

Globalization and Economic Growth in Developing Countries.

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Abstract: This article observed the impact of globalization on economic growth of 27 developing countries from the year 2009 until 2018. Gross Domestic Product (GDP) per capita is used as dependent variable to measure economic growth. This paper employed static panel data to analyse the impact of population growth, human capital, financial development, foreign direct investment and globalization on economic growth. The results reveal globalization has a significant impact on economic growth. Interaction term were used to measure the effectiveness of globalization in influencing foreign direct investment and its impact on economic growth. Magnificently, this interaction term provides a positive significant impact on economic growth. This means that more economic incorporation through globalization will encourage foreign direct investment and eventually accelerate economic growth. All independent variables used suggest significant impact on economic growth. This study will enhance literature on factors influence economic growth and provide an overview of indicators to stimulate economic growth.

Key words: *GDP per capita, population growth, human capital, globalization, foreign direct investment, financial development, interaction term*

INTRODUCTION

Most economists believe the impact of globalization is positive and supported it with empirical results [1][2][3][4]. Without denying the challenges of global integration, optimist economists ponder globalization will stipulate a large contribution in economic growth and poverty eradication in several countries. This is anticipated by increasing in resource efficiency or input utilization and liberalization-generated enhancement in productivity of local firms.

Country that is highly globalize tends to attract more foreign direct investment (FDI) and it will promote economic growth. Globalization index introduces by KOF (Konjunkturforschungsstelle) Swiss Economic Institute capturing political, economic and social globalization of country is a great measurement that can be used to study economic growth. According to Globalization Index in 2018, country that is highly globalized such as Switzerland, Netherland,

Belgium, United Kingdom and Germany are the countries that received higher FDI inflow [5].

On the contrary, some economists claim that the benefit of globalization are not distributed equally among the citizens, thus broadening the gap between the high- and low-income groups [6][7][8]. The reason for the broadening gap between the high- and low-income groups can be explained with the Stolper-Samuelson theorem [9]. Through trade liberalization as a result from globalization, more skilled labours are needed in the production process. Thus, the wages of skilled labour will increase while those of unskilled labour decrease.

Since the evolution of classical economic growth, economists have done significant amount of empirical studies to show the important of human capital and population growth in accelerating economic growth [10]. The reasoning behind this is that human capital assisted technological transfer and innovation. According to classical Solow model,

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countries with high population growth rates tend to be poorer on average [11]. High population growth rate in low income countries may dimmer their development while low population growth in high income countries is likely to generate social and economic problem that will dampen economic growth [12].

This article intends to provide significant insights and to answer questions, ‘What are the features that influence GDP per capita in developing countries?’ and ‘Does globalization influence economic growth?’. The results of this article aim to provide framework for policy makers of developing countries that would alike to accelerate their economic growth.

LITERATURE REVIEWS

Gross Domestic Product per capita (GDP per capita) has been used widely as one of the measurements of country’s economic growth. The reporting of GDP growth can be highly misleading as it only measuring the changes in output produced but not the changes in wealth received by citizens. For countries with lower population rate, the difference between GDP per capita and GDP growth is not as big as experience by countries with high population growth. Thus, past researchers strongly alleged that GDP per capita is better than GDP growth in a measurement of country’s prosperity [13][14][15][16].

In recognizing the drivers of economic growth researchers have used countless variables in empirical research. Macroeconomic variables has been commonly used as indicators to influence economic growth. Keynesian model suggests increasing in consumption, investment, government expenditure and net export can increase national output and directly increase economic performance of countries [17].

Among others, population growth [18][19], foreign direct investment [20][21], trade openness[22][23] globalization [24][25], inflation [26][27], labour productivity [28][29][30] and financial development [31][32][33]. Still, the researchers could not accomplish a standard conclusion in relation of these indicators with economic growth.

The studies of [34] found a positive impact of human capital on the economic growth in England from 1900 until 2018. However, the negative impact of human capital on growth is found by [35] in East Asia country which employed panel data set in post 1997 crisis and suggest government should focus more on health rather than education (education used as a proxy of human capital and it is shown as insignifciant to economic growth). In most cases, it

is found that physical capital always provide a positive impact to economic growth. Investment is commonly used as a proxy of physical capital.

Study conducted by [36] on Brazil and Mexico during 1990 to 2010 estimated using the Vector Error Correction Model (VECM) found a positive relationship between FDI and economic growth. [33] also got similar results in Indonesia, Nigeria, Brazil, Russia, India and China for the year of 2001 until 2011. [31] observed contatry results between these two variables in Japan, Germany, United Kingdom and United States while adopting a gravity model.

The studies on the relationship between population growth and economic growth provide mixed evidence. [18] employed exploratory methodology and found a positive impact of population growth in Islamic countries. The negative impact also was found by [19] that used cointegration approach in Pakistan.

The above argument indicates that there is no specific elements that can speed up economic growth. This is because of country heterogeneity, uniqueness, choices of variables, period span and different methodologies employed ensuing to the variation of answers.

METHODOLOGY

Data used in this article were obtained from the World Bank databases to analyse factors influence GDP per capita in 27 developing countries for the ten-year period 2009-2018. Developing countries involved are Bolivia, Botswana, Bulgaria, Burkina Faso, Cameroon, China, Colombia, Congo, Costa Rica, Cote D'Ivoire, Dominican Republic, Ecuador, Egypt, Arab Republic, El Salvador, Gabon, Gambia, Ghana, Guatemala, Honduras, Iran, Jordan, Kenya, Latvia, Lithuania, Madagascar, Malawi and Malaysia. Globalization index were cited from KOF Swiss Institute website. Stata software were used to analyse the data.

Table 1: Variables with its symbol and definition.

Symbol	Variable	Definition
LRGDPC	Gross domestic product per capita	Annual GDP per capita (USD constant price)
LPG	Population growth	Annual amount of population growth (%)

LLE	Human capital	Life expectancy after birth Proxy for human capital (as mentioned by World Bank)
LGI	Globalization index	Annual figure of Globalization Index
LFD	Financial development	Private sector credit (as % of GDP)
LFDI	Foreign direct investment inflow	Annual amount of FDI
GI*FDI	Interaction variable	Interaction between globalization index and FDI

Table 1 represent variables used and its definition. GDP per capita is used as dependent variable as it shown a good measurement of country's economic growth as mentioned by World Bank where it indicates a prosperity of the citizens. Population growth is expected to provide positive impact to GDP per capita as a country with high population growth means country has a greater market size that will influence consumption and economic growth. According to World Bank, life expectancy can provide a clear view of human capital development of country. The higher life expectancy means a good health condition of labour force thus it can be used as a proxy of human capital. The higher amount of human capital will increase GDP per capita as stated by Neo-Classical Economist [10]. Globalization index data was obtained from KOF Swiss Economic Institute website and it measure the economic, social and political fields [5]. Globalization index shows scores between 0 and 100, the higher number of indexes means the more interconnected a country is with others in the world [5]. Thus, expected impact from globalization index to GDP per capita is positive. Private sector credit as a percent of GDP is used to represent country's financial development. Accumulation of this financial asset indicates a positive financial development and it sure has a positive relationship with GDP per capita [36]. This article provides an interaction variable between globalization index and FDI. It indicates if a country is highly globalized, it will attract more foreign investor and eventually will promote economic growth.

The model specification for this article is as follows:

$$LRGDPC_{i,t} = \beta_0 + \beta_1 LPG_{i,t} + \beta_2 LLE_{i,t} + \beta_3 LGI_{i,t} + \beta_4 LFD_{i,t} + \beta_5 LFDI_{i,t} + \beta_6 LGI*LFDI_{i,t} + \varepsilon_{i,t}$$

i represents the *i*th country and *t* represents the year. This article employed traditional panel data technique which is static panel data. Static panel data analysis studies time series and cross-sectional data at once. There are three types approaches for static panel data models variation which are pooled OLS, random and fixed effect model.

Pooled model uses all variation in the data. It assumes that both the intercept and the slope are the same across units and time and it might provide results with heterogeneity bias. In the random effect model, the error term ε_{it} is serially correlated within a unit and λ_i are drawn independently from probability distribution. This is because all observations within a unit have a common component λ_i and its error term become $\varepsilon_{it} = \lambda_i + \mu_{it}$. Meanwhile for fixed effect model, λ_i is treat as a constant/ fixed for each individual. It means, individual specific effects are assumed to be individual specific intercepts, or more crucially when $Cor(\lambda_i, x_{it}) \neq 0$. In the fixed effect model, some unobservable variables are correlated with the independent variables. Thus, each equation will be as follow:

Pooled OLS:

$$LRGDPC_{i,t} = \beta_0 + \beta_1 LPG_{i,t} + \beta_2 LLE_{i,t} + \beta_3 LGI_{i,t} + \beta_4 LFD_{i,t} + \beta_5 LFDI_{i,t} + \beta_6 LGI*LFDI_{i,t} + \varepsilon_{i,t}$$

Random effect model:

$$LRGDPC_{i,t} = \beta_0 + \beta_1 LPG_{i,t} + \beta_2 LLE_{i,t} + \beta_3 LGI_{i,t} + \beta_4 LFD_{i,t} + \beta_5 LFDI_{i,t} + \beta_6 LGI*LFDI_{i,t} + \lambda_{i,t} + \mu_{i,t}$$

Fixed effect model:

$$LRGDPC_{i,t} = \beta_0 + \beta_1 LPG_{i,t} + \beta_2 LLE_{i,t} + \beta_3 LGI_{i,t} + \beta_4 LFD_{i,t} + \beta_5 LFDI_{i,t} + \beta_6 LGI*LFDI_{i,t} + \varepsilon_{i,t}$$

Breusch-Pagan test was conducted to choose between pooled model and random effect model. The hypotheses for the test are as follow:

$$H_0: \sigma_1^2 = 0 \text{ (Pooled OLS – Homogeneity)}$$

$$H_0: \sigma_1^2 > 0 \text{ (Random effects – Heterogeneity)}$$

If p-value from Breusch-Pagan test is less than 0.05, reject H_0 at 5 percent significance level, thus, random effect is preferable or there is a heterogeneity in the data sets.

Then, Hausman test were carried out to determine the appropriate specification either random effect or fixed effect in estimating the model.

H_0 : Cov (λ_i, x_{it}) = 0 (no correlation between λ_i & x_{it}); support random effect

H_1 : Cov (λ_i, x_{it}) \neq 0 (correlation between λ_i & x_{it}); support fixed effect

If the Chi-square test of Hausman is greater than the critical value or p-value from test is less than 0.05, reject H_0 at 5 percent significance level, thus, fixed effect is preferable than random effect and implies there is a correlation between λ_i and x_{it} .

After obtaining, the best fitted model, diagnostic tests need to be performed to ensure the model is free from multicollinearity, heteroscedasticity, serial correlation and outlier problems. Tests that need to be conduct is as follows:

Table 2: Diagnostic tests

Econometric problem	Diagnostic test
Multicollinearity	Variance inflation factor (vif.)
Heteroscedasticity	Wald test
Serial Correlation	Woolridge serial correlation test
Outlier	Cook's distance test

RESULTS AND DISCUSSION

Table 3 shows estimation results of three different models. Three different models were regressed to choose the best fitted model that can be used to estimate factors influence GDP per capita in 27 developing countries. From Breusch-Pagan test, the p-value is less than 0.05, thus random effect model is more appropriate than pooled OLS model. Next, Hausman test that is commonly used in applied panel data is conducted to determine which model is appropriate: random effect or fixed effect. The p-value of the Chi-square value from the Hausman test for random effect were less than 0.05. Thus, fixed effect model specification was employed to estimate the panel model. Table 3 represent a summary of the results.

The best appropriate estimation model is identified as fixed effect model which is Model 3. From Table 3, all independent variables provide significant impact on GDP per capita in developing countries at

1 percent significance level. Nonetheless, only population growth (LPG) provides insignificant impact to GDP per capita. According to [11], population growth will provide more market size and increasing in accumulation of knowledge. However, [12] and [18] found that in modern era, knowledge and technology transfer can dampened the contribution of population growth to economic growth.

Human capital (LLE) discover to be positively significant influencing GDP per capita in developing countries at 1 percent significance level. Increasing in human capital is believed to contribute in increasing of average productivity of worker [30]. Increase in longevity found to be the important factor of demography on per capita income growth in developing countries.

Globalization index (LGI) provide negative influence on GDP per capita in developing countries. It indicates if the globalization index score rises by one point, this will lead to a decrease of around 0.342 percentage of real GDP per capita growth rate. This result is similar with result by [37]. There are several risks from globalization that believe can decrease GDP per capita which is its impact on socio economic development precisely on income distribution, demographic changes and educational levels. This include in job losses due to open economy and lower skilled are worse off due to technology transfer.

Financial development (LFD) measured as percent of private sector credit to GDP shows a positively significant impact to GDP per capita in developing countries. This is similar with [23] [29] where this indicator shows a relevant process of capital accumulation in accelerating economic growth. Results reveals that, a 1 percent increase in private sector credit leads to an increase in economic growth by 0.80 percent.

Foreign direct investment (LFDI) indicates a negatively significant impact to economic growth in developing countries. This is due to different components of FDI flows do have different impact on sectoral growth. FDI inflows likely leads to draining resources and hurting growth in certain industry such as manufacturing [38].

Model 3 has implied the interaction terms between globalization index and FDI (GI*FDI) and results shows this interaction term do provide significant positive impact on growth at 1 percent significance level. It senses that the more globalize the economy, the higher FDI will flowing in and eventually resulting to a higher economic growth.

CONCLUSIONS

Based on observation, fixed effect model is the most appropriate estimation model to determine factors influencing GDP per capita in 27 developing countries. In fixed effect model without outliers the most influential role in determining GDP per capita is human capital. Thus, in achieving a sustain increase in GDP per capita government of each countries need to guarantee that their countries

improved health care and education level as indicators to improve human capital. All independent variables used (except population growth); globalization index, financial development, foreign direct investment and interaction terms are significant in influencing GDP per capita in developing countries. Policy makers must focus upon improving physical capital alongside human capital to enjoy substantial economic growth.

Table 4: Results of panel data analysis
Dependent variable: Real GDP per capita

	Model 1: Pooled OLS	Model 2: Random Effect	Model 3: Fixed Effect
Constant	-52.58*** (15.69)	7.322*** (2.527)	7.558*** (2.492)
Population growth (LPG)	-0.270*** (0.0636)	-0.0244 (0.0233)	-0.0175 (0.0232)
Human capital (LLE)	2.556*** (0.722)	2.061*** (0.202)	2.029*** (0.200)
Globalization index (LGI)	11.74*** (4.058)	-2.202*** (0.638)	-2.215*** (0.630)
Financial development (LFD)	0.142 (0.111)	0.163*** (0.0300)	0.156*** (0.0298)
Foreign direct investment (LFDI)	2.025*** (0.777)	-0.397*** (0.121)	-0.396*** (0.120)
GI*FDI (GIFDI)	-0.479** (0.189)	0.0998*** (0.0299)	0.0995*** (0.0296)
Number of observations	233	233	233

1. Figures in the parentheses are t-statistics.

2. ***, ** and * indicate the respective 1%, 5% and 10% significance levels, respectively.

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