APPLICATION OF LEAST SQUARE DUMMY VARIABLE (LSDV) IN ESTIMATION OF UNEMPLOYMENT RATE FOR SELECTED ASIAN COUNTRIES

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Abstract:

Least Square Dummy Variable (LSDV) regression model was employed in this study to investigate the compensation of the unemployment rate. The data used in this study were secondary data source of governance quality and economic freedom the from World Governance Index (WGI) and Heritage Foundation respectivthe ely from year 2002 until 2018. The variables considered were unemployment rate as the dependent variable, governance quality and economic freedom index as independent variables. The panel is subject to the Fixed effects with LSDV (FEM LSDV) model. The results obtained indicate that overall, male and female unemployment rate has the countries dummies effect with no time dummies effect. The overall, male and female unemployment FEM LSDV with countries dummies effect shows the R^2-va,lue 0.9151, 0.9136 and 0.9072 respectively indicating that 91.51%, 9,1.36% and 90.7the 2% of total variation was accounted for by independent variables. The empirical results are valuable to policymakers of Asian countries in understanding the trends, patterns and effects of economic freedom, governance quality toward their unemployment rate.

Keywords least square dummy, Fixed effect model, LSDV, panel data, the unemployment rate

1. Introduction

Unemployment is a worldwide issue that occurs not only in developing countries but also in developed countries. This is due to the fact that unemployment is an important component of development, especially economic development [1]. According to the International Labour Organization (ILO), individuals in unemployment are defined as those who are of working age (15 years or older) and who have engaged in efforts to seek and obtain work over a given recent time but are currently unemployed. In recent years, academics have paid closer attention to the non-economic drivers of growth rate [2]. Unemployment rate is a crucial significant instrument for economic policy [3]. Reference [4] stated that there are no unemployment benefits or social schemes to be claimed because most jobless individuals cannot afford to be unemployed for an extended period of time. The unemployment rate is the percentage of the unemployed people to the overall labour force population. This rate calculates the proportion of the labour force that is unemployed. It is defined as:

$$\text{Unemployment rate} = \frac{\text{No. of unemployed persons}}{\text{No. of persons in the labour force}} \times 100 \tag{1}$$

Economic Freedoms is one of the independent variables toward the unemployment rate.

Reference [5] said that economic freedom has had a major impact on global policies and results. According reference [6], the basic structure is based on the fundamental premise of unemployment rate.

$$\text{UnemploymentRate}_{it} = f\left(\text{EconFreedom}_{ijt}, \text{Other}_{ijt}\right), f_{UnemploymentRate_{ijt}} < 0 \qquad (2)$$

Researchers have been debating the notion of governance in recent years. Governance and economic growth are inextricably intertwined. Economic growth is the primary preoccupation of the general population both during times of stability and during times of crisis [7]. Reference [8] developed subjective survey-based governance metrics encompassing six aspects. Governance is made up of the traditions and structures that allow a country's authority to be exercised. This includes how governments are chosen, monitored, and replaced; the government's capacity to formulate and implement rational policies and people's and the state's respect for the institutions that regulate economic and social interactions. The Worldwide Governance Indicators (WGI) reported on six main features of governance for over 200 nations and territories from year1996 until now.

In recent years, labour force employment becomes a debated issue of public and privates sectors due to the development of the economic sector in each country. It is important to determine the determinant variables of labour force that affect the unemployment rate for a country. It is also important to know and understand the patterns and changes of unemployment rate in selected Asian countries. For instance, reference [9,10,11,12,13,14,15], and etc. studied different factors or determinants of labour force that affecting the unemployment rate for Asian countries. Societies in Asia have experienced dramatic and rapid changes in their economic, social and political spheres in the past few decades. Given the wide diversity, it is understandable that the manifestation, extent and impact of these changes vary from country to country [16].

Recently, panel analysis on unemployment rate has received a lot of attention using statistical approach. Panel data also known as cross sectional time series data or longitudinal data where multiple cases are determined at two or more time period. Panel data is classified into two types: balanced panel data and unbalanced panel data. Each participant has an equal amount of observations in the balance panel data (cross-section). Unbalanced panel data does not have an equal amount of observations for each individual. In the case of control variables, panel data are preferable to OLS or time series because panel data imply that nations or states are diverse. However, because time series and OLS do not account for such variability, the risk of generating biased findings increases [17]. In panel data analysis, the term Fixed effects estimator, also known as the within estimator is used to refer to an estimator for the coefficients in the regression model. Fixed effects models have been applied to social and economic problems [18,19,20,21]. In short, the literature and prior research demonstrate that economic freedoms, economic indicators, and labour market variables in a country vary with time, and they have an influence on a country's unemployment rate. In recent years, labour force employment becomes a debated issue of public and privates sectors due to the development of the economic sector in each country. It is important for us to determine the

economic freedoms and governance quality that affect the unemployment rate for Asian countries.

2. Theoretical Framework

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 $Cor(\lambda_t, x_{it}) \neq 0$. The model of Fixed effect is shown as below:

$$
\begin{aligned}
& y_{it} = \left(a + u_i + \lambda_t\right) + \beta_1 x_{1it} + \beta_2 x_{2it} + ... + \beta_k x_{kit} + v_{it}, \\
& \text{where } u_i \neq 0, \ \lambda_t \neq 0, \ u_i \ \square \ \left(0, \sigma_\mu^2\right), \ \ \lambda_t \ \square \ \left(0, \sigma_\lambda^2\right), \\
& \text{For } i = 1, ..., N, \text{ and } t = 1, ..., T, \\
& \lambda \text{ and } \mu \text{ are mutually independent.}
\end{aligned}
\tag{3}
$$

This estimation is equivalent to the transformation for each variable by subtracting the cross-section mean. The equation is shown as below:

$$
\begin{aligned}
\tilde{y}_{it} &= y_{it} - \bar{y}_{it} \\
&= \left(\beta_0 - \bar{\beta}_0\right) + \beta_1 \left(x_{1it} - \bar{x}_{1it}\right) + \beta_2 \left(x_{2it} - \bar{x}_{2it}\right) \\
&\quad + ... + \beta\left(x_{kit} - \bar{x}_{kit}\right) + v_{it} \\
&\text{where } \beta_0 = a + u_i + \lambda_t
\end{aligned}
\tag{4}
$$

Equation 4 shows a transformation which is called as within transformation or within estimator, because the model uses the within variations through in time. Since this Fixed effect estimator is based on within-time variation, it is impossible to identify the effects of variables that do not vary over time. Another option for finding the unobserved impact is using the Least squares dummy variables Fixed effect model (LSDV FEM). The coefficient of the individual-specific dummy variables is considered as LSDV FEM, (D_i), which equals to 1 (an observation is relating to individual i) and equal to 0 (an observation is not relating to individual i). FEM frequently has too many cross-sectional units of the observations in the data set and requires many dummy variables for their specification. Assuming that FEM residuals are normally distributed and homogeneous, countries-specific (group wise) heteroskedasticity or autocorrelation across time can readily plague estimation. Furthermore, the incremental F test is used to evaluate FEM, variances of the error term is constant and intercept is varied across group (countries) or times period (years). Generally, the LSDV FEM can be written as:

$$
y_{it} = \sum_{j=1}^{n} \beta_j x_{it} + \sum_{i=0}^{n} a_i D_{i.state} + \sum_{k=i}^{n} \gamma_i D_{i.year} + \varepsilon_{it}
\tag{5}
$$

In the analysis, we used a regression model with i - 1 nation factors and t - 1 time factors. For example, the model could be described as follows:

$$Y_{it} = \alpha_0 + \alpha_1 country_1 + ... + a_{38} country_{38}$$
$$+ \alpha_1 Year_1 + ... + a_{38} Year_{38} + \beta_1 X_{it} \qquad (6)$$
$$+ ... + \beta_n X_{it} + \varepsilon_{it}$$

To investigate the time effect or the country effect is necessary, F-test is used. The hypothesis test for LSDV FEM individual dummies is as follow:

$H_0 : u_1 = u_2 = ... = u_N$

$H_1 : at\ least\ one\ u_i\ not\ equal$

Meanwhile, the F-test statistic is described as follows:

$$F = \frac{\frac{RRSS - URSS}{N-1}}{\frac{URSS}{NT-N-K}} \square\ F_{(N-1),(NT-N-K)} \qquad (8)$$

Where

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 variable

3. Analytical Framework

Least Square Dummy Variables (LSDV) is used to test whether all countries can share the same intercept. This section includes the countries or time (years) dummy variables on the Pooled OLS Model of Overall unemployment rate, Male unemployment rate and Female unemployment rate model. Pooled OLS model are model with no unique attributes of individuals within the measurement set as well as and no universal effects across the time. Pooled OLS Model can be used to derive unbiased and consistent estimates of parameters. The least square dummy variables is included in this model. In this study, we wish to test the panel models where the slope coefficients are constant, but the intercept varies over the countries as well as time. The regression model includes i-1 countries dummies and t-1 time dummies. The Least Square Countries Dummies model could be specified as follows:

$$Y_{it} = \alpha_0 + \alpha_1 country_1 + \alpha_2 country_2 + ... + \alpha_{38} country_{38} + \beta_1 X_{it} + ... + \beta_n X_{it} + \varepsilon_{it} \qquad (9)$$

The Least Square Years Dummies model could be specified as follows:

$$Y_{it} = \gamma_0 + \gamma_1 Year_{2002} + \gamma_2 Year_{2003} + ... + \gamma_{14} Year_{2018} + \beta_1 X_{it} + ... + \beta_n X_{it} + \varepsilon_{it} \qquad (10)$$

The sample data consists of 38 selected Asian countries from 2002 until 2018 to reflect the times or countries effect on unemployment rate by employed the static panel FEM LSDV. Table 1 shows the mean, standard deviation, minimum and maximum of each variable used in this study. Each variable is recorded by STATA software in three various descriptions of

descriptive statistics for panel data of Unemployment rate: overall, between and within. Overall statistics are conventional statistics that are based on data observations. "Between" descriptive statistics are determined on the basis of summary statistics of 38 countries of Asian regardless of the number of years. While, the "Within" descriptive statistics by summary statistics is determined of 17 years regardless of the number of countries. Descriptive statistics is summarizing the data to be easily understood.

Based on the Table 1 shows the mean of Overall unemployment rate is 5.373367. The "Overall" standard deviation is 3.978456 with the minimum value (min) equal to 0.11 and maximum value (max) equal to 20.17. "Between" standard deviation of overall unemployment rate equal 3.78605 with the minimum value (min) equal to 0.6339412 and maximum value (max) equal to 16.06682. "Within" standard deviation of overall unemployment rate equal 1.359968 with the minimum value (min) equal to 0.4533082 and maximum value (max) equal to 13.24331. Next, the mean of male unemployment rate is 5.072028. The "Overall" standard deviation is 3.970213 with the minimum value (min) equal to 0.052 and maximum value (max) equal to 22.433. "Between" standard deviation of male unemployment rate equal 3.746071 with the minimum value (min) equal to 0.3504706 and maximum value (max) equal to 17.52612. "Within" standard deviation of male unemployment rate equal 1.441406 with the minimum value (min) equal to -0.9720897 and maximum value (max) equal to 14.02532.

Furthermore, Table 1 shows the mean of female unemployment rate is 6.810641. The "Overall" standard deviation is 5.924093 with the minimum value (min) equal to 5 and maximum value (max) equal to 98.4. "Between" standard deviation of female unemployment rate equal 5.781909 with the minimum value (min) equal to 10.12941 and maximum value (max) equal to 90.91176. "Within" standard deviation of female unemployment rate equal 1.579141 with the minimum value (min) equal to 25.06966 and maximum value (max) equal to 74.64613.

Table 1: Descriptive Statistics Dependents and Independents variables

Variables		Mean	Std. Dev.	Min	Max
Overall Unemployment Rate	Overall	5.373367	3.978456	0.11	20.17
	Between		3.78605	0.6339412	16.06682
	Within		1.359968	0.4533082	13.24331
Male Unemployment Rate	Overall	5.072028	3.970213	0.052	22.433
	Between		3.746071	0.3504706	17.52612
	Within		1.441406	-0.9720897	14.02532
Female Unemployment Rate	Overall	6.810641	5.924093	5	98.4
	Between		5.781909	10.12941	90.91176
	Within		1.579141	25.06966	74.64613
Property Right	Overall	3.050435	22.93888	5	98.4
	Between		22.02204	10.12941	90.91176
	Within		7.297407	25.06966	74.64613
Government Integrity	Overall	3.166752	20.23392	4	94
	Between		19.46983	9.282353	91.41176
	Within		6.304009	17.52709	65.30356

Tax Burden	Overall	42.13994	16.88855	0	99.9
	Between		16.34157	0	99.71765
	Within		4.980037	40.31734	91.21734
Government Spending	Overall	-1.348654	19.72736	0	98.7
	Between		18.8146	0	93.47059
	Within		6.630295	39.79272	95.89272
Business Freedom	Overall	-.981804	18.24111	0	100
	Between		16.69505	10.29412	97.35882
	Within		7.805605	39.18375	35.47214
Labour Freedom	Overall	6.946141	18.97728	0	100
	Between		17.4839	.8823529	96.04706
	Within		7.876107	35.47214	105.2192
Monetary Freedom	Overall	6.872325	15.17888	0	94.3
	Between		14.21741	0	88.91176
	Within		5.76869	41.42895	89.04071
Trade Freedom	Overall	8.819892	17.53258	0	95
	Between		15.52374	0	90.88235
	Within		8.507796	18.14783	93.91254
Investment Freedom	Overall	8.634127	22.92297	0	90
	Between		21.26801	4.705882	90
	Within		9.184485	7.662539	70.60372
Financial Freedom	Overall	8.270817	21.41752	0	90
	Between		19.45521	5.294118	86.47059
	Within		9.465419	-12.87926	91.82663
Political Stability No Violence	Overall	8.629533	25.47072	0	99.04762
	Between		24.32666	2.680717	92.7777
	Within		8.464716	4.715145	81.73426
Government Effectiveness	Overall	8.525795	27.00713	0.4739336	100
	Between		26.66594	1.562691	98.99912
	Within		5.996003	12.8878	70.78764
Regulatory Quality	Overall	7.475527	27.63424	0	100
	Between		27.39534	0.4106839	99.31184
	Within		5.635908	4.891938	66.63645
Rule of Law	Overall	43.35342	26.97822	.9569378	97.11539
	Between		26.74033	4.601218	93.39908
	Within		5.524178	11.19836	62.23981
Control of Corruption	Overall	40.57923	28.38871	.4739336	99.03846
	Between		27.94769	3.599038	97.73163
	Within		6.649885	-11.59372	71.23963
Voice and Accountability	Overall	30.71225	23.39678	0	84.97652
	Between		23.238	0.1704125	81.05083
	Within		4.560744	14.77605	54.11521

4. Results and Discussion

This study illustrates the relationship between the Economic Freedom and Governance quality with unemployment rate in Asian countries. The World Bank, Governance Index, and Heritage Index were among the sources used to compile data on the annual unemployment

rate of selected Asian countries from 2002 to 2018. The data which is carried out annually provides statistics of unemployment rate, economic freedoms index (EFI), governance quality and labour market determinants. The results show that Fixed effect model (FEM) is the most appropriate model to represent the overall, male and female unemployment rate model. From the results, we applied the Least Square Countries and Times Dummy on the model to investigate the significance of countries effects or times effects on the model.

Table 2: Fixed effect model with Least Square Countries Dummy Variables of Overall, Male and Female Unemployment rate

Variables and Countries Dummy Variables	Overall UE Rate	Male UE Rate	Female UE Rate
Property Rights	-0.0692	-0.0577	-0.0835
	(0.0543)	(0.0620)	(0.0576)
Government Integrity	-0.0830	-0.0777	-0.0866
	(0.0553)	(0.0632)	(0.0586)
Tax Burden	-0.5902***	-0.6389***	-0.4154**
	(0.1949)	(0.2227)	(0.2067)
Government Spending	-0.3649***	-0.2866***	-0.4296***
	(0.0876)	(0.1001)	(0.0929)
Business Freedom	0.0095	0.0034	0.0277
	(0.0569)	(0.0651)	(0.0604)
Labour Freedom	-0.4107***	-0.3395***	-0.4995***
	(0.0986)	(0.1127)	(0.1046)
Monetary Freedom	0.1241	0.2383	-0.0426
	(0.1459)	(0.1667)	(0.1547)
Trade Freedom	-0.0600	-0.0911	-0.0012
	(0.0800)	(0.0914)	(0.0848)
Investment Freedom	0.0752**	0.0616*	0.0953***
	(0.0310)	(0.0354)	(0.0328)
Financial Freedom	0.0005	-0.0017	-0.0073
	(0.0458)	(0.0524)	(0.0486)
Political Stability No Violence	-0.0761***	-0.0614*	-0.1190***
	(0.0294)	(0.0336)	(0.0312)
Government Effectiveness	-0.1087	-0.0884	-0.1757**
	(0.0694)	(0.0793)	(0.0736)
Regulatory Quality	-0.0648	-0.1003	-0.0203
	(0.0768)	(0.0877)	(0.0814)
Rule of Law	-0.0387	-0.0415	-0.0142
	(0.0653)	(0.0747)	(0.0693)
Control of Corruption	0.0306	0.0085	0.0602
	(0.0449)	(0.0513)	(0.0477)
Voice and Accountability	0.3293***	0.3507***	0.3228***
	(0.0516)	(0.0589)	(0.0547)
Bangladesh	-0.9276***	-1.1005***	-0.5715***
	(0.1375)	(0.1571)	(0.1458)
Bahrain	-1.6715***	-2.7158***	-0.5605***
	(0.1272)	(0.1454)	(0.1349)
China	-0.0553	0.1461	-0.2265*
	(0.1287)	(0.1470)	(0.1365)
Cyprus	-0.3884**	-0.3416**	-0.3908**
	(0.1510)	(0.1725)	(0.1601)

Georgia	0.7121***	0.8906***	0.4958***
	(0.1265)	(0.1445)	(0.1341)
Hong Kong, China	-0.2905*	-0.1079	-0.4996***
	(0.1537)	(0.1756)	(0.1629)
Indonesia	-0.5908***	-0.5634***	-0.5990***
	(0.1376)	(0.1573)	(0.1459)
India	-0.6597***	-0.5843***	-0.7377***
	(0.1510)	(0.1725)	(0.1601)
Iran, Islamic Republic	0.4285**	0.3556	0.8399***
	(0.1952)	(0.2231)	(0.2070)
Israel	-0.6994***	-0.5493***	-0.8135***
	(0.1750)	(0.1999)	(0.1855)
Jordan	0.6695***	0.6231***	1.1044***
	(0.1216)	(0.1389)	(0.1289)
Japan	-0.8298***	-0.7171***	-0.9012***
	(0.1529)	(0.1748)	(0.1622)
Kazakhstan	0.2193**	0.1145	0.3469***
	(0.1068)	(0.1221)	(0.1133)
Kyrgyz Republic	0.0349	0.0158	0.0773
	(0.1160)	(0.1325)	(0.1229)
Cambodia	-2.3052***	-2.3273***	-2.2870***
	(0.1278)	(0.1460)	(0.1355)
Korea, Republic	-1.0460***	-0.8949***	-1.1990***
	(0.1519)	(0.1735)	(0.1610)
Kuwait	-1.2841***	-1.6447***	-0.6860***
	(0.1300)	(0.1486)	(0.1379)
Lao PDR	-1.7743***	-1.6520***	-1.8495***
	(0.1185)	(0.1354)	(0.1256)
Lebanon	-0.3159**	-0.3542**	-0.0922
	(0.1273)	(0.1454)	(0.1350)
Sri Lanka	-0.3816***	-0.6254***	-0.0350
	(0.1261)	(0.1441)	(0.1337)
Myanmar	-2.0146***	-2.0452***	-1.9551***
	(0.1651)	(0.1887)	(0.1751)
Mongolia	-0.5390***	-0.4003***	-0.6628***
	(0.1307)	(0.1493)	(0.1386)
Malaysia	-0.6298***	-0.6042***	-0.5911***
	(0.1247)	(0.1424)	(0.1322)
Nepal	-1.8688***	-1.6195***	-2.1858***
	(0.1377)	(0.1573)	(0.1460)
Pakistan	-2.2539***	-2.1364***	-2.5507***
	(0.1437)	(0.1642)	(0.1524)
Philippines	-1.0998***	-1.0554***	-1.1315***
	(0.1389)	(0.1587)	(0.1473)
Korea, Dem. People Rep.	-6.1918***	-5.2487***	-6.7607***
	(1.0457)	(1.1948)	(1.1087)
Qatar	-2.4334***	-3.1501***	-1.0513***
	(0.1325)	(0.1514)	(0.1405)
Saudi Arabia	0.5276***	0.1886	1.4923***
	(0.1399)	(0.1599)	(0.1484)
Singapore	-0.0792	-0.0894	-0.0153
	(0.1507)	(0.1722)	(0.1598)
Syrian Arab Republic	0.3666**	0.1078	1.1921***
	(0.1434)	(0.1638)	(0.1520)

Thailand	-2.0675***	-1.9446***	-2.1914***
	(0.1241)	(0.1418)	(0.1316)
Tajikistan	0.5947***	0.7472***	0.3864***
	(0.1150)	(0.1313)	(0.1219)
Turkmenistan	0.1209	0.4320**	-0.4008**
	(0.1910)	(0.2182)	(0.2025)
Turkey	-0.1053	0.0119	-0.1881
	(0.1493)	(0.1706)	(0.1584)
Uzbekistan	0.3264*	0.4287**	0.2654
	(0.1678)	(0.1917)	(0.1779)
Vietnam	-1.0602***	-0.9888***	-1.0719***
	(0.1189)	(0.1358)	(0.1260)
Constant	7.7035***	6.8790***	8.1313***
	(1.0752)	(1.2285)	(1.1400)
Observations	618	618	618
R-squared	0.9151	0.9136	0.9072

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

Postestimation Wald tests is used to test whether all the countries considered can share the same intercept. For the country-effect hypothesis:

H_o : There is no country-effect

H_1 : There is a country-effect

Based on Table 3, for overall, male and female unemployment rate LSDV for different country shows the F-value 131.64, 125.00, and 113.68 respectively with the p-values are equal to less than 0.001. Since the p-value is smaller than significant level, so the null hypothesis is rejected. Thus, all countries have different intercept.

Table 3: Postestimation Wald tests of Countries-effect

Unemployment rate	Post estimation Wald tests	
Overall	F-test (37, 564)	131.64
	p-value	0.0000
Male	F-test (37, 564)	125.00
	p-value	0.0000
Female	F-test (37, 564)	113.68
	p-value	0.0000

In short, the overall, male and female unemployment rate models have country dummies effect. For all models show that the countries dummies effect (Specific Effect for LSDV) dummies which are significant at 1% significance level. The intercept is cross-section (group) specific and in this case differs from one countries to another. For overall unemployment rate model, it shows that all selected Asian countries show have different intercept between the selected countries except Kyrgyz Republic, Lebanon, Sri Lanka, Singapore and Uzbekistan. For male unemployment rate model shows all selected Asian countries have different

intercept between the selected countries except Turkey, Syrian Arab Republic, Singapore, Saudi Arabia, Kyrgyz Republic, Kazakhstan, Iran Islamic Republic, Hong Kong and China. Further female unemployment rate model shows all selected Asian countries have different intercept between the selected countries except Kyrgyz Republic, Lebanon, Sri Lanka, Singapore, Turkey and Uzbekistan.

Next, the Least Square Years Dummies model could be specified as follows. For the Years-effect hypothesis:

$$H_o : \text{There is no time-effect}$$

$$H_1 : \text{There is a time-effect}$$

Table 4: Post estimation Wald tests of Years-effect

Unemployment rate	Post estimation Wald tests	
Overall	F-test (16, 585)	0.43
	p-value	0.9747
Male	F-test (16, 585)	1.03
	p-value	0.9988
Female	F-test (16, 585)	0.80
	p-value	0.6850

The overall unemployment rate LSDV based on time shows small F-value with p-value equal to 0.9747. Since the p-value is large, the null hypothesis is not rejected. Thus there is no time-effect in overall unemployment rate model. The same findings were found for male and female unemployment rate LSDV with time dummies where the null hypothesis were not rejected for both cases. Thus there is no time-effect female unemployment rate model. In short, the overall, male and female unemployment rate models do not have time dummies effect (Specific Effect for LSDV dummies).

5. Conclusion

To conclude, the least square dummy variable regression model (LSDV) accounts for heterogeneity by enabling each country to have a unique intercept value. The LSDV might be attributed to certain unique characteristics of each sector, such as management style, policies, and programmes, or the labour market. In short, overall unemployment rate, male unemployment rate and female unemployment rate have the countries effect. The government of selected Asian countries must put measures in place to ensure unemployment rate of overall, male and female are decreasing. By referring the results in Table 2, economic policy makers in overall UE model for China, Kyrgyz Republic and Singapore; male UE model for China, Hong Kong (China), Kazakhstan, Kyrgyz Republic, Saudi Arab, Singapore and Syrian Arab Republic; and female UE model Kyrgyz Republic, Lebanon, Sri Lanka, Singapore, Turkey and Uzbekistan should structurally transform their labour market policy to reduce the

unemployment rate due to the immense negative impact that it has on annual percentage change in economic freedom and governance quality of a nation.

However, this study have some 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. Theoretical, this will have the influential effect on the outcome. Moreover, due to a lack of data, this study was limited to a subset of the used geographical units (locations) and time periods. In conclusion, this study is important to recognize the relationship of the explanatory variables with the unemployment rate of Asian countries, involving in the application of the data.

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