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Labour Market Reactions to Lockdown Measures during the Covid-19 Pandemic in Malaysia: An Empirical Note

(Tindakbalas Pasaran Buruh terhadap Langkah Sekatan semasa Pandemik Covid-19 di Malaysia: Satu Catatan Empirik)

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ABSTRACT

In this empirical note, we examine the relationship between the loss of employment and lockdown measures undertaken by the Malaysian government during the Covid-19 pandemic outbreak over the period from 25 January 2020 to 10 September 2020. By using cointegration analysis, our results suggest that there are both long-run and short-run relationships between loss of employment and lockdown measures in Malaysia. Lockdown measures show positive impact on the number of workers who lost their jobs during the pandemic. The loss of employment increases by 0.35% to 1.1% for every 1% increase in the lockdown measures.

Keywords: *Covid-19; Lockdown; Loss of employment; Cointegration; Malaysia*
JEL Codes: *I18 H30 J64*

ABSTRAK

Catatan empirik ini meneliti hubungan di antara kehilangan pekerjaan dan langkah sekatan yang di ambil oleh kerajaan Malaysia semasa penyebaran pandemik Covid-19 untuk tempoh 25 Januari 2020 hingga 10 September 2020. Dengan mengguna analisa kointegrasi hasil dapatan mencadangkan bahawa wujud kedua-dua hubungan jangka panjang dan jangka pendek di antara kehilangan pekerjaan dan langkah sekatan di Malaysia. Langkah sekatan menunjukkan kesan positif terhadap jumlah pekerja yang kehilangan pekerjaan semasa pandemik ini. Kehilangan pekerjaan meningkat sebanyak 0.35% hingga 1.1% bagi setiap 1% peningkatan terhadap langkah sekatan.

Kata kunci: *Covid-19; Sekatan ;Kehilangan pekerjaan; Kointegrasi; Malaysia*
Kod JEL: *I18 H30 J64*

INTRODUCTION

The unprecedented outbreak of the Covid-19 pandemic and its speed in spreading all over the world has devastating effects on human life and the economy. Many governments have to face the tradeoff between public health safety and the health of the economy. Although both Donald Trump, the president of the US and Jair Bolsorano, the president of Brazil choose the latter (Moosa 2020), however most countries choose the former. Without vaccine, the number of deaths due to Covid-19 pandemic is inevitable unless action are taken to isolate the infected person from the public, by practicing the new normal behaviour in wearing mask and social distancing in mass gatherings or confined spaces (Qiang & Jiang 2020). The non-pharmaceutical interventions (NPIs) or lockdown measures such as the closing of schools and workplaces, restrictions on domestic and international travels, prohibitions of mass gatherings, public events, public transport, and stay at home requirements have been shown to be good measures in mitigating the spread of Covid-19 and the increase of new cases and deaths (Conyon, He & Thomsen 2020; Deb, Furceri, Ostry & Tawk 2020a, 2020b; Moosa 2020).

Nevertheless, these lockdown measures have dampening effects on the economy (Atalan 2020; World Bank 2020), in particular the goods markets, financial markets as well as the labour markets. The spread of Covid-19 and the imposition of the lockdown measures disrupt global trade and supply chains, create fear and uncertainty in the financial markets, and contribute to the number of job losses. Meier and Pinto (2020) pointed out that the US sectors that are highly dependent on imports from China are badly affected; these firms have to cut their production, lay-off more workers, and engage in less trading. In India, Walter (2020) reiterated that the lockdown measures had a direct impact on trade, manufacturing and the construction sectors. On the other hand, studies examining the impact of lockdown on the stock markets are numerous and of mixed results. Eleftheriou and Patsoulis (2020), Liew and Puah (2020) and Phang and Narayan (2020) assert that lockdown measures have adverse effects on the stock markets; while Ozili and Arun (2020), Zaremba, Kizys, Aharon and Demir (2020), and Anh and Gan (2020) found that the stock markets responded positively to the lockdown measures. For the Malaysian stock market, a study by Chia, Liew and Rowland (2020) indicate that the lockdown variable shows positive impact on all the stock returns in the Bursa Malaysia. On the other hand, Demir, Bilgin, Karabulut and Doker (2020) and Kinateder, Campbell and Choudhury (2021) indicated that gold, sovereign bonds and cryptocurrencies are safe alternative assets for investors during the Covid-19 pandemic.

Studies have shown that the lockdown measures adopted by many countries to contain the spread of Covid-19 have severe impact on the labour markets. Juranek, Paetzold, Winner and Zoutman (2020) asserted that the lockdown comes at a cost in terms of labour market performance in the short-run. Their study on the Nordic countries have found that beginning in the early weeks of 2020, the new number of unemployed people rose sharply in Norway, Denmark and Finland. Kong and Prinz (2020) found that in the US, the closing of school, bar and restaurant, non-essential businesses, stay at home requirement, banned on mass gatherings contribute less than 13% increase in unemployment. In Japan, Kikuchi, Kitao and Mikoshiba (2020) found that apart from the regular, young, and female workers working in the social and non-flexible job environment that was hit by the pandemic, however, the hardest hit was the contingent workers. Studies on the MENA countries (Hassan, Rabbani & Abdullah 2020), U.S., Germany and Singapore (Reichelt, Makovi & Sargsyan 2020) and in Asia (Awad & Konn 2020) found that the Covid-19 pandemic has severely affecting the women compared to the men. In India, the economic shutdown causes 32 million regular informal workers, 89 million casual workers, and 107 million self employed to lose their jobs; and the majority of these workers were poor and with low-education background (Ghose 2020).

Shuai, Chmura and Stinchcomb (2020) found that Covid-19 has resulted in a decline in labour demand; and the worst affected are the young workers working in the leisure and hospitality sectors (Gould & Kassa 2020). On the other hand, Beland, Brodeur and Wright (2020) asserted that the negative impact of Covid-19 pandemic was greater for men, younger workers, Hispanic and less educated workers. In the European Union countries, Pouliakas and Branka (2020) and Fana, Tolan, Torrejon, Brancati and Fernandez-Macias (2020) indicated that the most vulnerable groups in the labour market affected by the pandemic include the women, non-natives, self-employed and temporary workers, the lower educated and low-wage workers in the micro-enterprises. On the other hand, a study on G20 countries by ILO and OECD (2020), the Covid-19 and the lockdown measures cause an unprecedented fall in employment in the G20. For example, between December 2019 and April 2020, there was an employment decline by as much as 40% in Mexico and 8-9% in Japan and Korea; total hours worked decline by 46% in Mexico and 10% in Australia; and the unemployment rate increased substantially in Canada and the U.S. and in fact more than during the Global Financial Crisis.

In Malaysia, the first new confirmed cases of the Covid-19 were detected on 25 January 2020. On 16 March 2020, the number of new confirmed cases reached 190 and the government of Malaysia quickly announced the imposition of the Movement Control Order (MCO) starting 18 March 2020 in order to "flatten the curve." (Aziz, Othman, Lugova & Suleiman 2020; Tang 2020; Shah, Safri, Thevadas, Noordin, Rahman, Sekawi, Ideris & Sultan 2020). The lockdown measures included the closure of non-essential businesses, banning on mass gatherings and public events, closing of schools and institutions of higher learning, implementation of stay at home orders, restrictions of into and out on international travel, limitations on domestic travel, and workplace closure and work from home requirements. The MCO impacted the Malaysian labour market

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severely with the number of people unemployed increased quickly. The unemployment rate has increased from 3.2% in the fourth quarter of 2019 to 3.5% in the first quarter of 2020, and to 5.1% in the second quarter of 2020 (DOSM 2020). The number of unemployed people increases from 512 thousand in the fourth quarter of 2019, to 547 thousand in the first quarter of 2020 to 792 thousand in the second quarter of 2020.

Like many other countries, the impact of the Covid-19 pandemic and MCO measures is disproportionate among the Malaysian population. Among unemployed workers, the number of women affected by the Covid-19 and lockdown measures is greater than men. Similarly, the disproportionate impact of Covid-19 is more severe on younger workers (age group of 15-24 years) compared to older workers (age group 35-33 years) (DOSM 2020). Cheng (2020) and Rahman, Jasmin and Schmillen (2020) pointed out that women and young low-educated workers have been severely affected by the pandemic. Similarly, foreign workers were also badly affected by the pandemic and lockdown measures (Wahab 2020) despite their importance contribution to the Malaysian economy (Ismail 2003). During the MCO, the foreign workers were allowed to work for a limited number of days in a month and some were not permitted to work at all (Wahab 2020). At the sectoral level, an ILO study conducted by Lin (2020) found that job losses were mainly concentrated in the agriculture sector with 21.9% of the total job lost from a survey of 168,182 respondents; and 33.3% of workers in the agriculture sector were subject to reduced working hours.

The purpose of this paper is to provide empirical evidence on the impact of lockdown measure on the Malaysian labour market, using loss of employment as a proxy for labour market reaction indicator. Figures 1 to 3 clearly show the unprecedented increase in the number of unemployed, unemployment rate and loss of employment for the year 2020 as compared to the earlier years in 2018 and 2019. There is a substantial gap between the year 2020 and both 2018 and 2019 starting from March to September.

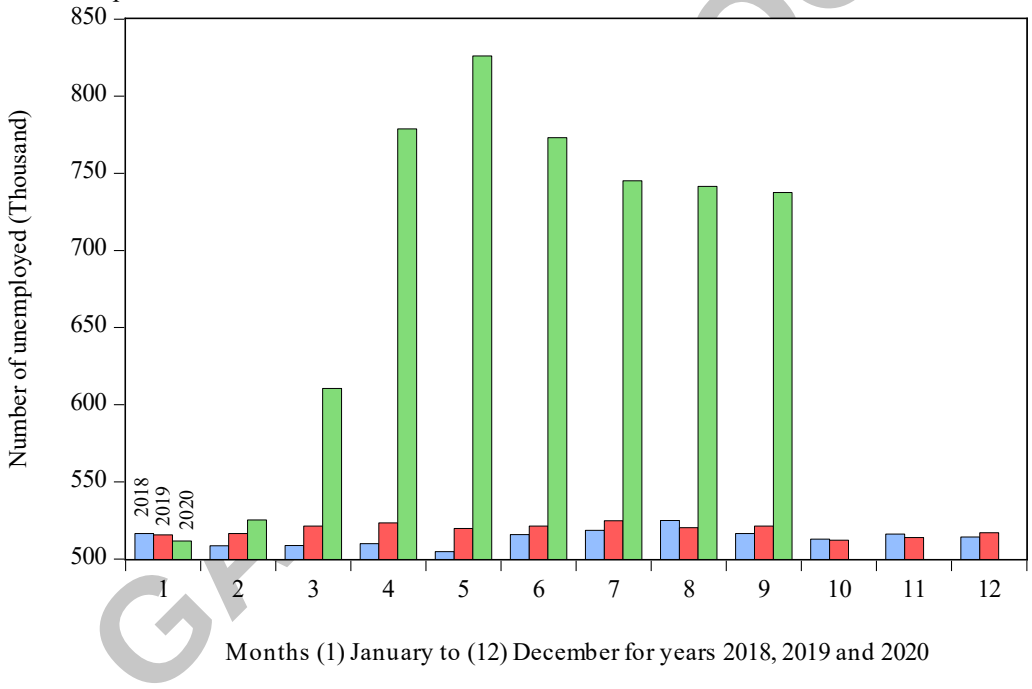

FIGURE 1. The number of unemployed for 2018, 2019 and 2020 from January to December

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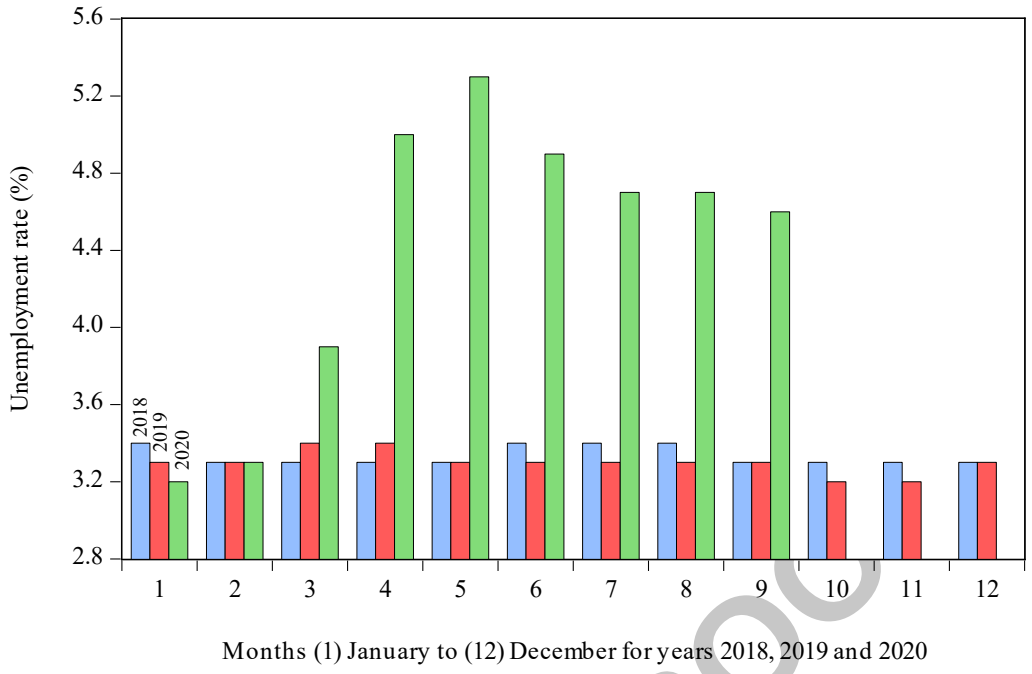

FIGURE 2. Unemployment rate for 2018, 2019 and 2020 from January to December

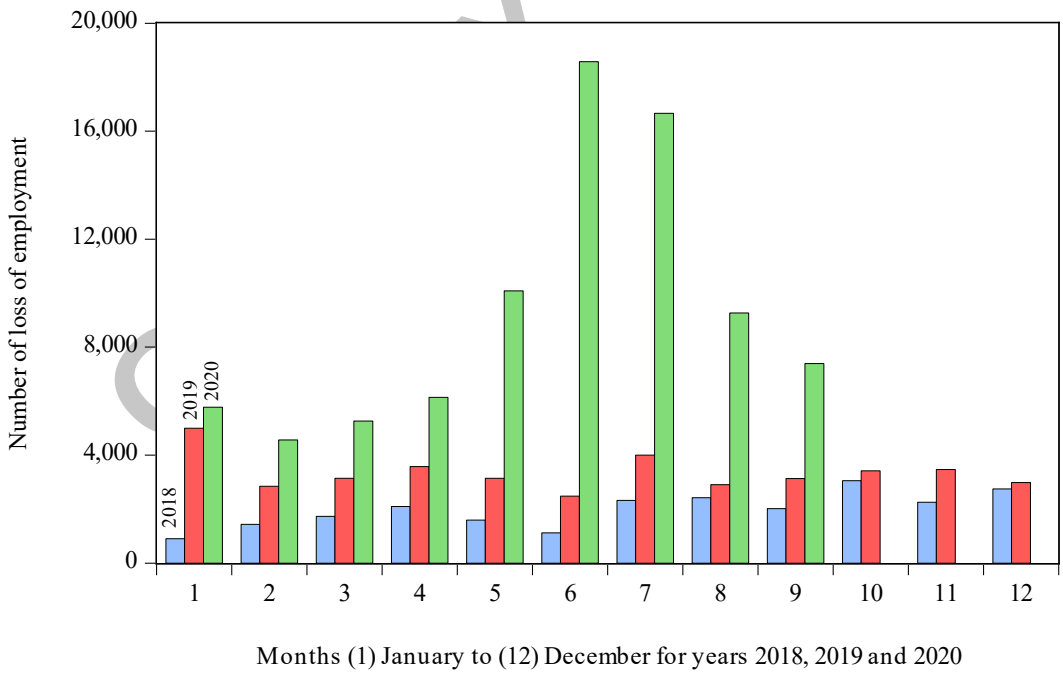

FIGURE 3. Number of loss of employment for 2018, 2019 and 2020 from January to December

To assess the reactions of the labour market to the lockdown measures, we are using daily data on the number of loss of employment. The novelty of the present study is the use of daily administrative data compiled by the Employment Insurance System (EIS) at PERKESO, Putrajaya. The unemployed workers who are members of the Social Security Organization (SOCSO) are required to register with the EIS in order to make their claims for the loss of employment. The EIS centre reports these statistics daily and weekly. Our results suggest that 1% increase in the lockdown index increases the number of loss of employment by 0.35% to 1.1%.

DATA AND METHODOLOGY

To examine the impact of lockdown on the loss of employment, we specify the following simple bi-variate model as,

$$log\ y_t = \alpha_0 + \alpha_1 log\ x_t + \mu_t \quad (1)$$

where y_t is the loss of employment and x_t is lockdown measures; while parameter μ_t is the error term assumed to have zero mean and constant variance. It is expected *a priori* that α_1>0; implying that an increase in lockdown intensity will increase the number of job losses.

In this study, Ordinary Least Squares (OLS) with robust standard error due to Newey-West (Newey & West 1987) heteroscedasticity and autocorrelation consistent (HAC) estimates of the standard error is used to estimate Equation (1). Nevertheless, we are aware that estimating Equation (1) that consists of non-stationary variables will result in spurious regression problem. Thus, we need to determine the order of integration of each of the variables involved. To do this we employ the Kwiatkowski, Phillips, Schmidt and Shin (KPSS1992) unit root test. By employing Kwiatkowski et al.(1992) unit root test procedure, the null hypothesis is trend stationarity against the alternative hypothesis of unit root. Rejection of null hypothesis of trend stationarity would suggest that the series has a unit root, that is, y_t and/or x_t is I(1) series in level, and I(0) in first-difference.

The regression results by running Equation (1) with non-stationary I(1) variables will be spurious, unless the variables are cointegrated. To ascertain the validity of Equation (1) we test for cointegration. A simple test for cointegrationis conducted using the Engle and Granger (1987) two-step procedure. Following this procedure, we save the residuals on estimating Equation (1) in the first step and then proceed with the second step by testing the residuals for unit root using the conventional Dicker and Fuller (1981) unit root test. The rejection of the null hypothesis of unit root suggests that the residuals are stationary, implying that the variables are cointegrated – such that there is long-run relationship between y_t and x_t. A cointegrated regression also signifies that the estimated regression is a non-spurious, stable, and valid long-run model.

In this study we also estimate a short-run or error-correction model as follows,

$$\Delta \log y_t = \beta_0 + \beta_1 ecm_{t-1} + \sum_{i=1}^{p} \gamma_{1i} \Delta \log y_{t-i} + \sum_{i=0}^{q} \gamma_{2i} \Delta \log x_{t-i} + \varepsilon_t \quad (2)$$

where Δ is the difference operator, and ecm_{t-1} is the error-correction term derived from one period lagged residuals from Equation (1), that is, $ecm_{t-1} = \mu_{t-1} = log\ y_{t-1} - (\alpha_0 + \alpha_1 log\ x_{t-1})$. The error term is assumed to have zero mean and constant variance. In this study, we estimate Equation (2) using the OLS with robust standard error due to Newey and West (1987) procedure. A negative and significant parameter, β_1 of the ecm_{t-1} term will suggests cointegration between y_t and x_t (Engle & Granger 1987)

Next, we proceed and test the robustness of the above results by employing the Dynamic OLS (DOLS) proposed by Stock and Watson (1993). This procedure is more efficient and robust when used in small samples as it is able to address the problem of endogeneity, heteroscedasticity, autocorrelation and non-normality of the errors. DOLS procedure regresses one of the I(1) variables on other I(1) variables, the I(0) variables, and the first difference of I(1) variables lags and leads. Taking the variables with the first-difference, the associated lags and leads will eliminate simultaneity bias and small sample bias that exists among regressors. To test for cointgeration when using the DOLS estimators, we employ the Hansen (1992) instability test. According to Hansen (1992), the L_c statistic is an LM test statistic and can be used to test the null hypothesis of cointegration against the alternative of no cointegration. For the short-term model, we follow the same procedure as above to estimate an error-correction model from the DOLS estimated regression's residual as per Equation (2).

In this study, we use novel administrative data that records the daily loss of the number of employment, which was accessed from the Employment Insurance System (EIS) at Wisma PERKESO for the period January 25, 2020 to September 10, 2020. During the pandemic, the administrators at PERKESO started to produce daily and weekly reports of newly registered individuals who have lost their jobs and the number of insurance claims. The daily and weekly reports also focus on the vacancies, placements and jobseekers. On the other hand, the daily data of lockdown measures were taken from the Covid-19

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Government Response Tracker (OxCGRT) database compiled by Hale at al. (2020). OxCGRT database provides several lockdown measures, namely; school closing, workplace closing, public events cancellation, gathering restrictions, stay at home, transportation restrictions, internal movement restrictions and international travel controls. In this study, we also use the stringency index which is an aggregation of all the eight lockdown policy variables. OxCGRT database gives a score between 0 and 100 for the stringency index while the eight lockdown policy variables were given ordinal values (for further details, see, Hale et al 2020). We also use the formula $\log y_t = \log[y_t + \sqrt{(y^2 + 1)}]$ to transform the series into logarithm (Busse & Hefeker 2007). By employing this method, we maintain the sign of y_t.

RESULTS

Table 1 reports the summary statistics of the variables used in the study. The mean for the loss of employment is 6.16, and the maximum and minimum values are 8.03 and 2.64, and the standard deviation is 0.89. On the other hand, the standard deviations of the lockdown policy response variables are 0.72 for domestic travel, 0.61 for gatherings, 0.28 for international travel, 0.56 for public events, 0.75 for school closure, 0.43 for stay at home, 0.67 for workplace closure and 0.52 for the stringency index. The negative skewness showed by all series, except for stay at home, indicates that these series show longer or fatter tail on the left side of the distribution. Nonetheless, all variables show non-normality in the series as indicated by the Jarque-Bera tests.

TABLE 1. Descriptive Statistics

Series	No. obs	Mean	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
Loss of employment	230	6.16	8.03	2.64	0.89	-0.91	4.33	48.68***
Domestic travel	230	0.77	1.44	0.00	0.72	-0.14	1.02	38.34***
Gatherings	230	1.18	1.82	0.00	0.61	-1.35	3.06	70.23***
International travel	230	1.81	2.09	0.00	0.28	-5.51	35.97	11577.67***
Public events	230	1.15	1.44	0.00	0.56	-1.51	3.39	88.75***
School closure	230	1.21	1.82	0.00	0.75	-0.88	1.98	39.58***
Stay at home	230	0.32	0.88	0.00	0.43	0.56	1.31	39.27***
Workplace closure	230	1.19	1.82	0.00	0.67	-1.10	2.51	48.81***
Stringency index	230	4.55	5.01	3.10	0.52	-1.17	3.06	52.59***

Notes: Asterisks ***,**,* denote statistically significant at 1%, 5% and 10%, respectively. All series are in natural logarithm.

The correlation matrix in Table 2 shows the correlation between the variables used in the study. It can be seen that the daily loss of employment is positively related to all the lockdown variables (except for domestic travel and stay at home). Strong correlations are shown by all the positive covariates with the loss of employment series. Table 2 also suggests that there is strong positive correlation between the lockdown policy response variables. This is expected as some lockdown policy variables have ordinal values, and they are also being aggregated in the other index.

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TABLE 2. Correlation Matrix

	Loss of employment	Domestic travel	Gatherings	International travel	Public events	School closure	Stay at home	Work-place closure	Stringency index
Loss of employment	1								
Domestic travel	-0.03	1.00							
	(-0.48)								
Gatherings	0.37***	0.57***	1.00						
	(6.02)	(10.42)							
International travel	0.30***	0.18**	0.37***	1.00					

	(4.74)	(2.75)	(5.97)						
Public events	0.38***	0.56***	0.95***	0.35***	1.00				
	(6.25)	(10.16)	(46.30)	(5.58)					
School closure	0.31***	0.70***	0.83***	0.32***	0.82***	1.00			
	(4.98)	(14.72)	(22.05)	(5.04)	(21.55)				
Stay at home	-0.06	0.71***	0.43***	0.18**	0.39***	0.61***	1.00		
	(-0.88)	(15.11)	(7.27)	(2.71)	(6.49)	(11.74)			
Workplace closure	0.32***	0.64***	0.89***	0.29***	0.93***	0.85***	0.53***	1.00	
	(5.01)	(12.67)	(29.15)	(4.61)	(37.80)	(24.82)	(9.45)		
Stringency index	0.32***	0.73***	0.93***	0.47***	0.93***	0.92***	0.63***	0.95***	1
	(5.18)	(16.15)	(37.01)	(8.07)	(38.32)	(34.64)	(12.14)	(45.13)	

Notes: Asterisks ***,**,* denote statistically significant at 1%, 5% and 10%, respectively. Figures in round brackets are t-statistics.

The results of the KPSS unit root tests for the order of integration of the series presented in Table 3 clearly suggest all variables are I(1), indicating that the series have achieved stationarity after taking first-difference. These result suggest that all variables are non-stationary in levels and their first-differences are stationary, implying that they are I(0). Consequently, estimating non-stationary or integrated variables will produce spurious result, in which one cannot make inferences and it also invalidates hypothesis testing. Thus, cointegrability among variables is important to validate a regression model.

TABLE 3. Results of KPSS Unit Root Tests for the Order of Integration on the Series

Series	Level:		First-difference:	
	Intercept	Intercept + trend	Intercept	Intercept + trend
Loss of employment	1.40 (8)***	0.46 (5)***	0.08 (39)	0.07 (39)
Domestic travel	0.29 (11)	0.22 (11)***	0.08 (0)	0.08 (0)
Gatherings	1.12 (11)***	0.37 (11)***	0.17 (1)	0.04 (2)
International travel	0.46 (9)**	0.20 (9)**	0.31 (1)	0.10 (1)
Public events	1.17 (11)***	0.38 (11)***	0.31 (2)	0.06 (3)
School closure	0.62 (11)**	0.35 (11)***	0.10 (6)	0.04 (6)
Stay at home	0.49 (11)**	0.36 (11)***	0.18 (0)	0.07 (1)
Workplace closure	0.90 (11)***	0.33 (11)***	0.14 (1)	0.05 (1)
Stringency index	0.84 (11)***	0.39 (11)***	0.45 (5)	0.09 (2)

Notes: Asterisks ***,**,* denote statistically significant at 1%, 5% and 10%, respectively. Figures in round brackets (…) are truncated lag length

Table 4 presents the results of the cointegration tests as well as the estimated long-run models for the loss of employment and all the lockdown policy variables using OLS with robust standard error. Panel A presents the results of the long-run models. The cointegration tests suggest that there are no lockdown models that are not cointegrated. In all cases, the DF t-statistics suggest that the null hypothesis of non-cointegration can be rejected at least at the 10% level. Nevertheless, except for domestic travel and stay at home, other lockdown policy variables show positive impact on the loss of employment in Malaysia. Results from the error-correction models as shown in Panel B clearly support the evidence that the loss of employment and the lockdown policy variables are cointegrated. The estimated coefficients of the ecm_{t-1} terms are statistically significant at the 1% level. Both results in Panels A and B support the long-run relationships between the loss of employment and the lockdown policy indicators.

TABLE 4. Results of the Impact of Lockdown on Loss of Employment Using OLS With Robust Standard Error

Independent variables	$constant$	$lockdown$	R^2	SER	DF *t-stat*
Panel A. Long-run model, loe_t					
Domestic travel	6.1934***	-0.0388	0.0010	0.8873	-2.19**
	(37.583)	(-0.2915)			
Restrictions on gathering	5.5259***	0.5411***	0.1373	0.8246	-2.81***
	(42.823)	(4.9545)			
International travel	4.4767***	0.9312***	0.0896	0.8470	-1.78*
	(8.3289)	(3.1360)			
Cancel public events	5.4648***	0.6058***	0.1462	0.8203	-2.73***
	(38.709)	(5.0305)			

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School closure	5.7170***	0.3687***	0.0981	0.8431	-2.02**
	(43.368)	(3.6387)			
Stay at home	6.2023***	-0.1208	0.0033	0.8863	-2.20**
	(49.197)	(-0.5947)			
Workplace closure	5.6668***	0.4181***	0.0992	0.8426	-2.58***
	(44.466)	(3.7428)			
Stringent index	3.6359***	0.5552***	0.1054	0.8397	-1.91*
	(5.6823)	(3.8286)			
	$constant$	ecm_{t-1}	Δloe_{t-1}	R^2	SER
Panel B. Short-run model, Δloe_t					
Domestic travel	0.0118	-0.4299***	0.1884***	0.2232	0.6495
	(0.2767)	(-9.6039)	(3.4556)		
Restrictions on gathering	0.0119	-0.5057***	0.2272***	0.2573	0.6351
	(0.2825)	(-9.3576)	(3.7019)		
International travel	0.0118	-0.4539***	0.2021***	0.2212	0.6504
	(0.2715)	(-9.2912)	(3.5310)		
Cancel public events	0.0119	-0.5155***	0.2331***	0.2633	0.6326
	(0.2797)	(-9.2444)	(3.6470)		
School closure	0.0118	-0.4819***	0.2119***	0.2487	0.6388
	(0.2775)	(-8.8304)	(3.4026)		
Stay at home	0.0119	-0.4304***	0.1885***	0.2232	0.6495
	(0.2793)	(-9.6128)	(3.4759)		
Workplace closure	0.0119	-0.4811***	0.2165***	0.2450	0.6404
	(0.2786)	(-8.3910)	(3.3644)		
Stringent index	0.0119	-0.4807***	0.2146***	0.2433	0.6411
	(0.2764)	(-8.2564)	(3.3419)		

Notes: Asterisks ***,**,* denote statistically significant at 1%, 5% and 10%, respectively. Figures in round brackets are t-statistics. For the cointegration tests (with null hypothesis of non-cointegration), the Engle and Granger (1987) two-step procedure was performed to test on the residuals of the cointegrating regressions. Then the residuals were tested for unit root, and the calculated Dickey and Fuller (1981) t-statistics were compared with those computed in MacKinnon (1996). R^2 and SER denote R-squared and standard error of regression, respectively. loe denotes loss of employment while Δloe denotes loe in first-difference.

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TABLE 5. Results of the Impact of Lockdown on Loss of Employment Using DOLS

Independent variables	$constant$	$lockdown$	R^2	SER	DF *t-stat*
Panel A. Long-run model, loe_t					
Domestic travel	6.1988***	-0.0444	0.0040	0.8936	0.0034
	(44.669)	(-0.3338)			
Restrictions on gathering	5.5135***	0.5569***	0.1526	0.8242	0.0041
	(31.370)	(4.1969)			
International travel	4.1919***	1.0872***	0.1066	0.8463	0.0046
	(6.8401)	(3.2594)			
Cancel public events	5.4671***	0.6150***	0.1759	0.8128	0.0040
	(29.535)	(4.2804)			
School closure	5.7091***	0.3802***	0.1137	0.8429	0.0036
	(35.147)	(3.3202)			
Stay at home	6.1941***	-0.0992	0.0137	0.8892	0.0032
	(52.819)	(-0.4476)			
Workplace closure	5.6430***	0.4375***	0.1088	0.8452	0.0039

	(32.139)	(3.3874)			
Stringent index	3.6551***	0.5530***	0.1170	0.8414	0.0041
	(4.7944)	(3.3324)			

	$constant$	ecm_{t-1}	Δloe_{t-1}	R^2	SER
Panel B. Short-run model, Δloe_t					
Domestic travel	0.0125	-0.4289***	0.1867***	0.2151	0.6501
	(0.2940)	(-9.6507)	(3.4427)		
Restrictions on gathering	0.0119	-0.5057***	0.2272***	0.2573	0.6351
	(0.2825)	(-9.3576)	(3.7019)		
International travel	0.0124	-0.4674***	0.2091***	0.2290	0.6471
	(0.2806)	(-9.4660)	(3.5746)		
Cancel public events	0.0123	-0.4996***	0.2153***	0.2414	0.6419
	(0.2978)	(-9.0877)	(3.4852)		
School closure	0.0123	-0.4843***	0.2140***	0.2452	0.6403
	(0.2903)	(-8.5013)	(3.4367)		
Stay at home	0.0125	-0.4351***	0.1878***	0.2265	0.6481
	(0.2955)	(-9.7498)	(3.4845)		
Workplace closure	0.0123	-0.4813***	0.2150***	0.2426	0.6414
	(0.2907)	(-8.3062)	(3.3319)		
Stringent index	0.0123	-0.4908***	0.2172***	0.2507	0.6380
	(0.2877)	(-8.2760)	(3.3753)		

Notes: Asterisks ***,**,* denote statistically significant at 1%, 5% and 10%, respectively. Figures in round brackets are t-statistics. The L_c-statistic measures Hansen parameter instability test for cointegration. The Hansen tests the null hypothesis of cointegration. R^2 and SER denote R-squared and standard error of regression, respectively. loe denotes loss of employment while Δloe denotes loe in first-difference.

On the other hand, Table 5 presents the long-run and short-run models using the dynamic OLS shown in Panel A and Panel B, respectively. We estimate Equation (1) using DOLS to test the robustness of the long-run relationship between the loss of employment and the lockdown policy variables. In all cases, all the L_c-statistics suggest that the null hypothesis of cointegration cannot be rejected, suggesting long-run relationships between the loss of employment and the lockdown variables. Similarly, except for domestic travel and stay at home, the lockdown policy variables have positive impact on the number of job losses. Furthermore, the error-correction models in Panel B support the cointegration results earlier as shown by the negative and significant estimated parameters of the ecm_{t-1} terms.

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CONCLUSION

In this empirical note, we have provided evidence that the lockdown policy variables exhibit positive impact on the number of people who have lost their jobs. Is this a good or a bad thing? On the perspective of the public health safety measures, the social distancing and the lockdown efforts are good and effective strategies to contain the spreading of Covid-19 pandemic. All governments have adopted these unprecedented measures, and they are proven to be effective in reducing and containing the pandemic. On the other hand, to sustain the health of the economy, a responsible government that practices good governance would quickly enforce and engage in economic stimulus programs during the lockdown period to provide cash and liquidity to the affected firms, employers, employees and the public at large. In the context of Malaysia, the government has pumped a total of over RM290 billion into the economy through four economic stimulus package programs. . Apart from the stimulus packages initiated by the government, government agencies at all level can help policymakers to propose future policiesto further protect the labour markets in general, but more importantly are to propose policies that will protect the welfare of the affected workers whom have lost their jobs.

In the event of economic crisis or health crisis such as the Covid-19 pandemic phenomenon, it is inevitable that the labour market will be severely affected. The substantial fall in the economic growth will also be translated into higher unemployment in which people lose their jobs, and their income will be greatly reduced. One important policy implication of this study is One important policy implication of this study is that the Malaysian government should make a mandatory regulation that all workers in the private sectors as well self-employed individuals in the informal economy sectors to subscribe

to the employment insurance scheme. At present, the Social Security Organization (SOCSO) provides such scheme, but not all employers and employees are made compulsory to contribute to the employment protection scheme.

Furthermore, to help the government in such crisis more efficiently, it is importance to have timely, quality and disaggregated labour market information (LMI). Such data are critical in understanding, tracking, managing and mitigating labour market conditions that are affected from pandemic and non-pandemic consequences. To date, the EIS database only capture 79% of the total private sector employees (exclude public sector employees and foreign workers) and about 10% of non-employee workers (self-employed, unpaid family non-standard employments). Strengthening the current employment system and extending the coverage by means of mandatory employment registration is a promising strategy to improve the LMI.

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REFERENCES

Anh, D.L.T., & Gan, C. 2020. The impact of the COVID-19 lockdown on stock market performance: Evidence from Vietnam. *Journal of Economic Studies*, DOI: 10.1108/JES-06-2020-0312

Atalan, A. 2020. Is the lockdown important to prevent the COVID-19 pandemic? Effects on psychology, environment and economy-perspective. *Annals of Medicine and Surgery* 56: 38-42.

Awad, S., & Konn, A. 2020. *Socioeconomic impacts of Covid-19: Asia (Cambodia, Laos PDR, Myanmar, Philippines and Vietnam)*. CESO, Toronto, Canada.

Aziz, N.A., Othman, J., Lugova, H., & Suleiman, A. 2020. Malaysia's approach in handling Covid-19 onslaught: Report on the movement control order (MCO) and targeted screening to reduce community infection rate and impact on public health and economy. *Journal of Infection and Public Health*, https://doi.org/10.1016/j.jiph.2020.08.007

Beland, L.P., Brodeur, A., & Wright, T. 2020. *The short-term economic consequences of Covid-19 exposure to disease, remote work and government response*. IZA Discussion Paper No. 13159. IZA Institute of Labor Economics, Bonn, Germany.

Busse, M., & Hefeker, C. 2007. Political risk, institutions and foreign direct investment. *European Journal of Political Economy* 23: 397–415.

Cheng, C. 2020. *Pushed to the margins: The unequal impacts of the Covid-19 crisis on marginalized Malaysian workers*. ISIS Policy Brief Issue #7-20. Institute of Strategic and International Studies (ISIS) Malaysia, Malaysia.

Chia, R.C.J., Liew, V.K.S., & Rowland, R. 2020. Daily new Covid-19 cases, the movement control order and Malaysian stock market returns. *International Journal of Business and Society* 21(2): 553-568.

Conyon, M.J., He, L., & Thomsen, S. 2020. Lockdowns and Covid-19 deaths in Scandinavia. *Covid Economics* 26: 17-42.

Deb, P., Furceri, D., Ostry, J., & Tawk, N. 2020a. The effect of containment measures on the Covid-19 pandemic. *Covid Economics* 19: 53-86.

Deb, P., Furceri, D., Ostry, J., & Tawk, N. 2020b. The economic effects of Covid-19 containment measures. *Covid Economics* 24: 32-75.

Demir, E., Bilgin, M.H., Karabulut, G., & Doker, A.C. 2020. The relationship between cryptocurrencies and Covid-19 pandemic. *Eurasian Economic Review* 10: 349-360.

Dickey, D.A., & Fuller, W.A. 1981. Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica* 49: 1057-1077.

DOSM. 2020. *Labour Market Review, Malaysia Second Quarter 2020*. Department of Statistics Malaysia, Malaysia.

Eleftheriou, K., & Patsoulis, P. 2020. *COVID-19 lockdown intensity and stock market returns: A spatial econometrics approach*. MPRA Paper No. 10231. https://mpra.ub.uni-muenchen.de/102321/

Engle, R.F., & Granger, C.W.J. 1987. Co-integration and error correction: Representation, estimation and testing. *Econometrica* 55: 251-276.

Fana, M., Tolan, S., Torrejon, S., Brancati, C.U., & Fernandez-Macias, E. 2020. *The Covid confinement measures and EU labour markets*. Luxembourg: Publications Office of the European Union. European Union.

Ghose, A.K. 2020. The pandemic, lockdown and employment. *The Indian Journal of Labour Economics* 63(Suppl 1): S67-S71.

Gould, E., & Kassa, M. 2020. *Young workers hit hard by the Covid-19 economy: Workers ages 16-24 face high unemployment and an uncertain future*. Economic Policy Institute, Washington, D.C., USA.

Hale, T., Angrist, N., Kira, B., Petherick, A., Phillips, T., & Webster, S. 2020. *Variation in government responses to COVID-19*. Blavatnik School of Government Working Paper BSG-WP-2020/032 Version 6.0. Available: www.bsg.ox.ac.uk/covidtracker

Hansen, B.E. 1992. Tests for parameter instability in regressions with I(1) processes. *Journal of Business & Economic Statistics* 103: 321-335.

Hassan, M.K., Rabbani, M.R., & Abdullah, Y. 2020. Socioeconomic impact of Covid-19 in MENA region and the role of Islamic finance. *International Journal of Islamic Economics and Finance* 4(1): 51-78.

ILO and OECD. 2020. *The impact of the Covid-19 pandemic on jobs and incomes in G20 economies*. ILO-OECD paper prepared at the request of G20 Leaders Saudi Arabia's G20 Presidency 2020. G20 Saudi Arabia.

Ismail, R., Bachtiar, N., Osman, Z., & Noor, Z.M. 2003. Peranan buruh asing terhadap pertumbuhan output, kesempatan kerja dan upah dalam sector pembuatan di Malaysia. *Jurnal Ekonomi Malaysia* 37: 103-128.

Juranek, S., Paetzold, J., Winner, H., & Zoutman, F. 2020. Labour market effects of Covid-19: Sweden and its Scandinavian neighbours. https://voxeu.org/article/labour-market-effects-covid-19-sweden-and-its-neighbours

Kikuchi, S., Kitao, S., & Mikoshiba, M. 2020. *Heterogeneous Vulnerability to the COVID-19 Crisis and Implications for Inequality in Japan*. RIETI Discussion Paper Series 20-E-039, The Research Institute of Economy, Trade and Industry, Japan.

Kinateder, H., Campbell, R., & Choudhury, T. 2021. Safe haven in GFC versus Covid-19: 100 turbulent days in the financial markets. *Finance Research Letters*. https://doi.org/10.1016/j.frl.2021.101951

Kong, E., & Prinz, D. 2020. The impact of shutdown policies on unemployment during a pandemic. *Covid Economics*, 17, 29-50.

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P., & Shin, Y. 1992. Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? *Journal of Econometrics* 54**:**159-178.

Liew, V.K.S., & Puah, C.H. 2020. Chinese stock market sector indices performance in the time of novel coronavirus pandemic. MPRA Paper No. 100414. https://mpra.ub.uni-muenchen.de/100414/

Lin, L.L. 2020. *The socioeconomic impacts of Covid-19 in Malaysia: Policy review and guidance for protecting the most vulnerable and supporting enterprises*. International Labour Organisation, Geneva, Switzerland.

MacKinnon, J.G. 1996. Numerical distribution functions for unit root and cointegration tests. *Journal of Applied Econometrics* 11: 601–618.

Meier, M., & Pinto, E. 2020. Covid-19 supply chain disruptions. *Covid Economics* 48: 139-170.

Moosa, I.A. 2020. The effectiveness of social distancing in containing Covid-19. *Applied Economics*. https://doi.org/10.1080/00036846.2020.1789061

Newey, W.K., & West, K.D. 1987. A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica* 553: 703-708.

Ozili, P., and Arun, T. 2020. Spillover of COVID-19: Impact on the global economy. http://dx.doi.org/10.2139/ssrn.3562570

Pouliakas, K., & Branka, J. 2020. *EU jobs at highest risk of COVID-19 social distancing: Will the pandemic exacerbating the labour market divide?* IZA Discussion Paper No. 13281. IZA Institute of Labor Economics, Bonn, Germany.

Phang, D.H.B., & Narayan, P.K. 2020. Country responses and the reaction of the stock market to COVID-19 – A preliminary exposition. *Emerging Markets Finance and Trade* 56(10): 2138-2150.

Qian, M., & Jiang, J. 2020. COVID-19 and social distancing. *Journal of Public Health: From Theory to Practice*. https://doi.org/10.1007/s10389-020-01321-z

Rahman, A.A., Jasmin, A.F., & Schmillen, A. 2020. *The vulnerability of jobs to Covid-19: The case of Malaysia*. ISEAS Economics Working Paper No. 2020-09, ISEAS Yusof Ishak Institute, Singapore.

Reichelt, M., Makovi, K., & Surgsyan, A. 2020. The impact of Covid-19 on gender inequality in the labor market and gender-role attitudes. *European Societies*. https://doi.org/10.1080/14616696.2020.1823010

Shah, A.U.M., Safri, S.N.A., Thevadas, R., Noordin, N.K., Rahman, A.A., Sekawi, Z., Ideris, A., & Sultan, M.T.H. 2020. COVID-19 outbreak in Malaysia: Actions taken by the Malaysian government. *International Journal of Infectious Diseases* 97: 108-116.

Shuai, X., Chmura, C., & Stinchcomb, J. 2020. Covid-19, labor demand and government responses: Evidence from job posting data. *Business Economics* 56: 29-42.

Stock, J.H., & Watson, M. 1993. A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica* 61: 783-820.

Tang, K.H.D. 2020. Movement control as an effective measure against Covid-19 spread in Malaysia: An overview. *Journal of Public Health: From Theory and Practice*, https://doi.org/10.1007/s10389-020-01316w

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Wahab, A. 2020. The outbreak of Covid-19 in Malaysia: Pushing migrant workers at the margin. *Social Sciences & Humanities Open* 2: 100073. https://doi.org/10.1016/j.ssaho.2020.100073

Walter, D. 2020. Implications of Covid-19 for labour and employment in India. *The Indian Journal of Labour Economics* 63(Suppl 1): S47-S51.

World Bank. 2020. *Global Economic Prospects*. Washington, DC: International Bank for Reconstruction and Development/The World Bank.

Zaremba, A., Kizys, R., Aharon, D.Y., & Demir, E. 2020. Infected markets: Novel coronavirus, government interventions and stock return volatility around the globe. *Finance Research Letters*, 35, 101597. https://doi.org/10.1016/j.frl.2020.101597

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