ASSESSING LABOUR MARKET AND SUPPLY CHAINS DISRUPTIONS DURING COVID-19 IN MALAYSIA

By

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master Science

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Chair   : Muhammad Daaniyall Abd Rahman, PhD
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The unprecedented global outbreak of COVID-19 has triggered severe impacts on the economy in Malaysia. Unlike previous crises, the COVID-19 crisis has induced disruption on both the supply and demand sides. The economic fallout due to COVID-19 has increased unemployment rates in the labour market. This labour market disruption has translated into a rise in the loss of employment. The measures taken in curbing the spread of the COVID-19 pandemic have also significantly reduced the operating capacity of the businesses. This reduction in operating capacity has created a massive disruption in the supply chain. The disruption on both sides of the economy calls for an economy-wide assessment of the impacts of COVID-19 in Malaysia.

Thus, the first objective of this work is to investigate the impacts of the labour market and supply chain disruption on the economy. The prolonged implementation of non-pharmaceutical interventions (NPI) that involve all sectors of the economy incurred high losses to the economy. In the future, sectors such as Agriculture and Mining and Quarrying that play a significant role in the supply chain should be prioritised and excluded from the measures. Hence, we have undertaken an analysis to determine the key sectors of the labour market and production. The determination of key sectors also provides information on the speed at which the impacts of disruption propagate from one sector to another.

In achieving the first objective, the extended input-output modelling technique is utilised. This modelling technique is considered novel in that the model extended to integrate the real-time administrative data, Loss of Employment (LOE). The second objective is fulfilled by using the average propagation length (APL)

technique. The APL technique assesses the forward and backward linkages of an economic sector and is built on the standard Leontief input-output matrix.

The impacts of LOE due to the outbreak of COVID-19 on the economy are relatively small but the impacts of COVID-19 are significant when taking into consideration both the LOE and supply chain shocks. In the determination of key sectors, labour intensity plays a significant role. Visualisation of the production chain shows that the Manufacturing sector dominates the supply chain. Policy makers must identify the key sectors in the economy that should be excluded or lifted from the implementation of non-pharmaceutical interventions (NPIs). The current policy regarding the closure of the economy due to COVID-19 pandemic formulated by the Malaysian National Security Council (NSC) is inclined towards considering the health crisis impact over the economic crisis. Therefore, it is time for policymakers to consider this modelling as part of a supporting tool in evidence-based analysis to facilitate decision-making.

**MENILAI GANGGUAN PASARAN BURUH DAN RANTAIAN BEKALAN
AKIBAT COVID-19 DI MALAYSIA**

Oleh

HEIZLYN AMYNEINA BINTI HAMZAH

Disember 2022

Wabak global COVID-19 yang belum pernah berlaku sebelum ini mencetuskan kesan teruk kepada ekonomi di Malaysia. Tidak seperti krisis sebelumnya, krisis COVID-19 menyebabkan gangguan pada kedua-dua bahagian penawaran dan permintaan. Kejatuhan ekonomi akibat COVID-19 telah mengakibatkan peningkatan jumlah kehilangan pekerjaan dalam pasaran buruh. Kejatuhan pasaran buruh telah diterjemahkan kepada peningkatan dalam kehilangan pekerjaan. Langkah-langkah yang diambil dalam membendung penularan wabak COVID-19 juga telah mengurangkan kapasiti operasi perniagaan dengan ketara. Pengurangan dalam kapasiti operasi ini telah menyebabkan gangguan besar-besaran pada rantaian bekalan. Gangguan di kedua-dua belah ekonomi memerlukan penilaian keseluruhan ekonomi terhadap kesan COVID-19 di Malaysia.

Oleh itu, objektif pertama bagi kajian ini adalah untuk mengenalpasti kesan pasaran buruh dan gangguan rantaian bekalan terhadap ekonomi. Pelaksanaan berpanjangan intervensi bukan farmaseutikal (NPI) yang melibatkan semua sektor dalam ekonomi menyebabkan kerugian yang tinggi kepada ekonomi. Pada masa hadapan, sektor seperti Pertanian dan Perlombongan dan Pengkuarian yang memainkan peranan penting dalam rantaian bekalan harus diberi keutamaan dan dikecualikan daripada langkah-langkah tersebut. Oleh itu, kami menjalankan analisis untuk menentukan sektor utama dalam pasaran buruh dan pengeluaran. Sektor-sektor utama penentuan juga menyediakan maklumat tentang kelajuan kesan gangguan untuk disebarkan dari sektor ke sektor lain.

Dalam mencapai objektif pertama, teknik pemodelan input-output lanjutan digunakan. Teknik pemodelan ini dianggap novel di mana model diperluaskan untuk menyepadukan data pentadbiran masa nyata, Kehilangan Pekerjaan (LOE). Objektif kedua dipenuhi dengan menggunakan teknik purata propagasi panjang. Matriks input-output standard Leontief merupakan asas kepada APL yang menilai rantaian bekalan ke hadapan dan belakang sesebuah sektor ekonomi.

Kesan kehilangan pekerjaan akibat wabak COVID-19 kepada ekonomi adalah agak kecil tetapi kesan COVID-19 besar apabila mengambil kira kedua-dua gangguan kehilangan pekerjaan dan rantaian bekalan. Dalam penentuan sektor utama, intensiti buruh memainkan peranan penting untuk menentukan sektor utama. Visualisasi rantaian pengeluaran menunjukkan bahawa sektor Pembuatan mendominasi rantaian bekalan. Pembuat dasar mesti mengenal pasti sektor utama dalam ekonomi yang harus dikecualikan atau ditarik balik daripada pelaksanaan intervensi bukan farmaseutikal. Dasar berhubung penutupan ekonomi akibat pandemik COVID-19 yang dibuat oleh Majlis Keselamatan Negara Malaysia (MKN) dan cenderung untuk mempertimbangkan kesan krisis kesihatan lebih daripada krisis ekonomi. Oleh itu, sudah tiba masanya untuk penggubal dasar untuk mempertimbangkan pemodelan ini sebagai sebahagian daripada alat sokongan dalam analisis berasaskan bukti untuk memudahkan membuat keputusan.

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LIST OF ABBREVIATIONS

APL	Average Propagation Length
ARDL	Autoregressive Distributed Lag
ARIO	Adaptive Regional Input-Output
BDI	Basic Dynamic Inequalities
CGE	Computable General Equilibrium
CMCO	Conditional Movement Control Order
COVID-19	Coronavirus-2019
CPS	Current Population Survey
DOSM	Department of Statistics Malaysia
EIS	Employment Insurance System
GDP	Gross Domestic Product
IIM	Inoperability Input-Output Model
IO	Input-Output
LOE	Loss of Employment
MCO	Movement Control Order
MPC	Marginal propensity to consume
NPI	Non-pharmaceutical interventions
PPML	Poisson pseudo maximum likelihood
Q1	First quarter
Q2	Second quarter
Q3	Third quarter
Q4	Fourth quarter
RMCO	Recovery Movement Control Order
SAM	Social Accounting Matrix

SOCSO   Social Security Organization

WHO   World Health Organization

WSP   Wage Subsidy Programme

CHAPTER 1

INTRODUCTION

1.1 Background

Coronavirus Disease 2019 (COVID-19) was first diagnosed in Wuhan City, China before it subsequently spread to over 200 countries worldwide. A few months after the first human cases of COVID-19, World Health Organisation (WHO) declared the outbreak a pandemic (WHO, 2020). Malaysia was not spared from the outbreak of pandemic COVID-19, reporting its first case on 25th January 2020, with the number of cases escalating since then. Figure 1.1 shows the number of new cases reported in Malaysia from January to December 2020.

In an effort to mitigate the outbreak of COVID-19, the Malaysian Government imposed a national lockdown called the Movement Control Order (MCO) on 18th March 2020. The MCO remained in place for almost two months until the government eased restrictions and replaced it with the Conditional Movement Control Order (CMCO). The implementation of MCO and CMCO were successful in minimising the transmission rate of COVID-19. On 8th June 2020, the Malaysian government lifted the CMCO and announced the implementation of the Recovery Movement Control Order (RMCO). Despite these efforts, COVID-19 cases rose sharply in early October and remained high until December 2020.

The COVID-19 pandemic has not only placed immense pressure on global healthcare but has also disrupted the social and economic structures. The restrictions imposed by the governments to curb the spread of the virus had devastating impacts on the economy. Businesses were forced to cut down on their operating hours which resulted in a downturn in the production of output. The reduction in labour due to the social distancing measures had alleviated the stress in the businesses.

Output from one country to another country could not be delivered in time due to these disruptions. As businesses continued making losses, the ability to provide job opportunities decreased while some highly-impacted businesses struggled to retain their current labour. The labour market has shown an increase in both the number of unemployed and job losses. The accelerated economic downturn has disrupted social structures. The uncertainty in the economy has left low-income groups in a vulnerable state, exacerbating issues such as poverty, malnutrition, and poor health. COVID-19 has pushed even more low-income groups into poverty, compounding these issues.
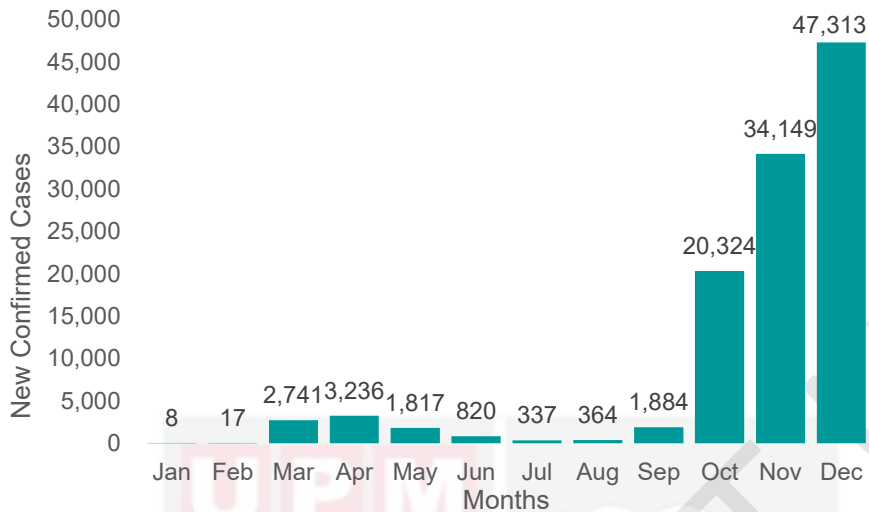
Figure 1.1 : Monthly New Confirmed COVID-19 Cases in Malaysia from January-December 2020
(Source: Our World in Data, 2020)

1.2   Production and Labour Market Disruptions Due to COVID-19

Although the Malaysian government had managed to reduce the health risk with the implementation of lockdowns, this had badly affected the businesses. MCO had seen business closures of non-essential sectors and a reduction in the operating capacity of essential sectors. Businesses in non-essential sectors could only be operated at a limited operating capacity during CMCO.

At a macro level, the disruption in business operation had resulted in a significant decline in the output of our economy. The total output in 2020 decreased by 7% from the previous year, with the Construction sector experiencing the highest percentage loss in output, contracting by 18%. Another sector that registered double-digit losses is Services with a 10% reduction in output. Besides output, final demand is also another variable that showed a significant decline. The total final demand in 2020 declined by 3.7% due to the pandemic.

The decline in the output and final demand led to a decline in the Gross Domestic Product (GDP). The second quarter of 2020 had shown the impacts of MCO and CMCO with the plunge of GDP from 0.7% in the first quarter to -17.1% in the second quarter of 2020 (Department of Statistics Malaysia, 2020a). The third quarter of 2020 also shows a contraction of the economy at a slower pace with the growth rate of GDP registered at -2.7% (Department of Statistics Malaysia, 2020a). GDP contracted further to 3.4% in the fourth quarter of 2020 compared

to the preceding quarter. Overall, in 2020, GDP had reported at -5.6% as compared to 4.3% in 2019 and this is the lowest GDP contraction after the Asian Financial Crisis 1997-1998. A total of 32,469 companies had closed down due to COVID-19 from March to September 2020 (Ministry of Entrepreneur Development and Cooperation, 2020).

At the sectoral level, Agriculture, Construction and Services registered a declining trend in GDP contributions as they are domestic-driven sectors (EIS-UPMCS Centre for Future Labour Market Studies, 2020). Overall, in 2020, Construction sector registered the highest reduction in GDP by 19.4% from RM 66.5 billion to RM 53.6 billion in 2020 (Department of Statistics Malaysia, 2020b). Mining and Quarrying also registered large losses with 10.6% to record GDP of RM 92 billion in 2020 (Department of Statistics Malaysia, 2020b). Despite the social distancing and restrictions measures, Services show moderate losses from RM 820.9 billion to RM 775.7 which account for 5.5% losses in GDP (Department of Statistics Malaysia, 2020b). Manufacturing which is one of the major economic activities also shows moderate losses of 2.7%. The lowest losses in GDP were recorded by Agriculture with 2.2% (Department of Statistics Malaysia, 2020b).

Before COVID-19 hit Malaysia in 2019, Manufacturing sector contributed RM 316.3 billion, representing a 21.4% share of GDP, making it the second-highest sector after Services, which contributed 56.9%. However, in 2020, the GDP for Manufacturing declined to RM 307.8 billion. In 2019, the Agriculture sector contributed 7.2% to the share of GDP with a contribution of RM 101.6 million. Figure 1.2 shows the GDP by sectors for both 2019 and 2020.

Figure 1.2 : Gross Domestic Product (GDP) by Sectors in 2019 and 2020
(Source: Quarterly National Accounts from Department of Statistics Malaysia, 2020)

1.2.1 Labour Market Disruption Due to COVID-19

Economic contraction that began in the second quarter of 2020 resulted in an increase in unemployment rates. The number of unemployed persons rose from 778.8 thousand in April 2020 to 826.1 thousand in May 2020, causing the unemployment rate to climb from 5.0% to 5.3%. Overall, in 2020, the total number of unemployed persons reached 711.0 thousand, compared to 508.2 thousand in 2019. The average annual unemployment rate in Malaysia before the pandemic was between 3.3% to 3.5%.

However, due to the pandemic, the unemployment rate in 2020 rose to 4.5%. The forced closure of some businesses and reduced capacity of other businesses resulted in a decreased demand for labour, which in turn led to an increase in the number of unemployed persons and the unemployment rate. This surge in the unemployment rate is clear evidence of the significant impact that the outbreak of the COVID-19 pandemic had on the labour market. The disruptions due to COVID-19 have detrimental effects, particularly on the labour market and supply chain. The labour market issues are structural issues that become more prevalent amid the pandemic COVID-19.

Besides the unemployment rate, another alarming issue due to the disruption of the labour market is the rise in the loss of employment (LOE). According to the Employment Insurance System Act 2017 (Act 800), LOE refers to insured workers who had been terminated from their jobs due to reasons such as business downsizing, business closure, voluntary separation scheme and mutual separation scheme. In contrast, unemployed persons are defined by DOSM as all persons who did not work during the reference week. In this case, the number of unemployed persons may include both those who actively seek employment and those who do not. LOE and unemployment are inter-related, whereby those individuals who reported the loss of employment will remain unemployed until they received a placement. Theoretically, an increase in LOE will certainly reflect the rise in unemployment.

However, during the outbreak of COVID-19, this assumption had been violated. In June 2020, the total unemployment decreased albeit with the increment of LOE. The COVID-19 pandemic had seen the rise of the informal sector in Malaysia both for low-skilled and high-skilled workers. The demand for low-skilled workers is in the e-hailing industry while high-skilled workers turned into freelance jobs. Those working in the informal sector are considered as self-employed persons. Thus, the violation of labour market theory might be due to the presence of the informal sector in the labour market. Those whom experienced loss of employment potentially joined the informal sector.

Figure 1.3 displays the monthly total unemployment produced by the Department of Statistics Malaysia (DOSM) and the total LOE reported to Employment

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Insurance System (EIS). Based on this figure, LOE had registered an increasing trend since April 2020, a month after the implementation of MCO. The highest LOE was recorded in June 2020 with 18,579 cases compared to 2,478 cases in June 2019. Following the end of the MCO, LOE started to decline as businesses resumed their operations and the labour market entered the recovery phase. However, the surge in new COVID-19 cases in October 2020 led to a tightening of the Movement Control Order, which resulted in a slight increase in LOE to 9,086 in November 2020.
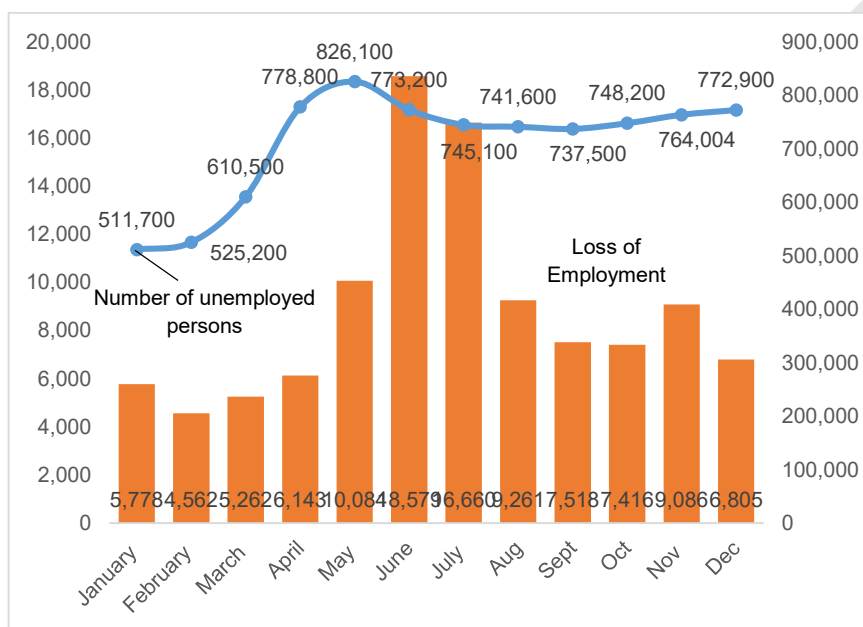
Figure 1.3 : Number of Unemployed Persons and Loss of Employment (LOE) in Malaysia from January-December 2020
(Source: Number of Unemployed Persons from Department of Statistics, 2020 and Loss of Employment from Employment Insurance System, 2020)

A total of 107,154 persons reported losing their jobs in 2020. In the overall economy, the most significant number of LOE was recorded in Q2 2020, which more than doubled compared to Q1 2020. The increasing trend in LOE for Q2 2020 is mainly due to the implementation of non-pharmaceutical interventions (NPIs) imposed by the government in slowing down the spread of COVID-19. These interventions among others include the closure of non-essential sectors and reduction in the operating hours for essential sectors. Despite the prolonged of NPIs in Malaysia, the LOE in Q3 2020 indicates a declining trend, reduced by 4.3% from 34,793 to 33,309. The slight decrease in the LOE is a result of swift labour market policy intervention implemented by the government through the introduction of the Short-Term Economy Recovery Plan, PENJANA.

PENJANA had cushioned the impacts of COVID-19 and supported job retention, particularly through the implementation of the Wage Subsidy Programme. This recovery plan which had been implemented until December 2020, contributed to the continuous declining trend in Q4-2020 with a total LOE registered of 23,437 persons. Another factor contributing to the decline of the LOE trend in Q3-2020 and Q4-2020 was the re-opening of some economic sectors under the Recovery Movement Control Order (RMCO). Based on the quarterly trend, it could be deduced that the LOE is highly vulnerable to the economic restrictions imposed under the MCO. The composition of LOE by sectors and the total for the year 2020 are presented in Table 1.1 below.

In terms of sectoral impacts, the Wholesale and Retail Trade, Hotels and Restaurants sector registered the highest LOE in 2020 which accounts for 27.5% of the total share. This sector has been heavily hit by COVID-19 as the containment measures imposed a major decline in the demand for this sector. Under the MCO, the government has decided to ban domestic and international travelling. Wholesale and Retail Trade were also badly affected by the implementation of MCO as the businesses under this sector were forced to shut down except supermarkets, markets and convenience stores that are selling essential goods.

Manufacturing also reported high LOE in 2020 with a total of 23,411 persons followed by the Financial, Real Estate and Professional and Technical services. According to the Malaysia Economic Performance Report released by the Department of Statistics Malaysia (DOSM), the Manufacturing sector recorded negative growth of 2.6% in 2020. The contraction in the annual growth for the Manufacturing sector has significantly affected the employment in the sector. On the contrary, the lowest LOE was observed in the Human Health and Social Work sector with 769 persons followed by the Agriculture, Forestry and Fishing. These two sectors are among the essential sectors that continue to operate during the MCO.

Table 1.1 : Trends of Sectoral Loss of Employment by Quarter in 2020

Sectors	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Grand Total
Agriculture, Forestry and Fishing	286	261	156	164	867
Construction	1,397	2,353	2,225	1,903	7,878
Education	207	700	672	684	2,263
Financial, Real Estate and Professional and Technical Services	2,378	4,973	4,773	3,540	15,664
Health	135	268	232	134	769
Manufacturing	3,814	7,618	8,272	3,707	23,411
Mining and Quarrying	220	463	569	368	1,620
Other Services [1]	1,674	3,755	3,383	2,643	11,455
Utilities, Transportation and Storage, Information and Communication	1,880	3,399	3,493	5,005	13,777
Wholesale and Retail Trade, Hotels and Restaurants	3,611	11,016	9,534	5,289	29,450
Grand Total	15,602	34,806	33,309	23,437	107,154

Note: [1]Other Services include Activities of Households; Administrative and Support Services; Arts, Entertainment & Recreation; Defence Compulsory Social Security; and Other Classification of Services.
(Source: Employment Insurance System, 2020)

1.2.2 Supply-Chain Disruption Due to COVID-19

COVID-19 also has disrupted supply chains around the world and the disruption had negative impacts on businesses. (Araz, Choi, Olson and Salman, 2020) stressed that COVID-19 is probably the most severe disruption to the global supply chain in the last decade. Production stoppages due to the COVID-19 pandemic had disrupted the global supply chain causing multi-country disruption. Difficulties in the logistics and transportation sector had delayed the activity and trade at the global level. According to the United Nations Conference on Trade and Development (UNCTAD), the international maritime trade volumes contracted by -3.8% and the cargo vessel calls fell by -5.1% in 2020. The Purchasing Managers' Index (PMI) spiked in early 2020 indicating the supply chain disruptions developed during the pandemic (International Monetary Fund, 2021).

In Malaysia, the implementation of MCO had seen businesses closure across sectors and even after the re-opening of the economy the businesses were not able to operate at full capacity as a result of social-distancing measures. The disruptions in production which lead to supply shock had given impacts on output and sustainability of the businesses. In Malaysia, supply chain disruption has significant impacts on exports and imports. Malaysia's total trade performance in 2020 had a significant decline of RM 1.8 trillion which resulted in a contraction of 3.6% from the previous year. Exports declined by 1.4% to register RM 981.0 billion while imports declined by 6.3%. The decrease in exports contributed to the reduction of exports to Thailand, India, Bangladesh, Vietnam and Japan. Based on the quarterly statistics, the second quarter of 2020 where the implementation of MCO took place showed the highest decline with a 15.1% reduction in total trade compared to the same quarter in 2019. This clearly shows the impacts of COVID-19 on imports and exports.

To address the impacts of COVID-19 disruptions on the supply and demand side of the economy, the input-output modelling technique is utilised. This technique is supported using the latest input-output table released by the DOSM. Economists frequently applied the input-output modelling technique to study the relationship between different production sectors. In the case of labour market and supply chain disruptions, an extended supply-driven input-output model is developed. Labour market disruptions are represented by the LOE while the supply chain is represented by the supply shock which translates into the percentage of operating capacity. The development will help to examine the extent to which LOE and supply shock had impacted the macroeconomic indicators by focusing on output, GDP and employment income. This attempt will contribute to the development of the model to quantify the impacts of LOE and supply chain disruptions during the future unprecedented crisis and natural disasters such as typhoons.

1.3   Problem Statement

Pandemics have disrupted modern civilisation and industrialization which started in 1800s on several occasions: H1N1 (Spanish Flu) in 1918, H2N2 in 1957, H3N2 in 1968, and H1N1 2009 in 2009 (CDC, 2018). In 2020, the world witnessed another devastating and unprecedented impact of the COVID-19 pandemic. The implementation of mitigation and virus containment measures to curb the spread of COVID-19 such as lockdowns worsen the impacts of the pandemic on the economy, where people are not allowed to work. The implementation of MCO in Malaysia had temporarily stopped some of the other economic activities causing the demand for labour to reduce. As a result of health and economic disruption due to the COVID-19, there is a significant rise in the loss of employment due to business closure and downsizing which led to a shortage of supply to meet the final consumption.

Another significant impact of the implementation of virus containment measures due to the COVID-19 is the disruption in the supply chain. The nationwide lockdowns have disrupted supply chains and logistics, hitting some industries harder than others. During the MCO, only the essential services can operate at a minimum capacity and most businesses had to temporarily shut down their operation. Thus, a sector production interruption will create "domino effects" that disrupt the production of the other sectors that demand its inputs. The extensive period of production stoppages triggers a deficit in supply. The supply chain disruptions may take place in different forms such as logistics delays, port stoppages and export bans that led to a deficit in supply. The inability to produce output from a sector will result into decline in the supply of intermediate inputs for another sector. As example, the Food Manufacturing sector required agricultural products as the intermediate inputs to deliver their output. Without these products, the sector will not able to operate at their optimum level.

Various countries also introduced lockdown measures to contain the spread of the COVID-19. Like Malaysia, the introduction of restrictions and lockdown measures in most of the countries led to the closure of businesses for non-essential economic activities and shorter operating hours for essential economic activities. In a normal recession, the product market experienced a deficit in demand. However, the implementation of lockdown globally to curb the spread of COVID-19 had led to production stoppages and resulted to deficit in supply. From a macro-economic perspective, the prolonged lockdown measure probably had a share in the contraction of GDP. Understanding the supply chain disruption effect is, therefore, important to ensure that the policy measures to contain the virus spread is based on the degree of the economic integration of a particular sector.

The implementation of the MCO had seen the introduction of essential sectors in the economy. In MCO 1.0, these sectors were allowed to operate with half of the total labour and reduced operating hours. Under the Prevention and Control of Infectious Diseases (Measures within the Infected Local Areas) Regulations 2020, there were less than 25 sectors listed as essential sectors. Among the sectors deemed as essential include banking and finance, healthcare and medical, electricity and energy, food supply, manufacturing of pharmaceuticals and medical equipments and defence and security. As the country moved into a series of MCO the restrictions gradually loosen, more sectors were allowed to operate and the operating capacity had been increased. However, the selection of essential sectors was made based on the health-risk assessment without considering the economic impacts. The sectors in the economy are highly dependent on each other and the closure of a sector will trigger impacts on another sector depending on them. Hence, identification of key sectors is crucial in preventing the temporary closure of these sectors as it will lead to disruption of the supply chain and be detrimental to the economy.

These two issues related to labour market distortion and supply chain disruption during the pandemic form the motivation of the study. Theoretically, it is known that an adverse supply shock would give a negative impact on economic performance. The unique nature of the pandemic-led disruption is that the adverse supply shock, which in this study case related to job losses and supply chain disruption, does not only take place in a specific location or industry but also transpire across the supply chain within the economy. This indicates that there is an economic-wide impact that could incur a high cost to the economy.

1.4   Research Questions

This study seeks to answer two major research questions:

1.   What are the macroeconomic impacts of the loss of employment and supply chain disruption during COVID-19 on the Malaysian economy?
2.   Which key sectors in the Malaysian economy should be prioritised to mitigate the economic and labour market losses during the pandemic?

1.5   Objectives

This study aims to investigate the impact of the labour market and supply chain disruptions on the economy and identify approaches to mitigate the economic and labour market losses caused by COVID-19. Specifically, the study sets out to achieve the following objectives:

I.   To estimate the macroeconomic impacts of the loss of employment and supply chain disruption during COVID-19 on the economy; and

II.   To identify key sectors for mitigating economic and labour market losses during the pandemic.

1.6   Significance of the Study

In relation to policy purposes, this study has three significant contributions. Firstly, it provides empirical contributions by constructing a disruption model to assess the impacts of the loss of employment and supply chain shock due to the COVID-19 pandemic in Malaysia. The disruption model will be developed by expanding the supply-driven input-output model to integrate the LOE data. To illustrate the impacts of COVID-19, three macroeconomic indicators, namely output, final demand and GDP will be assessed. In this regard, the model developed in this study would help determine the impacts of disruptions, particularly on the labour market and during a pandemic and unprecedented events such as natural disasters. In terms of supply chain disruption, this study will utilise the demand-driven input-output model to measure the economic losses due to the implementation of MCO 1.0.

Secondly, the study contributes to the assessment of government policy in response to the pandemic COVID-19. In evaluating the supply shock impacts due to pandemics, this study examines supply shock disruptions by considering the inoperability of sectors during the MCO 1.0. Thus, the findings from the analysis will be valuable in assessing the impact of government response and serving as input for future policy implementation to mitigate the implications of the COVID-19 pandemic on the economy. The impact assesment from this study has the potential to benefit the development of economic packages aimed at aiding businesses from the most affected sectors to survive in the post-pandemic. This will ensure that government support package are channelled to the most affected sectors and facilitate the reopening of the economy. Lastly, the identification of key sectors in the economy and labour market facilitates decision-making for policy-makers and the government to prioritise the crucial sectors in the implementation of future non-pharmaceutical measures.

1.7   Organisation of the Study

This study contains five chapters. Chapter 1 presents the introduction to the study, problem statement, research questions that need to be answered, objectives to be achieved and the significance of the study. Chapter 2 presents past literatures related to this study. Chapter 3 describes the methodological approach undertaken and justifies the data sources used. Chapter 4 presents

the major findings from the analyses conducted on the labour and supply chain disruptions model and reveals the findings of the linkages analysis to assess the key sectors of the economy and labour market. The final chapter, Chapter 5 summarises the entire study by detailing the motivation and relevance of the study, major findings, policy recommendations and addressing the limitations of the study.

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