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Assessing Youth Unemployment Rate in Malaysia using Multiple Linear Regression

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Abstract: This study investigated the relationship between urbanization, inflation, gross domestic product and foreign direct investment towards youth unemployment in Malaysia. As youth unemployment has been increasing over the past decade, it is therefore crucial to decide which variables are the most critical in affecting Malaysia's youth unemployment rate as to ensure sustainable economic growth in the country. Data was obtained from Department of Statistics Malaysia and World Bank websites. Descriptive and multiple linear regressions were used in this study. The outcome revealed that foreign direct investment and gross domestic product growth are significant factors, while urbanization and inflation showed insignificant relationship towards the contribution to the youth unemployment rate.

Keywords: Malaysia, regression, sustainability, youth unemployment

1 Introduction

Unemployment issue is a prevalent concern in every country, including those in the developed countries. Failure to address unemployment issues will hinder sustainable efforts for the country, in particular the economic growth, as well as socio-economic threats related to high unemployment rate. The direct effects of unemployment towards individual includes the deteriorating quality of personal well-being and health (Voßemer, Gebel, Täht, Unt, Högberg, & Strandh, 2018). Eita & Ashipala (2010) reported that unemployment is directly linked to poorness, homelessness, and family bonding affects. These undesirable effects may result in putting pressure in the society, with severe criminal cases may arise, including criminal violence, prostitution, and alcohol abuse, apparently will break down family institution. Jones (1988) also highlighted the affect to children, as they may be denied quality education due to financial constraint faced by the breadwinner in the family. While failure to respond to this concern will submit to the breeding ground for violence and terrorism activity in the society (Evans & Kelikume (2019).

Unemployment occurs when there are more job-seekers than job availability. There are three significant unemployment categories: the structural, cyclical, and frictional (Raphael Zeder, 2019). Structural unemployment issues occur when there exists a contrast in the skill set delivered by laborer and the skills needed by employers. When workers remained jobless for a long time, their knowledge and expertise may become out-of-date. It could be difficult for them to search for a new job. Cyclical unemployment refers to situation when the economy experiences recession, resulting to the affected firms to cut down its production. This will consequently decreased demand for labor. Whereas, frictional unemployment attributes to employees who resign from their previous jobs but still haven't found new ones. This occurrence normally for cases where employees resign from their current position and look for better job offerings.

In Malaysia, the rate of unemployment increases at the highest in more than three decades of 5.3% in May 2020, affecting 826,100 individuals, in response to the Covid-19 that has stalled productivity

since the beginning of the year (theedgemarkets, 2021). The trend is improving towards the end of the year, in which the Department of Statistics reported of a 4.7% unemployment rate in August 2020.

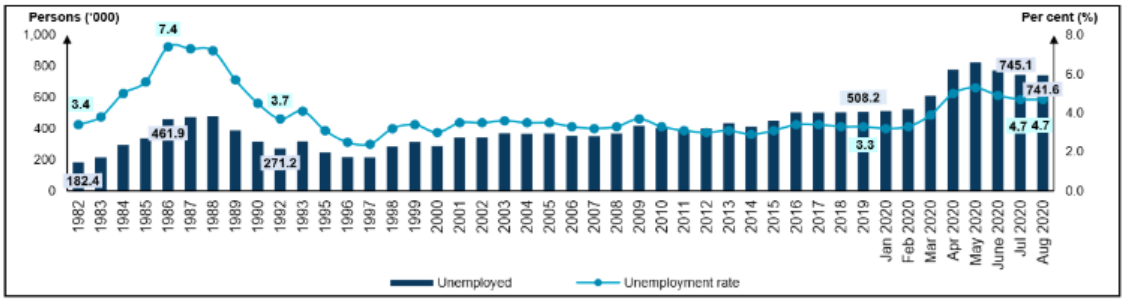

Figure 1: Unemployed persons and unemployment rate, 1982 - 2019 and January - August 2020 (Source: Department of Statistics)

However, in the span of the previous decade, the rate of youth unemployment rate in Malaysia is increasing. Youth is one of the vulnerable groups which have been impacted negatively by the crisis. In previous recessions, youth have lost jobs more severely than average, experiencing higher unemployment cases remarkably after the recessions of 1997-1998 and 2008-2009 (Cheng & Welsh, 2020). In 2019, the young people's unemployment rate in Malaysia, at 11.26% officially, is three times more than the national rate of 3.4 percent. The levels of youth unemployment, a huge gap relative to the national unemployment rate, reflect the severity of the issue (Lee, 2020). In the latest development, in August 2020, 8.9% (15 – 30 years), and 13.7% (15 – 24%) are the current youth unemployment in Malaysia.

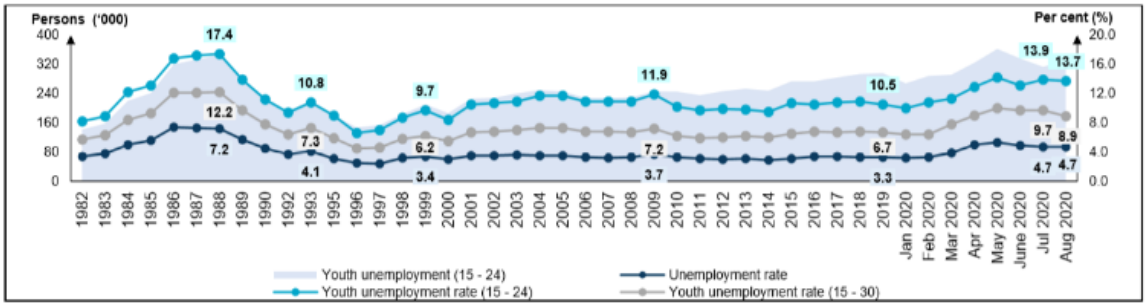

Figure 2: Unemployment rate by selected age groups, 1982 - 2019 and January - August 2020 (Source: Department of Statistics)

In this article, we will closely look at the four selected economics data, in particular the urbanization, inflation, gross domestic product and foreign direct investment and investigate which are the factors that directly influence youth unemployment in Malaysia. The elementary findings from this article will shed lights to improve the proper strategy to address this issue in the future.

A Unemployment

In the early economic framework, unemployment is generally seen as an unadapt situation, instead of a short-term supply and demand of servant's issue (Margo, 1992). Fajana (2000) highlighted that unemployment refers to a circumstance in which people are eager and ready to work but cannot find suitable paid employment. Chowdhury and Tanjil (2014) also interpreted unemployment as the state of not possessing a career or being out of work or ratio of people who can work and actively pursue occupations but fail to find them. In a more specific term, International Labor Organization defined youth unemployment rate as 15-24 years old who were not in employment, but keen and capable to

work for pay, stand-by to work, and diligently pursue employment. In general, unemployment is a term that applies to employable people who want a job but cannot find it.

B Urbanization

Mayhew (1997) expressed that urbanization is associated with the increase of residents in urban places or towns through migration from agriculture areas, mostly common due to the changes in social and economic positions, a transition from rural to urban societies. Urbanization is crucially linked to migration. Individuals normally choose to migrate when they are drawn by more opportunity in the city that offer greater economic prospects in the long run than the countryside. Urbanization has been spreading rapidly in most developing countries since the early twentieth century. Malaysia is presently among East Asia's most urbanized countries and one of the globally fastest industrialized regions over the last decade. Malaysia's urban population had grown from about 66% in 2004 to 76% in 2018. It is predicted that this growth will continue as individuals from rural areas immigrate to urban areas by cause of the continuing change from agriculture to industry and services (Plecher, 2020). When industrial development occurred in urban areas, it leads to the shifting of job seekers from rural to urban that overburden the urban job market. This situation is also called crowding out. In Pakistan, urban unemployment is much higher than rural areas because the population and number of job seekers are increasing in Pakistan's urban areas (Fatima & Sharif, 2019). These few years, Malaysia's urban process is relatively rapid. More people will be moving to and living in major cities. This research paper would like to check if there any linkage between urbanization and unemployment in Malaysia.

C Inflation

Friedman argued that inflation is a monetary policy and can be generated by an accelerated change in the amount of money than output. Whereas, economists defined inflation as a rising price in the general price level of goods and services in a sector over time. Every unit of currency purchases lesser goods and services as the price level increases. Therefore, inflation represents a decline in purchasing power per unit of money (Ezenekwe, 2020). Phillip curve representing the relationship between inflation and unemployment that have a stable and reciprocal relationship. This theory assumes that economic growth comes from inflation, creating more entry-level positions and less unemployment. High inflations induced consumers to buy more intensively; thus, it will increase production activity and reduce unemployment. Hence, high levels of employment can be achieved only at high levels of inflation (Investopedia, 2020). Studies from Stamatiou and Dritsaki (2018) showed a consistent Phillips curve for Poland in 1992–2017. Alisa (2015) also discussed the inflation-unemployment relationship by using the Phillips curve model. A conclusion was derived where an extent of inflation and unemployment are required to balance the market. The so-called ideal macroeconomic situation where the price is steady, null unemployment and stable economic growth are impossible to happen in the short-run.

D Gross Domestic Product (GDP)

Gross domestic product (GDP) is the combined value of all the services and goods manufactured within a country's geographical borders for a specific timeframe, usually on a yearly basis (Amadeo, 2020). GDP is crucial as an important indicator because it reflects economic development and growth in a country. There is typically a lower level of unemployment when the economy is stable, and wages tend to increase as businesses hire more labour to meet the increasing demand of the economy. In order to determine how well an economy flourishes, economists look at a positive GDP growth from year on year. On the other hand, if GDP growth is negative, it may be an indication that an economy is in or approaching a recession or an economic downturn (Kramer, 2020). In the early 19th century, Okun statistically established a significantly negative relationship between GDP growth and unemployment, widely recognized as Okun's Law (Knotek II, 2007). This law stated that a 1% reduction in GDP could be directly linked with a slightly around 2% rise in the unemployment rate.

There have been quite a number of researchers who try to assess the applicability of Okun's law in their country. Al-Hosban (2017) conducted a study to analyse, evaluate and check the relationship between the Jordanian economy's unemployment rate and GDP from 1982 to 2016. The results showed that the unemployment-GDP relationship is negative and this is following Okun's law. Though, Adenomon and Tela (2017) reported that Okun's law is not applicable in the Nigerian economy.

E Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is a direct investment made by a company in one country to obtain significant shareholding of another company in foreign country (Ho *et al*., 2014). FDI has played a crucial role for a developing country such as Malaysia, in particular in manufacturing sector as it can generate more jobs. Malaysia is considered as one of the largest exporters of semiconductor products, particularly in electronic products and appliances (Wong, 2005). One of the objectives of achieving the rapid economic growth in the country is to attract and increase foreign investment in different economic sectors as to improve job creations, thus the issue of labour can also be solved (Nordin, 2017). FDI is able to reduce unemployment rate in most countries. Haddad (2016) studies the relationship in Jordan an Arab country, as these countries faced crucial issue of unemployment and poverty, thus slowing down economic development. They found significant relationship between these two issues and FDI is negatively impact on unemployment. This implied that FDI can become one of the crucial factors that can solve country's unemployment crisis.

2 Methodology

A The Data

This study collected secondary data from an open sources' website which are available online. The data were extracted from the Department of Statistic Malaysia and the World Bank websites. The independent variables are urbanization, inflation, GDP, and FDI, while the dependent variable is the youth unemployment rate. Data collection period is covered from 1991 to 2019, with a total of 29 sample size. All these data are collected on an annual basis.

B Descriptive Analysis

Salkind (2017) defined descriptive analysis as data analysis techniques used to organize and explain the structural features of data that researchers recorded. In this research, youth unemployment is calculated by the number of unemployed people aged 15-24 year-olds expressed as a percentage of the youth labour force, the urbanization rate is measure by the percentile of the citizens living in urban zones, and the inflation rate is measured by the consumer price index over time. In comparison, GDP is counted by the percentage of growth in annual basis. FDI measure in terms of net inflow in Malaysia based on the percentage in GDP.

C Pearson Correlation Analysis

Pearson correlation is applied to ascertain interdependence between independent and dependent variables (Hon& Tsz, 2015). This technique determines the direction of the relation between two variables and the magnitude of the relations. Population coefficient of correlation is referred as ρ. The sample correlation coefficient is written as *r*. *r* value is in the midst of -1 and +1 where +1 shows a strong positive relationship between variables, -1 implies a strong negative correlation, and 0 reveals no relationship. Following is the formula of correlation coefficient.

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

r = correlation coefficient
x_i = values of the x-variable in a sample
$\bar{x}$ = mean of the values of the x-variable
y_i = values of the y-variable in a sample
$\bar{y}$ = mean of the values of the y-variable

D ANOVA

ANOVA was performed for checking whether a significant relationship exists between the dependent variable, youth unemployment to every one of the independent variables: urbanization rate, inflation, GDP, and FDI.

E Normality Test

Normality test is a mathematical method to test if the data is normally distributed (Razali & Yap, 2010). This procedure is applied to consider the distribution of all the independent variables and the dependent variable of the research. Researchers should standardize the data to become normal if it is not to obtain more accurate and way higher reliability results. Since the sample size is less than 50, Shapiro-Wilk test is appropriate to be used. If the *p*-value from the software output is higher relative than α, we fail to reject the null hypothesis consequently come out with the conclusion that the data is normal. Otherwise, the data is not normal.

F *Multicolinearity Test*

Multicollinearity denoted a linear relationship between the independent variables. For this paper, we focus on using VIF to diagnose multicollinearity since it is the most commonly used diagnostic method. It is called the variance inflation factor (VIF), because it evaluates how far a coefficient variance is "inflated" due to linear dependence on other variables. The formula to calculate is $VIF = \frac{1}{(1 - R^2)}$. Unless the value of VIF exceeds 10, otherwise it indicates that there is no presence of a multicollinearity detected within the regression (Sinan & Alkan, 2015). If the VIF was larger than 10, we could remedy this problem by eliminating the insignificant variable among the highest correlated pair.

G *Multiple Regression Analysis*

Multiple regression analysis is identified as "an analytical approach for predicting variability in the dependent variable by regressing the independent variable against it". This test allows us to conclude the significance of the factors corresponded to the unit of analysis. According to Hair, Anderson, Tatham, and Black (2010), multiple linear regression was suitable for testing more than two interval variables.

$$Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + \varepsilon ,$$

where

Y = Youth Unemployment
x_1 = Urbanization
x_2 = Inflation

x_3 = GDP
x_4 = FDI

3 Results

Table 1 shows the descriptive statistics of youth unemployment, urbanization, inflation, GDP and FDI in Malaysia from year 2010 until year 2019.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Unemployment	29	8.48	12.27	10.7885	.86425	-1.162	.434	1.661	.845
Urbanization	29	50.58	76.61	65.5326	7.94411	-.371	.434	-1.056	.845
Inflation	29	.58	5.44	2.6694	1.33972	.367	.434	-.616	.845
GDP	29	-7.36	10.00	5.6781	3.60677	-1.902	.434	5.503	.845
FDI	29	.06	8.76	4.0240	1.92712	.558	.434	1.030	.845
Valid *N* (listwise)	29								

The lowest rate of youth unemployment is at 8.48 while the highest is at 12.27. It has a skewness of -1.162 which means it is negatively skewed. The kurtosis of 1.661 indicates that it is a light-tailed distribution. Based on the table, the minimum level of urbanization is 50.58% and the maximum level is 76.61%. It shows a value of skewness -0.371 and this show that it is fairly symmetrical. The distribution has a light tail since the kurtosis is -1.056. The inflation rate has the lowest value at 0.58 and the highest value is 5.44. The data for inflation has nearly symmetrical since the skewness is 0.367, with a light tailed distribution since the kurtosis is -0.616. GDP growth rate is the lowest at -7.36% during the recession in year 1998 and the highest at 10.00%. It is a negatively skewed distribution and with a heavy tail distribution. FDI has the lowest net inflows of 0.06 and the highest net inflow at 8.76. It is fairly symmetrical distribution with skewness of 0.558. It is a light tail distribution since the kurtosis value is 1.030.

Table 2: Pearson Correlation Coefficient

		Youth Unemployment	Urbanization	Inflation	GDP	FDI
Youth Unemployment	Pearson Correlation	1	.048	-.186	-.178	-.130
	Sig. (2-tailed)		.803	.334	.357	.501
	N	29	29	29	29	29
Urbanization	Pearson Correlation	.048	1	-.487**	-.346	-.658**
	Sig. (2-tailed)	.803		.007	.066	.000
	N	29	29	29	29	29
Inflation	Pearson Correlation	-.186	-.487**	1	.087	.569**
	Sig. (2-tailed)	.334	.007		.654	.001
	N	29	29	29	29	29
GDP	Pearson Correlation	-.178	-.346	.087	1	.650**
	Sig. (2-tailed)	.357	.066	.654		.000
	N	29	29	29	29	29
FDI	Pearson Correlation	-.130	-.658**	.569**	.650**	1
	Sig. (2-tailed)	.501	.000	.001	.000	

	N	29	29	29	29	29
**. Correlation is significant at the 0.01 level (2-tailed).						

A Urbanization and Youth Unemployment

The correlation coefficient which is 0.048 shows the relationship between the two variables is positive. Therefore, urbanization and youth unemployment have a positive and very weak relationship between themselves.

B Inflation and Youth Unemployment

The value of -0.186 in Pearson Correlation indicates that inflation has negative and weak relationship with youth unemployment rate in Malaysia. An increase in inflation will lead to a decrease in unemployment.

C GDP and Youth Unemployment

The value of correlation coefficient for GDP and unemployment is -0.178. Hence, the relationship between GDP and unemployment has negative and weak correlation.

D FDI and Youth Unemployment

The value of correlation coefficient from FDI and unemployment is -0.130. Therefore, there is an inverse correlation relationship between FDI and unemployment.

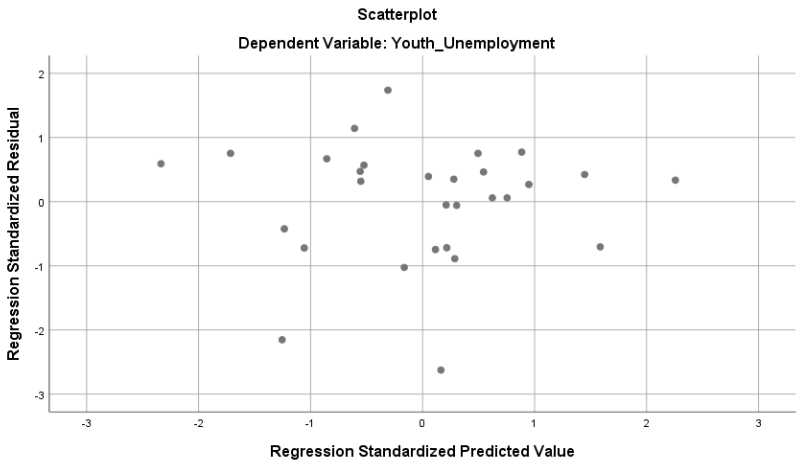

Figure 1: Scatterplot

Table 3: Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Youth Unemployment	.167	29	.038*	.902	29	.101
Urbanization	.096	29	.200*	.943	29	.123
Inflation	.118	29	.200	.964	29	.405
FDI	.248	29	.000*	.810	29	.200
GDP	.144	29	.128	.943	29	.118

For the normality test, we will look at the Shapiro-Wilk test. Since all the test statistic values are larger than α value which is 0.05, it indicates that the data is normally distributed.

Table 4: Multicollinearity

	Collinearity Statistics	
Model	Tolerance	VIF
Urbanization	.546	1.832
Inflation	.529	1.892

GDP	.457	2.188
FDI	.255	3.923

Based on the result in Table 4, each VIF of the variables are below 10. Therefore, the regression model does not have serious multicollinearity between each independent variable.

Table 5: Model Summary

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.286[a]	.482	.371	.89443
a. Predictors: (Constant), FDI, Inflation, Urbanization, GDP				
b. Dependent Variable: Youth Unemployment				

Table 5 shows the R-Square (R^2) value that represents the percentage of the response variable variation that is explained by a linear model. The R^2 of 0.482 indicates that 48.2% of the research result is significant to investigate the regression model. In other words, 48.2% of the variability of dependent variable (youth unemployment) is explained by the four independent variables (urbanization, inflation, GDP and FDI). It can be assumed that the remaining percentages are caused by other variables that are not in the study.

Table 6: Hypothesis testing

Independent Variables	**Hypothesis**	**Conclusion**
Urbanization	$H_0: \beta_1 = 0$ $H_1: \beta_1 \neq 0$	Do not reject H_0.Urbanization has an insignificant relationship with youth unemployment.
Inflation	$H_0: \beta_2 = 0$ $H_1: \beta_2 \neq 0$	Do not reject H_0. Inflation has an insignificant relationship with youth unemployment.
GDP	$H_0: \beta_3 = 0$ $H_1: \beta_3 \neq 0$	Reject H_0. GDP has a significant relationship with youth unemployment.
FDI	$H_0: \beta_4 = 0$ $H_1: \beta_4 \neq 0$	Reject H_0. FDI has a significant relationship with youth unemployment

Table 7: Parameter Estimates

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	*t*	Sig.
(Constant)	11.981	2.267		5.285	.000
Urbanization	.009	.029	.083	-.314	.757
Inflation	-.196	.174	-.304	-1.132	.269
GDP	-.072	.069	-.299	-1.032	.032
FDI	-.082	.174	-.183	.471	.024

Based on the result, an equation is formed as below.

$Y = 11.981 + 0.009X_1 - 0.196X_2 - 0.072X_3 - 0.082X_4 + \varepsilon$
where:
Y = Youth unemployment rate

X_1 = Urbanization rate
X_2 = Inflation
X_3 = GDP
X_4 = FDI
For b_0 = 11.981 indicates that if there is no urbanization, no inflation, no GDP growth, no FDI, the estimated youth unemployment increase by 12%. On the other hand, when GDP growth improves by 1%, youth unemployment will be lowered by 0.072%, holding all other variables constant. Likewise, a rise of 1% in the FDI will lead to an approximately decrease in youth unemployment by 0.082%. Based on the hypothesis testing, urbanization and inflation are found to be insignificant, so interpretation is inappropriate for these two coefficients.

Table 8: ANOVA Table

Model	Sum of Squares	df	Mean Square	*F*	Sig.
Regression	1.714	4	.428	4.536	.041[b]
Residual	19.200	24	.800		
Total	20.914	28			
a. Dependent Variable: Youth Unemployment					
b. Predictors: (Constant), FDI, Inflation, Urbanization, GDP					

Table 8 shows the ANOVA table. *F*-value represents the statistical significance of the overall regression model. It examines how well the overall regression model is a good fit for the data. From the table, the *p*-value associated with the F-statistic is 0.41, so it is concluded that the model is significant.

Table 9: Summary of The Results

Test	**Result**
Pearson Correlation Coefficient	Urbanization is positively-correlated with youth unemployment rate while the remaining variables are negatively correlated.
Normality Test	The data is normal
Multicollinearity Test	No multicollinearity
F-test	The overall model is significant
t-test	FDI and GDP have significant relationship with youth unemployment.

Results from the Pearson Correlation show a weak positive relation between the rate of urbanization and youth unemployment. Hypothesis testing, however, indicates that the relationship between these two variables is not significant. This outcome is different from the result of Fatima & Sharif's (2019) paper, which states the over-population in Pakistan's urban areas leads to urban unemployment. It shows that the urbanization has no impact on youth unemployment in Malaysia. Whereas, based on the regression result, inflation has an insignificant relationship with youth unemployment. The result shows that Malaysia's inflation-unemployment relationship is not in line with the Philip curve theory, so this approach is not valid in the case of using youth unemployment.

The findings show that GDP has an inverse relationship with youth unemployment and these two variables are significantly related. Such conclusions come out to be consistent with Okun's law when it reveals that negative and significant relationships exist between economic growth and youth unemployment. Based on the result shown above, FDI has a negatively significant relationship with unemployment. As per the regression model, a growth of 1 percent in FDI would decrease unemployment by 0.082 percent. It means that FDI has a significant contribution to reducing youth unemployment in Malaysia. This relationship has been consistent with Haddad's past research (2016), just the country is different.

4 Conclusion

To summarize the conclusion, this research is to investigate the relation between urbanization, inflation, GDP and FDI on youth unemployment in Malaysia. Factors such as GDP and FDI have significant relationship with the youth unemployment rate whereas urbanization and inflation do not significantly affect youth unemployment rate. Such results might due to the regression model that uses small sample size of data it creates difficulty for the regression model to predict the true relationship between the dependent variable and independent variable. Through this study, the government and policymakers can make a better decision by understanding which element significantly affects Malaysia's youth unemployment rate. Since youth unemployment is a rather impactful element that does specifically influence a country's economic development, the government has to take a long-run strategy to increase the labor force participation rate and maximize employee productivity. In resolving the issue regarding youth unemployment, the government and the private sector both play a part.

It is found that increasing the GDP growth can help to decrease unemployment in Malaysia. It is encouraged that the government to spend wisely and un-excessively in keeping the economy going. The government should spend more on the education sector to improve skills and education to increase labor productivity and enable higher long-term economic growth. Therefore, increased labor productivity would help create various job chances for local citizens, incredibly fresh graduates. It is recommended that on the job training provided to new employees to develop the youth skills. It is also shown that FDI also appears to play an important responsibility in reducing unemployment. Some initiatives to increase FDI, which improve the quality of infrastructure, lower corporate taxes for foreign firms, and increase subsidies to foreign firms, may be implied by the government. Excellent services are vital for developing countries to attract more foreign investors to set up their business in that country. Infrastructure to provide may include telecommunications, warehouses, sanitation, industrial facilities, and whatever else. Such infrastructures are expected to make foreign investors confident to invest in the country.

Overcoming youth unemployment issue in Malaysia is crucial to ensure the sustainability of the country in braving future technological advancement, and in the race to become a high-income nation in the immediate future.

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