The Relationship of Economic Freedom and Governance Quality on the Unemployment Rate in Selected Asian countries

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DOI: https://doi.org/10.37178/ca-c.21.5.043

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Abstract

Unemployment rate (UE) is always a concern in labour market view globally. This study investigates the assumption that the greater the degree of economic freedom and good governance quality, it will reduce a country's unemployment rate, ceteris paribus, for several Asian nations from the year 2002 to 2018. Static panel data analysis is applied in this study. Fixed effect model (FEM) is the most suitable model to estimate the unemployment rate in selected Asian countries. From FEM, the variables Investment Freedom and Voice and Accountability show positive relationship with unemployment rate since these variables have positive coefficients. On the contrary, the Tax Burden, Government Spending, Labour Freedom and Political Stability No Violence show negative relationship with unemployment rate. In conclusion, it is important to understand the unemployment rate in selected Asian countries because it will shape the comparative advantage and describe the situation of Asian labour market. This study provides an overview of unemployment rate using an appropriate statistical modelling known as panel data approach.

Keywords: Fixed effect model, Panel data analysis, Random effect model, Unemployment rate

Introduction

Unemployment rate (UE) is an essential factor in examining a country's macroeconomic and microeconomic performance in economic stability. One of the most essential critical indicators of the global labour market is the unemployment rate. Some Asian countries aim is to become an Industry 4.0 nation, as well as a high-income nation that is both sustainable and inclusive in the future. Several, such as Laos, Vietnam, and Cambodia, have made significant strides in the productivity and

growth of their manufacturing sectors, transitioning from an agricultural-based industry to the shift from Industry 2.0 to Industry 4.0 [1].

To transform form Industry 2.0 to Industry 4.0, the revolution in manufacturing process with reducing the costs, expanding the market which involve small group of human operations and replaced by the robotics or high technology machines such as Artificial Intelligence (AI) tools. Therefore, a systematic solution or method needs to transform the structure of the economy of a country to attain the high- income-country status. Labour market of Asian countries is an important point of view to government and private sectors, policy makers or economic researchers to refer the progress of unemployment rate. The region's structural transition has been rapid, with employment shifting from agriculture to services and industries. In terms of job sector distribution, Asia and the Pacific have seen a dramatic movement away from agricultural work to manufacturing sectors in recent decades.

Overall, Figure 1 shows the most Asia-Pacific countries' unemployment rate unchanged from year 2016 to year 2017. Countries with lower unemployment rates include New Zealand, Hong Kong (China), Japan, Taiwan (China), Vietnam, Indonesia, Philippines, and Malaysia. Japan is one of the most developed economies in the world with well-educated and dedicated workforce. In contrast, the unemployment rate in four nations increased: Singapore, the Republic of Korea, Thailand, and Macau (China). Singapore had the highest rise of 0.5 percentage points, with most layoffs in the services sector.

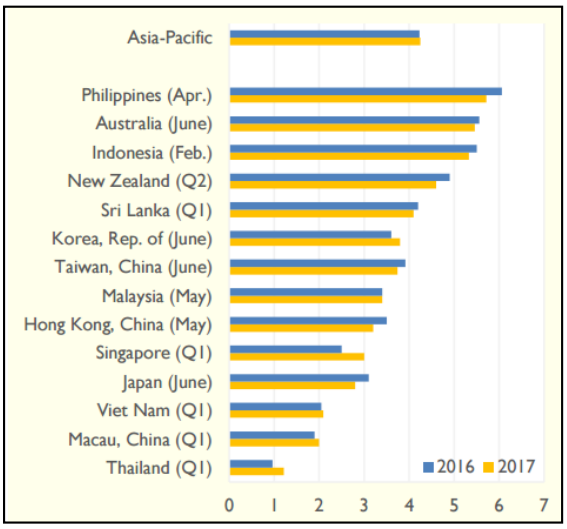

Figure **1**: The Unemployment rate, Year 2016 and 2017

Source: ILO estimates based on labour force survey data from national statistical offices; ILO: Trends Econometric Models, Apr. 2017 (forthcoming).

China, an East Asian country with the world's biggest population, experienced the Chinese Stock Market Crash in 2015. The stock market crisis had a significant influence not only on the national and global economies, but also on society. Millions of middle-class Chinese citizens lost their money because of the crisis, which lead to political instability for China's authorities. In general, any weakening of the country's GDP growth leads to fewer new jobs, lower earnings, and more young unemployment [2]. This Chinese Stock Market Crash of 2015 had a severe influence on third-party nations as well as China.

Moreover, the public health crisis can also cause a huge negative impact on the Asian countries' economy and increase the unemployment rate. The Severe Acute Respiratory Syndromes (SARS) in year 2003, Virus Subtypes H7N9 in year 2013 and Covid-19 in year 2019 have great impact on Asian countries and even international security. The SARS brought great harm to Asian countries, which was estimated loses

of USD 12-18 billion as SARS crisis depressed retail sales, tourism, airports, transport, travel, business sectors. The SARS pandemic resulted in losses ranging from USD 12.3-28.4 billion, as well as a 0.5 percent reduction in Southeast Asia and a 1% decrease in GDP in China [1]. The virus subtypes H7N9 were projected to cost the Chinese poultry sector more than RMB 40 billion. The virus is less severe than SARS and had little influence on the worldwide population.

Between year 2000 and 2017, the proportion of people working in agriculture in Eastern Asia, South-East Asia and the Pacific and Southern Asia, suffered decreases of 58, 36, and 28 percentage points, respectively. The most of agricultural job losses have been counterbalance by a rise in service sector employment, which has resulted in the creation of 740 million jobs since year 2000. Industrial employment increased in South-East Asia, the Pacific, and Southern Asia, resulting in a total gain of 108 million jobs across the region, the vast majority of which were in the construction industry [14].

Previous studies found that variety of factors or determinant variables influence a country's unemployment rate. Economic growth, unemployment, and inflation are some of the most challenging and politically sensitive economic challenges facing by policymakers throughout the world, especially in industrialized and emerging nations [3]. Several empirical studies have been done in various Asian nations to evaluate the influence of economic freedom and governance quality on unemployment rates.

The right of every individual to have access to and control over employment, labour, and property are referred to as economic freedom. Economic freedom usually used as one of the independent variables in determining the unemployment rate. According to [4] economic freedom had a significant impact on global policies and outcomes. [5] defines economic freedom as the "*degree to which a market economy is in existence, with the essential components being voluntary commerce, open competition, and protection of persons and property.*" According to the Heritage Foundation, one of the fundamental human rights is economic freedom. The Heritage Foundation created an indicator of economic freedom to assess a society's stage of economic freedom. The index focuses on four critical areas of economic activity that allow governments or the private sector to have some policy control such as regulatory efficiency, market openness, government size, and rule of law. Economic freedom is assessed using 12 qualitative and quantitative characteristics classified into four primary areas, or pillars of economic freedom.

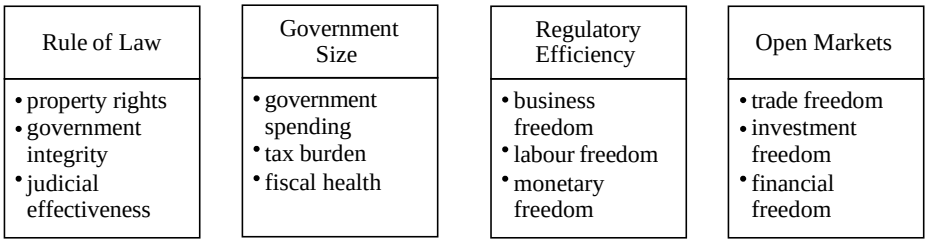

Figure **2**: Economic freedom in four primary area

A score of 0 to 100 is provided to each of the 12 economic freedoms. This data usage on this study has its own set of limitations. Due to the collection of data since 2017, certain independent variables, such as fiscal health and judicial effectiveness in the Economic Freedom Index (EFI), were missing from this study.

[6] conducted a study on the relationship of economic freedoms and unemployment rate by using the dataset for the O.E.C.D. member nations (excluding Iceland) from year 2003 until 2007. The model employed in this exploratory study, which combines a measure of tax burden, a long-term interest rate, and a measure of political stability with a measure of total economic freedom, yields estimate showing that unemployment falls as the overall average degree of economic freedom rises. [3] investigated the impact of economic freedom on unemployment by using data from 87

countries from year 1980 until 2003. The regression method was employed in this study. The results indicated that the economic freedom score is predicted to significantly reduce unemployment, particularly among female and youth. A small government sector and a legal system characterized by an independent judiciary, impartial courts, and effective property rights protection appear to be the most beneficial.

Governance and economic growth are inseparably linked. Economic growth is the public's primary focus, both in times of stability and in times of crisis [7]. [15] developed subjective survey-based governance metrics encompassing 6 aspects, which are : Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control ofCorruption. The Worldwide Governance Indicators (WGI) report on 6 aspects of governance for over 200 nations and territories from year 1996 to present.

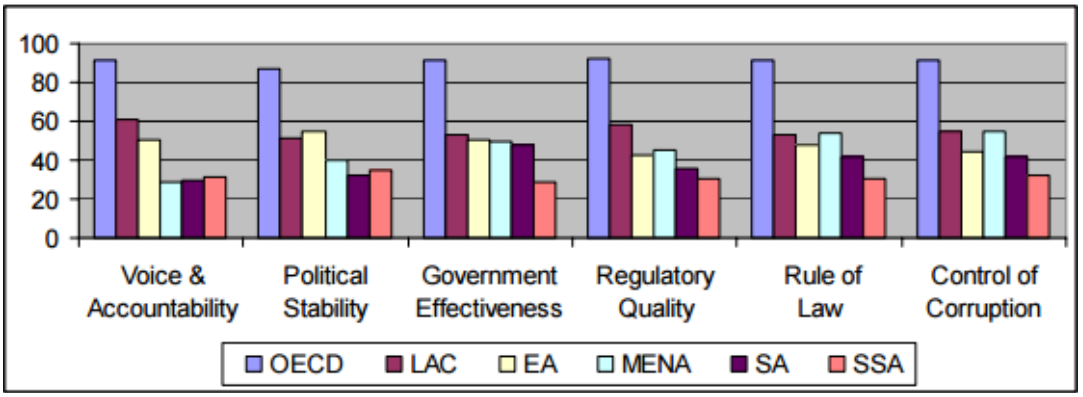

Figure **3** : Governance Indicators (2002)

Source: World Bank Governance Research Indicator Country Snapshot (GRICS), based on Kaufmann, Kraay, and Mastruzzi (2003).

Figure 3 shows the Governance indicators Year 2002 of Organization for Economic Co-operation and Development (OECD), Latin America and the Caribbean (LAC), East Asia (EA), Middle East and North of Africa (MENA), South Asia (SA) and Sub-Saharan Africa (SSA). There is mounting evidence that the quality of governance is critical to fostering economic development and productivity [8]. Using these metrics, we can see that East Asia (EA) has a higher score than South Asia (SA). While all six governance measures have been linked to economic growth, voice and accountability do not stand out as more important than the others [9].

In recent years, much research has focuses on the relationship between the Governance Quality Index and unemployment rates. [7] conducted research on the short-run and long-run relationships between economic factors and the unemployment rate in South Asian countries. To establish the long-run and short-run connection between the unemployment rate and the provided economic factors, a panel vector error correction model is employed. For the years 1994–2016, data from World Development Indicators (WDI), Worldwide Governance Indicators (WGI), and Foundation for Democracy and Sustainable Development (FDSD) were gathered. The study revealed a negative and significant link between governance, internet users, mobile cellular subscribers, fixed broadband subscriptions, and human capital with the unemployment rate in South Asian economies. Furthermore, in the granger causality test, the fixed broadband subscription and internet users revealed unidirectional causality with unemployment rate. While the governance variable revealed bidirectional causality with unemployment rate.

In a nutshell, by taking into consideration all of the elements described above, this study is noteworthy because it gives an overview of the underlying pattern and change in the unemployment rate in Asian countries. This study can give insight into how the

labour market in Asian nations may change in the future. Due to the obvious inspiration from previous research on the unemployment rate, panel data analysis methods will be utilized in this study to explore the link between economic freedom and governance quality toward the unemployment rate for chosen Asian nations. [8] & [10] pointed out that panel data analysis has tremendous ability to controlon serial correlation and heterogeneity. The findings of the study will give useful insights for policymakers, employers, and labour market in improving workforce policies and fighting labor-market problems. It is critical for policymakers to develop policies, projects, and program, particularly those focused at lowering unemployment rates in the labour sector.

Methodology

This study investigates and analyse several aspects of unemployment rate of labour market performance for Asian countries. Each of these aspects represent a different feature of the labour market for each Asian countries that together aim to provide a comprehensive understanding on the behaviour of unemployment rate respond to the countries. The data set used in this study are annual unemployment rate of selected Asian countries from year 2002 to 2018, which was collected from various sources: World Bank data, Worldwide Governance Indicators (WGI) and Heritage Index. The analysis focuses on the modelling the effect of explanatory variables on the unemployment rate in selected Asian countries.

The panel data analysis approach is suitable to estimate the model. One of the benefits of this approach is that it is the most appropriate for the control variables and reduces the risk of biased results [11]. There are three fundamental panel data models: the Pooled Ordinary Least Square model (POLS), Random effect model (REM), and Fixed effect model (FEM). POLS model is the individual effect which does not exist, yet ordinary least squares (OLS) generate efficient and consistent parameter estimations. A POLS model is shown as below.

$$y_{it} = a + \beta_1 x_{1it} + \beta_2 x_{2it} + \ldots + \beta_k x_{kit} + \varepsilon_{it} \quad \text{where } \varepsilon_{it} = u_i + \lambda_t + v_{it} \tag{1}$$

If there are no significant country or year effects, an ordinary leastsquare regression model will be applied. This model is known as a pooled regression model, and it denotes the slope estimator by β_{ols} . The ordinary least square (OLS) shows as below:

$$\hat{\beta}_{ols} = \left(X'X\right)^{-1} X'y \tag{2}$$

In POLS, the error term ε_{it} equals to sum of states different (u_i), year different (λ_t) and well-behaved problems (v_{it}). The well-behaved problems are heterogeneity and autocorrelation problem. By applying the ordinary least square method, there are no different between the countries and years; countries different (u_i) and year different (λ_t) will be assumed as zero. The Pooled OLS model is shown as below:

$$y_{it} = a + \beta_{OLS} x_{1it} + \beta_{OLS} x_{2it} + \ldots + \beta_{OLS,k} x_{kit} + v_{it} \tag{3}$$

Equation 3 illustrates that homoskedasticity (constant variances) is assumed in ordinary OLS and that there is no connection between unit i 's observations in various periods or between different units in the same period. The pooled model uses all of the errors are assumed to be similar and uncorrelated with the regressors, and it does not account for heterogeneity.

If countries effects are not zero ($u_i = 0$), the pooled model may cause heterogeneity bias and correlation between independent variables. Heterogeneity refers to the fact that the units differ from one another across the countries. To address these issues, panel data models will include the Random effect model (REM) and the Fixed effect model (FEM).

The REM also known as the error component model, is a regression with a random constant term. The REM quantify changes across time and across cross-sections. The REM is presented as below:

$$y_{it} = a + \beta_{GLS} x_{1it} + \beta_{GLS} x_{2it} + ... + \beta_{GLS,k} x_{kit} + (u_i + \lambda_t + v_{it}) \quad (4)$$

For i = 1, ..., N, and t = 1, ..., T.
where λ and u are mutually independent.

Ordinary least squares (OLS) will be ineffective if presence of autocorrelation which cause the standard error could be sub-optimal. Thus, generalized least square (GLS) will be used to solve the problem. In REM with a degree of correlation between the residuals, GLS can estimate the unknown parameters. The λ_i and u_{it} in the composite error term have variance σ^2_λ and σ^2_u respectively. The random outcome is a function with mean zero and the varianceand more crucially uncorrelated with the regressor, such as $Cor(\lambda_i, x_{it}) = 0$.

Fixed effect model (FEM) treats the error term as a variable which is partially correlated with the observed regressors. FEM is the individual specific effect that can be assumed to estimate individual specific intercepts, such as $Cor(\lambda_i, x_{it}) \neq 0$. FEM is shown as below:

$$y_{it} = (a + u_i + \lambda_t) + \beta_1 x_{1it} + \beta_2 x_{2it} + ... + \beta_k x_{kit} + v_{it} \quad (5)$$

$u_i \neq 0$, $\lambda_t \neq 0$
For i = 1, ..., N, and t = 1, ..., T.
where λ and u are mutually independent.

The FEM is more appropriate when focusing on a specific set of N Asian countries that are not chosen at random from a large population. The term of $(a + u_i + \lambda_t)$ in the FEM shows that u_i and λ_t are constant and vary between individuals.

The Lagrangian Multiplier Test (LM), the Partial F-test, and the Hausman test are 3 approaches to determine the most appropriate model. Lagrangian Multiplier (LM) Test (Breusch-Pagan, 1980) is used to test whether the variance of the unobserved individual effects is zero and test the assumptions of variances of the individual effect [16]. The Lagrange Multiplier (LM) test is a basic approach for evaluating parameter hypotheses in a likelihood framework. The hypothesis for Lagrangian Multiplier (LM) Test are:

$$H_0: \sigma^2_\lambda = 0 \quad (Pooled \quad OLS)$$
$$H_1: \sigma^2_\lambda \neq 0 \quad (Random \ effects)$$

The test null hypothesis that $\sigma_{\lambda}^{2} = 0$, which is the case where OLS is applicable and the individual effects does not exist. The LM test is easy to compute as shown below:

$$LM = \frac{NT}{2(T-1)}\left[\frac{\sum_{i=1}^{N}\left(\sum_{t=1}^{T}\hat{\varepsilon}_{it}\right)^{2}}{\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{\varepsilon}_{it}^{2}}\right] \quad (6)$$

where

N= total number of countries

T= total number of years

$\hat{\varepsilon}_{it}$ =Ordinary least square residuals

Lagrangian Multiplier is chi-square distribution freedom(*df*) equal to one. If this hypothesis is rejected, it implies that pooled OLS maynot be the best model. Next, the Partial F-test is used to examine the preference between the POLS model and the FEM. The hypothesis test is shown as below:

$H_0 : \beta_{it} = 0$ (*Pooled OLS*)

$H_1 : \beta_{it} \neq 0$ (*Fixed effects*).

If the test statistics are determined to be larger than the critical value, the null hypothesis is rejected. *F*-test is define as:

$$F = \frac{\frac{RRSS - URSS}{N-1}}{\frac{URSS}{NT-N-K}} \sim F_{(N-1),(NT-N-K)} \quad (7)$$

RRSS = restricted residual sum square (restricted model without dummy variables)
URSS = unrestricted residual sum square
N = total number of countries
T = total number of years
K = number of variables.

The Hausman test (Hausman,1978) assumes that the difference between two consistent estimators approaches zero. From a collection of fixed and random effects, the Hausman test is used to choose the optimal model. Assuming k to be the dimension of β , the Hausman statistic is given by:

$$Haus = \left(\hat{\beta}_{fe} - \hat{\beta}_{re}\right)\left[Var_{fe} - Var_{re}\right]^{-1}\left(\hat{\beta}_{fe} - \hat{\beta}_{re}\right) \quad (8)$$

where β_{fe} and β_{re} estimator as $Variance_{fe.}$ and $Variance_{re}$ in Variance-covariance matrix respectively.

The null hypothesis of regressor-effect independence states that the Hausman statistic will have an asymptotic chi-squared distribution (χ^2) with *k* degrees of freedom. If the *p*-value is less than the significant threshold, a big Hausman value suggests that the fixed effect estimator should be employed. Statistically, the Huasman test is an effective method for determining which model is best in the study. The following is the test hypothesis of the Hausman test:

$H_0 : \beta_{FE} = \beta_{RE}$ (*support Random effects*)

$H_1 : \beta_{FE} \neq \beta_{RE}$ (*support Fixed effects*)

If the result reveals that the significance level is less than 5%, the nullhypothesis is rejected and the FEM is applied; otherwise, the random effect model will be employed.

The diagnostic checking is used to identify the appropriate model component that has misspecification and is regarded as model misfit, which may have an influence on the estimations of important parameters and derived values. There are numerous diagnostic checks for the correct model, including heteroskedasticity and serial correlation. The modified Wald Statistics for Groupwise method is used to find heteroskedasticity in the model [12, 13] The hypothesis for heteroskedasticity is defined as below:

$H_0 : \hat{\sigma}_i^2 = \sigma^2$ (Homoskedasticity or constant variance)

$H_1 : \hat{\sigma}_i^2 \neq \sigma^2$ (Heteroskedasticity or not constant variance)

$i = 1, 2, \ldots, N$; where N is the number of countries

As an estimated variance of $\hat{\sigma}_i^2$, the error variance of the ith cross-sectional unit, depending on T_i residuals e_{it} accessible for that unit.

$$\hat{\sigma}_i^2 = T_i^{-1} \sum_{t=1}^{T_i} e_{it}^2 \tag{9}$$

The covariance matric is defined as:

$$V_i = T_i^{-1}(T_i - 1)^{-1} \sum_{t=1}^{T_i} \left(e_{it}^2 - \hat{\sigma}_i^2\right)^2 \tag{10}$$

By substitute the equation 9 and 10, the modified Wald Statistics is defined as:

$$W = \sum_{i=1}^{N_g} \frac{\left(\hat{\sigma}_i^2 - \hat{\sigma}^2\right)^2}{V_i} \tag{11}$$

The hypothesis is unacceptable if the p-value is less than 5% significant level. It can conclude that there is heteroskedasticity effect which is the variances are not constant in the model. Serial correlation is the relationship between a particular variable and itself over multiple time intervals. It is frequently beneficial to have a simple technique to detect serial correlation after estimating through Pooled OLS.

There are two reasons of looking for a serial correlation. First, if the model is meant to be dynamically completed in the conditional mean, serial correlation should be absent. Further, serial correlation is utilized to evaluate if a robust variance matrix estimate for the Pooled OLS estimator should be computed. The hypothesis of serial correlations specifies as below:

H_0 : no first-order autocorrelation

H_1 : first-order autocorrelation

[9] developed a novel serial correlation test method that is appealing since it may be used under general settings and is simple to execute. The technique regresses the residuals from the regression with the first-differenced variables on their lag and tests for the null hypothesis that the coefficient on the lagged residuals is equal to -0.5. If the model

indicates the heteroskedasticity and serialcorrelation problem, the assumption of OLS estimators (homoscedasticity and no serial correlation) is not met. As a rule of thumb, the covariance matrix is cluster and robust to overcome heteroskedasticity and autocorreation.

Results and Analysis

This section describes the analysis of the data that are being used in this study. There are 38 Asian countries been selected in this study; Azerbaijan, Bangladesh, Bahrain, China, Cyprus, Georgia, Hong Kong, Indonesia, India, Iran, Israel, Jordan, Japan, Kazakhstan, Kyrgyz Republic, Cambodia, Korea Republic, Kuwait, Lao PDR, Lebanon, Sri Lanka, Myanmar, Mongolia, Malaysia, Nepal, Pakistan, Philippines, Korea Democratic People Republic, Qatar, Saudi Arabia, Singapore, Syrian Arab Republic, Thailand, Tajikistan, Turkmenistan, Turkey, Uzbekistan and Vietnam from the year 2002 to 2018. Table 1 shows the list of variables and labels considered in this study.

Table 1

List of Variables and Labels for Static Panel Model Estimation

Variables	Definition	Unit measurement	Data Sources	Type of Variable
UE	Overall Unemployment rate	annually, % of labour force	World Bank Data	Dependent Variable
PR	Property Right	scale of 0 to 100	Heritage Foundation	
GI	Government Integrity			
TB	Tax Burden			
GS	Government Spending			
BF	Business Freedom			
LF	Labour Freedom			
MF	Monetary Freedom			
TF	Trade Freedom			Independent Variable
IF	Investment Freedom			
FF	Financial Freedom			
PS	Political Stability No Violence	Percentile rank term (1-100)	World Wide Governance Indicators	
GE	Government Effectiveness			
RQ	Regulatory Quality			
RL	Rule of Law			
CC	Control of Corruption			
VA	Voice and Accountability			

The overall unemployment rate of POLS model estimation is shown as below:

$$\begin{aligned} UE\_Overall_{it} &= \beta_0 + \beta_1 \ln PR_{it} + \beta_2 \ln GI_{it} + \beta_3 \ln TB_{it} + \beta_4 \ln GS_{it} + \beta_5 \ln BF_{it} \\ &+ \beta_6 \ln LF_{it} + \beta_7 \ln MF_{it} + \beta_8 \ln TF_{it} + \beta_9 \ln IF_{it} + \beta_{10} \ln FF_{it} + \beta_{11} \ln PS_{it} \quad (12) \\ &+ \beta_{12} \ln GE_{it} + \beta_{13} \ln RQ_{it} + \beta_{14} \ln RL_{it} + \beta_{15} \ln CC_{it} + \beta_{16} \ln VA_{it} + \varepsilon_{it} \end{aligned}$$

Table 2 shows overall unemployment rate model estimations. Column 1 present the variables names, follows by columns 2, 3 and 4 provide the specification of the model: Polled OLS, REM and FEM respectively. While the column 5 shows the appropriate model which is FEM with cluster robust

Table 2

Overall Unemployment Rate Model Estimations

VARIABLES	OLS	REM	FEM	FEM Cluster-Robust
Property Rights	0.2222*	-0.0637	-0.0692	-0.0692
	(0.1153)	(0.0545)	(0.0543)	(0.0543)
Government Integrity	-0.3710***	-0.0904	-0.0830	-0.0830
	(0.1380)	(0.0555)	(0.0553)	(0.0553)
Tax Burden	-0.3878	-0.2956*	-0.5902***	-0.5902***
	(0.2920)	(0.1796)	(0.1949)	(0.1949)
Government Spending	-0.8636***	-0.2973***	-0.3649***	-0.3649***
	(0.1457)	(0.0857)	(0.0876)	(0.0876)
Business Freedom	0.3155**	0.0246	0.0095	0.0095
	(0.1402)	(0.0573)	(0.0569)	(0.0569)
Labour Freedom	0.8622***	-0.2814***	-0.4107***	-0.4107***
	(0.1606)	(0.0954)	(0.0986)	(0.0986)
Monetary Freedom	0.0913	0.3017**	0.1241	0.1241
	(0.2608)	(0.1390)	(0.1459)	(0.1459)
Trade Freedom	0.4066**	-0.0226	-0.0600	-0.0600
	(0.1785)	(0.0799)	(0.0800)	(0.0800)
Investment Freedom	0.0701	0.0849***	0.0752**	0.0752**
	(0.0708)	(0.0309)	(0.0310)	(0.0310)
Financial Freedom	-0.2053*	-0.0079	0.0005	0.0005
	(0.1158)	(0.0461)	(0.0458)	(0.0458)
Political Stability No Violence	-0.0403	-0.0646**	-0.0761***	-0.0761***
	(0.0424)	(0.0293)	(0.0294)	(0.0294)
Government Effectiveness	0.1728	-0.1019	-0.1087	-0.1087
	(0.1399)	(0.0691)	(0.0694)	(0.0694)
Regulatory Quality	-0.4197***	-0.1054	-0.0648	-0.0648
	(0.1263)	(0.0763)	(0.0768)	(0.0768)
Rule of Law	-0.2160	-0.0549	-0.0387	-0.0387
	(0.1490)	(0.0656)	(0.0653)	(0.0653)
Control of Corruption	0.0691	0.0394	0.0306	0.0306
	(0.1015)	(0.0449)	(0.0449)	(0.0449)
Voice and Accountability	0.2322***	0.3289***	0.3293***	0.3293***
	(0.0575)	(0.0505)	(0.0516)	(0.0516)
Constant	1.5842***	4.0083***	6.9985***	6.9985***
	(0.5351)	(0.7580)	(1.0574)	(1.0574)
Observations	618	618	618	618
Code	38	38	38	38
R-squared	0.1818		0.1893	0.1893

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the Pooled OLS model (POLS), it shows that there are some variables which are statistically significant, such as Property Rights and FinancialFreedom are significant at level 10% significance level, Trade Freedom and Business Freedom are significant at 5% significance level, while for the Voice and Accountability, Regulatory Quality, Labour Freedom, Government Spending

and Government Integrity are statistically significant at 1% significance level. Other variables are not significant toward the unemployment rate. In POLS model, the Property Right, Labour Freedom, Trade Freedom, Voice and Accountability and Business Freedom show positive relationship with unemployment rate with the positive coefficients values. On the contrary, the Government Integrity, Government Spending, Financial Freedom and Regulatory Quality show negative relationship with unemployment rate since the variables have negative coefficients values.

REM shows that the significant variables reduce to eight variables compare to nine variables in POLS model. The significant variables such as Tax Burden is significant at 10% significant level, and Monetary Freedom and Political Stability No Violence are statistically significant at 5% significance level. Government Spending, Labour Freedom, Investment Freedom and Voice and Accountability are significant at 1% significance level. Other variables are not significant. Variables such as Voice and Accountability, Monetary Freedom, and Investment Freedom indicate a positive association with unemployment rate in the REM. However, Government Spending, Tax Burden, Labour Freedom and Political Stability No Violence show the negative relationship with unemployment rate.

For FEM, the significant variables decrease to six variables from nine variables using POLS model. The variables which are significant in this model are such as Investment Freedom is significant at 5 % significance level, while for the Tax Burden, Government Spending, Labour Freedom, Political Stability No Violence and Voice and Accountability are significant at 1% significance level. Other variables are not statistically significant. Investment Freedom and Voice and Accountability show positive relationship while the Tax Burden, Government Spending, Labour Freedom and Political Stability No Violence show the negative relationship with unemployment rate.

To choose the best model in explaining the connection between the dependent variable and the independent variable, several additional tests are conducted.

Table 3

The Most Appropriate Model for Unemployment Rate Model in Selected Asian Countries

Poolability F-test		LM-test		Hausman Test	
F-test	131.64	chi-square (χ^2)	3276.70	chi-square (χ^2)	26.82
p-value	<0.0001	*p*-value	<0.0001	*p*-value	0.0436

Firstly, the Poolability F-test is used to compare the preference between POLS model and the REM. The results of F-test value is 131.64 with *p*-value less than 0.0001. Since the *p*-value is smaller than the significance level, the null hypothesis is rejected. The FEM is more appropriate than POLS model. In other words, there are state-specific effects (heterogeneity) in the data.

Next, the Breusch and Pagan Lagrangian Multiplier test is proceeded tocompare goodness of fit between the Pooled OLS model and REM. The results of chi- square (χ^2) test statistics is 3276.70 and the *p*-value is less than 0.0001. Since the *p*-value is smaller than significant level, so the null hypothesis is rejected. The REM is more suited than the POLS model. In short, the data contains state-specific effects (heterogeneity). Next, the Hausman test is proceeded to compare goodness of fit between the REM and FEM. The result of chi-square (χ^2) value is 26.82 and the *p*-value is 0.0436. Since the chi-square (χ^2) value is more than significant level of 5% and 10%, the null hypothesis is rejected because the model fitted to these data fails to

fulfil the Hausman test's asymptotic requirements. The FEM is better than the REM in this case. Since the FEM is selected as an appropriate model, various diagnostic checks areperformed. The heteroskedasticity test and serial correlation test are shown in Table 4.

Table 4

Diagnostic checks for Most Appropriate Model Countries

Modified Wald test for groupwise heterosekedasticity	
chi-square (χ^2)	14802.69
p-value	<0.0001
The Wooldridge test for autocorrelation	
F-test (1, 37)	30.195
p-value	< 0.0001

Table 4 shows the Modified Wald test for groupwise heteroskedasticity in fixed effect regression model. The result of chi-square (χ^2) value is very large with p-value is small. Thus, the null hypothesis is rejected. The result shows that variances are not equal and heteroskedasticity problem exist. Next, to check and fitting the model with first-order autocorrelation the Wooldridge test is carried out. The result shows significant p-value, the null hypothesis is rejected, and it can be concluded that there is a serial correlation problem in that first-order autocorrelation in panel data. Since the FEM indicates the heteroskedasticity and serial correlation problem, the FEM must rectify by using the panel-robust estimates in column 5 in Table 2. FEM with panel-robust and cluster estimates in column 4 shows the similar significant variables with FEM in column 3.

Conclusion

In conclusion, the best suited model for overall unemployment rate is the Fixed Effect Model with Panel-Robust and Cluster. This model has also taken into consideration of overcoming the heteroskedasticity and serial correlation problems. The Investment Freedom and Voice and Accountability variables show positive relationship with overall unemployment rate. Meanwhile, the Tax Burden, Government Spending, Labour Freedom and Political Stability No Violence show the negative relationship with overall unemployment rate.

Theoretically more freedom of people on controlling their lives, stable governance, good management on government spending on education, technological, military, medical and healthcare system and others will lead to reducing the unemployment rate in each nation. It is a precondition for economic growth and low unemployment rate, social stability, and the legal system in a country. Based in the empirical findings of this study, there are few major policy implications in labour market that can be suggested. Firstly, government may increase the education or labour force training expenditure to overcome the occupational immobility and improve the skill for by the labour force. Secondly, increasing the tax burden on employer but reducing tax for employee to boost the aggregate of demand. Furthermore, increasing the labour freedom in aspect of minimum wages, law, or legal regulatory framework to encourage firms to take on the long-term unemployed and reduce the real wage unemployment rate. The government could also increase the spending on geographical subsidies to encourage firms to invest in underserved areas, thereby increasing job opportunities for local workers. In short, international organisations' efforts to persuade governments to reform their labour market institutions should consider the stability of a political systems. More unstable and polarized systems are likely to face greater resistance to labour market institution reform. For future research, model can be easily extendable to other countries. The cross-policy study

study of various nations also be another direction to extend this study. The findings of this study can be used as a guideline of a preliminary analysis on factors contributing to unemployment in Asian countries. It can be extended by adding more years and variables for a more comprehensive analysis.

Acknowledgements

Special thanks to Department of Statistics of Malaysia (DOSM) for providing labour force data to this study. Acknowledgement to Ministry of Higher Education Malaysia for Fundamental Research Grant Scheme with Project Code: FRGS/1/2018/STG06/USM/02/12.

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