by dummy $AB=1$), and states where manufacturing employment shares were higher than 20% (indicated by dummy $MFG=1$). To some extent, these observations suggest premature deindustrialisation at the state level, where manufacturing activities in “developing” states reached their peak at lower income levels compared to more “developed” states.

Figure A1: Predicted manufacturing employment share and real GDP per capita, by state category



Note: $AB = 1$ refers to Kuala Lumpur, Selangor, Johor, Melaka, Negeri Sembilan, Pulau Pinang and Terengganu; $AB = 0$ refers to the remaining states. $MFG = 1$ refers to states with manufacturing employment > 20%; $MFG = 0$ refers to states with manufacturing employment less than 20%.

Figure A2: Predicted manufacturing GDP share and real GDP per capita, by state category



Note: $AB = 1$ refers to Kuala Lumpur, Selangor, Johor, Melaka, Negeri Sembilan, Pulau Pinang and Terengganu; $AB = 0$ refers to the remaining states. $MFG = 1$ refers to states with manufacturing employment > 20%; $MFG = 0$ refers to states with manufacturing employment less than 20%.

Third, we tabulate the estimates of equation (1) using OLS with states' fixed effects, following Rodrik (2015) in Table A.2. The hypothesised inverse-U relationship between income and manufacturing employment share and GDP share is shown by the significant positive estimate on logged GDP per capita and significant negative of squared logged GDP per capita. We also include period dummies in our estimation, for years between 2005 and 2009 (*yr2005_2009*), and after 2009 (*yr2010_2018*). Significant negative estimates show that manufacturing employment after 2005 was significantly lower compared to before 2005 (Table A.2-ii), and manufacturing GDP share in 2010 – 2018 was significantly lower than in 2005 – 2009 (Table A.2-iv).

Insignificant negative estimates for the interaction term between *yr2005_2009* and *AB* ($(yr2005_2009=1)*(AB=1)$) in Table A2-ii suggest that the decline of manufacturing employment shares seemed to be similar across states, regardless of state group. In the past decade, however, manufacturing employment and GDP shares in Groups A and B states were *lower* compared to other states even after controlling for their population and their development level (Table A.2-ii and Table A.2-v). This finding is not directly obvious when comparing unconditional summary statistics, where average shares of manufacturing employment and GDP in Groups A and B were higher than other states.

Meanwhile, the estimates in Table A.2-iii show that the decline of manufacturing employment was more modest among manufacturing states during 2005 – 2009 compared to non-manufacturing states, but not significantly different in the years after 2009. In fact, among manufacturing states, Table A.2-vi shows that manufacturing GDP shares after 2009 also declined much more for these manufacturing states. This indicate the loss of manufacturing competitiveness (output decline is greater than employment decline) was more severe among manufacturing states.

Table A2: Regression results (OLS with fixed state effects), 1990 – 2018

	Manufacturing employment			Manufacturing GDP share		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
ln(population)	-0.855 (1.888)	0.624 (2.040)	-0.873 (2.077)	-6.945** (2.957)	-1.362 (2.606)	-4.862* (2.714)
ln(population) ²	0.110 (0.558)	0.0191 (0.592)	0.256 (0.596)	-0.238 (0.903)	0.903 (0.775)	0.331 (0.862)
ln(r.gdp.cap)	57.49*** (16.52)	43.20** (18.83)	59.04*** (16.18)	40.88* (22.46)	-15.63 (26.23)	36.66* (19.94)
ln(r.gdp.cap) ²	-2.773*** (0.801)	-2.087** (0.898)	-2.846*** (0.780)	-2.191** (1.083)	0.413 (1.261)	-2.031** (0.967)
<i>yr2005_2009</i> =1	-3.466*** (0.729)	-2.473*** (0.947)	-4.250*** (0.767)			
<i>yr2010_2018</i> =1	-4.963*** (0.911)	-3.819*** (1.183)	-5.203*** (0.946)	-3.291*** (0.548)	-1.103* (0.664)	-2.460*** (0.542)
(<i>yr2005_2009</i> =1)*(AB=1)		-2.033 (1.345)				
(<i>yr2010_2018</i> =1)*(AB=1)		-2.454* (1.417)			-4.034*** (0.842)	
(<i>yr2005_2009</i> =1)*(MFG=1)			1.913*** (0.649)			
(<i>yr2010_2018</i> =1)*(MFG=1)			0.393 (0.678)			-2.860*** (0.693)
Constant	-265.1*** (85.30)	-191.4* (98.31)	-273.9*** (83.87)	-146.1 (116.2)	151.3 (136.3)	-121.9 (102.7)
Observations	238	238	238	210	210	210
R-squared	0.951	0.953	0.954	0.976	0.979	0.978
State FE	Yes					

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

ECONOMIC STRUCTURE AND INCOME OUTCOMES

Income is an important indicator of labour market outcomes. This technical note seeks to establish the association between the economic structure of a state, defined by sectoral employment shares, and income levels. Based on the earlier analysis in Section 2.5, we expect that *modern services* (Table B.2) will have the largest positive association with income, an indication that this sector is a significant driver of between-states income divergences.

We estimate the following regression for each state i and year t :

$$\ln(\text{income})_{it} = \alpha + \beta_1 \text{mfg}_{it} + \beta_2 \text{mod.svc}_{it} + \beta_3 \text{oth.svc}_{it} + \sum_i \gamma_i D_i + \Pi_k(X_{kit}) + \varepsilon_{it} \quad (2)$$

income_{it} are income-related outcome variables; mfg_{it} , mod.svc_{it} and oth.svc_{it} are employment shares in manufacturing, modern services and other services, respectively; $\Pi_k(X_{kit})$ are other controls.

Seven income-related outcome variables were used to identify association on income levels (log of mean and median salaries, and mean and median household income), income dispersion (percentage difference between mean and median salaries and household income) and income inequality (Gini coefficient).

The main independent variables of interest are mfg_{it} , mod.svc_{it} and oth.svc_{it} which are state i shares of manufacturing, *modern services* and *other services* employment at time t respectively, to proxy for the relative importance of these sectors in the state. From this simple OLS regression, the estimated β_1 , β_2 and β_3 then show the association between employment structure and income outcomes for Malaysian states. Controls included in equation (2) are the state's share of skilled employed persons and labour force participation rates (LFPR). In the former, we attempt to control for the quality of jobs and the growth of the within-state workforce for the latter. Table B.1 lists the description of variables and its sources, Table B.2 describes the categorisation of services subsectors.

Table B1: Data description and source

Variables	Description	Source
Log salaries	Real mean and median salaries for citizen employees, between 2010 and 2018 (in 2010 prices)	DOS (2020i)
Log household income	Real mean household income between 1989 and 2019, real median household income between 1996 and 2019 (in 2010 prices)	DOS (various years.a)
Income ratio	Ratio of mean to median for wage and household income	KRI calculations
Gini	Gini coefficient	DOS (various years.a)
mfg, mod.svc, oth.svc	Employment shares in manufacturing, modern services and other services	DOS (2020b), KRI calculations
skilled	Employment share of skilled employed persons	DOS (2020b), KRI calculations
LFPR	Labour force participation rates	DOS (2020b)

Note: Household income data are not annual but wages data are.

Table B2: Modern services categorisation

Classification	Modern	Others
1989 – 1997 Malaysia Industrial Classification 1972	Finance, insurance, real estate and business services	- Electricity, gas and water - Transport, storage and communications - Community, social and personal services
1999 – 2007 Malaysia Standard Industrial Classification 2000	- Financial intermediation - Real estate, renting and business activities	- Electricity, gas and water supply - Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods - Hotels and restaurants - Transport, storage and communications - Public administration and defence; compulsory social security - Education - Health and social work - Other community, social and personal service activities - Private households with employed persons
After 2009 Malaysia Industrial Classification 2008	- Information and communication - Financial and insurance/takaful activities - Real estate activities - Professional, scientific and technical activities	- Electricity, gas, steam and air conditioning supply - Water supply; sewerage, waste management and remediation activities - Wholesale and retail trade, repair of motor vehicles and motorcycles - Transportation and storage - Accommodation and food service activities - Administrative and support service activities - Public administration and defence; compulsory social security - Education - Human health and social work activities - Arts, entertainment and recreation - Others service activities - Activities of households as employers

Source: Adapted from Ng, Tan, and Tan (2018), Eichengreen and Gupta (2006), ClaKhong and Jomo (2010)

First, we estimate equation (2) using **wages outcomes**, tabulated in Table B.3. All else constant, a 1 percentage point rise in *modern services* is associated with 1.4% and 1.0% higher median and mean salaries, and it is relatively smaller and even insignificant for other sectors (Table B.3-i and Table B.3-ii). However, larger shares of employment in *manufacturing* and *other services* were significantly associated with reduction in wage dispersion in the past decade (Table B.3-iii). Moreover, estimates suggest the positive and significant association between state's share of skilled employment on wage levels, although the "premium" is not as high as having larger shares of *modern services* employment (Table B.3-i and Table B.3-ii). Higher estimates for LFPR also show that wage levels were likely the result of larger size of the workforce (all columns Table B.3).

Second, we estimate equation (2) using **household income outcomes**, tabulated in Table B.4. All else constant, household income levels were significantly and positively associated with larger employment shares in all sectors. However, the “premium” was four times higher for *modern services* (~4%) compared to *manufacturing* and *other services* (~1%) (Table B.4-i and Table B.4-ii). Larger *manufacturing* employment shares were significantly associated with the reduction of **household income dispersion** and **inequality outcomes**, while larger *modern services* employment was positively associated with higher income inequality (Table B.4-iii and Table B.4-iv). We also include the estimates of using the fixed and random effects in Table B.4-v to Table B.4-viii. Controlling for state-specific characteristics, only employment shares in *manufacturing* was positively associated with higher household income levels (Table B.4-v and Table B.4-vi). The random effect estimates also showed that the *manufacturing* employment share has a negative relationship with income disparity (Table B.4-vii), but insignificant to changes in the value of Gini coefficients (Table B.4-viii). This illustrates that there might be other state-specific variables that could play a larger role in determining the household income and inequality.

Third, we separately estimate equation (2) based on different time periods, tabulated in Table B.5, as data for household income stretch longer time periods. Across all sectors, the association between employment shares and **household income levels** were the largest during the high industrialisation period i.e. Period 1, 1989 – 1997 (Table B.5-i, Table B.5-iv, Table B.5-vii, Table B.5-x). The magnitude of the estimate for *manufacturing* sector declined at the start of the deindustrialisation i.e. Period 2, 1999 – 2007 (Table B.5-ii, Table B.5-v, Table B.5-viii, Table B.5-xi) but increased when deindustrialisation moderated i.e. Period 3, 2009 – 2019 (Table B.5-iii, Table B.5-vi, Table B.5-xi, Table B.5-xiii). On the other hand, the “premium” associated to *modern services* remained relatively similar during Period 2 and Period 3, indicated by significant and similar estimates on *share.mod.svc* in Table B.5-ii, Table B.5-iii, Table B.5-v and Table B.5-vi. Moreover, positive and significant association between household income and sectoral share of *other services* was only found in Period 3 (Table B.5-iii and Table B.5-vi). The role of *manufacturing* employment in reducing income disparity also increased over time—as observed from the increasing magnitude of the estimates on *share.mfg* variable in Table B.5-vii to Table B.5-xii. In the past decade, *other services* played this role, while estimates on *modern services* were not significant (Table B.5-vii to Table B.5-xii).

These estimates illustrate why sector-based discussion on employment is relevant when discussing heterogeneity in wage and household income outcomes. *Modern services*, typically associated with high-income economic activities, add some premium to state-level wages. However, as noted in Section 1, this economic activity is concentrated in some states only. The largest employer in the country, *other services*, only have significant and positive association with household outcomes in the last decade. While *manufacturing* and *other services* outside the *modern services* subsectors did not produce the same “premium” to state wages, they appear to be important sectors that reduces wage dispersion.

Table B3: Regression results for real wages (OLS with state fixed effects), 2010 – 2018

Outcome: Wages, 2010 – 2018	Median (log)	Mean (log)	% difference between mean and median
	(i)	(ii)	(iii)
share.mfg	0.004*** (0.001)	-0.001 (0.001)	-0.748*** (0.136)
share.mod.svc	0.014*** (0.002)	0.010*** (0.002)	-0.510 (0.315)
share.oth.svc	0.006*** (0.002)	0.002* (0.001)	-0.526*** (0.193)
share.skilled	0.007*** (0.002)	0.009*** (0.002)	0.214 (0.250)
lfpr	0.017*** (0.002)	0.009*** (0.001)	-1.060*** (0.218)
constant	5.489*** (0.162)	6.530*** (0.095)	138.521*** (17.221)
Observations	143	143	143
R-squared	0.884	0.935	0.430
Year FE		Yes	

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Inclusion of year FE due to failure to reject the joint insignificance of year dummies. We also re-estimated (2) using fixed effects, but all estimates became insignificant except for some year dummies.

Table B4: Regression results for real household income (OLS, fixed and random effects), 1989 – 2019

Outcome: Household income, 1989 - 2019	Median (log)	Mean (log)	% difference between mean and median	Gini	Median	Mean	% difference between mean and median	Gini
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
share.mfg	0.012*** (0.001)	0.010*** (0.001)	-0.441*** (0.076)	-0.102*** (0.023)	0.015** (0.006)	0.006* (0.003)	-0.296** (0.149)	-0.056 (0.046)
share.mod.svc	0.043*** (0.004)	0.049*** (0.004)	0.350 (0.278)	0.287*** (0.103)	0.010 (0.010)	0.011 (0.007)	0.208 (0.352)	0.070 (0.176)
share.nonmod.svc	0.010*** (0.003)	0.011*** (0.002)	-0.031 (0.148)	-0.001 (0.048)	0.009 (0.005)	0.007 (0.004)	0.269 (0.200)	0.050 (0.062)
share.skilled	-0.002 (0.004)	-0.006** (0.003)	-0.223 (0.207)	-0.190*** (0.065)	-0.002 (0.003)	0.004 (0.005)	-0.299 (0.238)	-0.098 (0.069)
lfpr	0.027*** (0.003)	0.032*** (0.002)	0.442** (0.189)	0.150** (0.068)	-0.003 (0.006)	0.002 (0.007)	0.131 (0.274)	0.058 (0.106)
Constant	4.885*** (0.261)	4.794*** (0.188)	20.535 (15.915)	38.196*** (5.833)	6.981*** (0.501)	7.044*** (0.583)	25.187 (20.764)	40.922*** (8.080)
Observations	148	204	148	204	148	204	148	204
R-squared	0.922	0.934	0.435	0.490	0.936	0.952	0.3629	0.4457
Model	OLS	OLS	OLS	OLS	FE	FE	RE	RE

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All include year FE due to failure to reject the joint insignificance of year dummies. Reported estimates from FE and random effects (RE) depends on the results of Hausmann test for each regression, depending on their outcome variables. R-squared for RE refers to overall R-squared.

Table B5: Regression results for household income (OLS), by selected period

Outcome: Household income, 1989 - 2019	Median			Mean			% difference between mean and median			Gini		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)
Period	Period 1	Period 2	Period 3	Period 1	Period 2	Period 3	Period 1	Period 2	Period 3	Period 1	Period 2	Period 3
share.mfg	0.014*** (0.003)	0.009*** (0.002)	0.013*** (0.003)	0.008*** (0.002)	0.004** (0.002)	0.009*** (0.003)	-0.506*** (0.145)	-0.614*** (0.101)	-0.613*** (0.157)	-0.059 (0.046)	-0.159*** (0.041)	-0.223*** (0.059)
share.mod.svc	0.098*** (0.023)	0.044*** (0.009)	0.042*** (0.008)	0.079*** (0.015)	0.042*** (0.008)	0.040*** (0.007)	-0.877 (0.644)	-0.281 (0.465)	-0.332 (0.497)	-0.507* (0.273)	-0.255 (0.202)	-0.035 (0.176)
share.nonmod.svc	-0.003 (0.012)	-0.003 (0.006)	0.022*** (0.004)	-0.023*** (0.006)	-0.004 (0.006)	0.018*** (0.004)	-0.142 (0.459)	-0.143 (0.349)	-0.514** (0.247)	0.169 (0.115)	0.071 (0.152)	-0.298*** (0.093)
share.skilled	-0.017 (0.024)	0.011** (0.004)	-0.013** (0.005)	0.038*** (0.006)	0.013*** (0.004)	-0.009* (0.005)	1.325* (0.751)	0.252 (0.190)	0.513* (0.300)	0.196 (0.160)	0.112 (0.073)	0.179 (0.114)
lfpr	0.022** (0.008)	0.019*** (0.006)	0.038*** (0.006)	0.009 (0.008)	0.025*** (0.006)	0.035*** (0.005)	1.022** (0.447)	0.841** (0.415)	-0.366 (0.235)	0.451*** (0.129)	0.413** (0.165)	-0.197* (0.101)
Constant	5.794*** (0.831)	6.001*** (0.626)	4.318*** (0.489)	7.270*** (0.714)	6.040*** (0.584)	4.972*** (0.416)	-24.210 (42.688)	-0.305 (39.080)	83.075*** (20.014)	6.011 (12.472)	13.971 (16.396)	67.226*** (8.146)
Observations	28	57	63	56	57	63	28	57	63	56	57	63
R-squared	0.904	0.874	0.792	0.850	0.892	0.826	0.610	0.455	0.247	0.231	0.339	0.341

Note: Period 1 refers to 1989 – 1997, Period 2 refers to 1999 – 2007, Period 3 refers to 2009 – 2019. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All estimates used OLS without year FE, as regression was by different periods.

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