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ANALYSIS OF PHYSICAL, PSYCHOLOGICAL, AND SOCIAL CAPITAL ON THE WELFARE LEVELS IN NINE ASEAN COUNTRIES IN 2008-2018

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Abstract

This study aims to provide an overview the effect of the physical, psychological, social capital quality measured through education, honest behavior, and security againts the welfare in nine ASEAN countries on the period of 2008 - 2018. This study used secondary data in the form of per capita gross domestic product at constant prices, means years of schooling, corruption perception index and global peace index in nine ASEAN countries on 2008-2018. Data analysis used in this study is panel data regression analysis with the approach of Fixed Effect Model. The results showed that the variables of education, and honest behavior had a positive effect on the variable level of welfare in nine ASEAN countries in the period 2008 - 2018. Whereas for the security variable shows the results had no significant effect on the variable level of welfare in nine ASEAN countries in the period of 2008 – 2018.

Keywords: welfare, education; honest behavior, economic development, security, panel data.

1. Introduction

In the era of the industrial economy, the key to international competition is the high quality human resources. Indonesia as a developing country with the fourth largest population in the world, needs a comprehensive increase in national power. Then a question arises, what is the relationship between education and well-being? In theory, education can improve the quality of the workforce, encourage the spread of new knowledge, and improve the ability of the workforce. Theories of economic development in which a multidimensional process involves major changes in social structure, community attitudes, national institutions and accelerating economic growth, reducing inequality, and eliminating absolute poverty (Todaro and Smith, 2006).

Economic development is a multidimensional process involving major changes in social structure, attitudes of society, national institutions and accelerating economic growth, reducing inequality, and eliminating absolute poverty (Todaro and Smith, 2006). Economic development essentially has several objectives, one of which is to improve better welfare for the community which includes increasing and equitable distribution of consumption of basic needs, increasing

Vol. 4, No. 06; 2020

ISSN: 2456-7760

income levels and life improvement, increasing education equity, expanding economies of scale and availability of social choices for each individual (Todaro and Smith, 2006).

In order to implement economic development, capital is needed to achieve successful economic development. Referring to the World Bank (in Abbas, 2010) capital is divided into physical capital, human capital, and natural capital. Sustainable economic development can occur if improvement of physical capital and human capital increased without exploit natural capital. Today, human capital is no longer considered as a residual factor that has no direct relationship to economic development and welfare level. Human capital is now seen as a major growth engine that has a role in driving and encouraging economic growth and development.

Since the end of 2015, the member countries of the Association of Southeast Asian Nation (ASEAN) have become more integrated with the establishment of AEC (ASEAN Economic Community). AEC is an integrated economic region in Southeast Asia and a realization of the ASEAN Vision 2025, and also the ultimate goal of economic integration in the Southeast Asia region that can create a single market to increase the flow of trade in goods and services, investment, and skilled labor. In the end, it is intend to improve the welfare of ASEAN member countries, achieve stability and strengthen the economy in facing the global competition (Suroso, 2015).

The increasingly integrated ASEAN income currently requires ownership of specific knowledge, skills and expertise by the workforce. Without an increase in expertise and skills, efforts to increase productivity will be difficult to achieve, and this will hamper economic development. Therefore, it is necessary to develop physical, psychological and social capital as a prerequisite for strong economic development for ASEAN member countries. Increasing physical, psychological, and social capital in the context of increasing a country's economic growth can be developed from several variables, one of the most important is through the education variable. Good education will increase the ability of the state to improve modern technology, innovate, master the science and technology, and can increase capacity and productivity in order to create an increased economic development, and ultimately create an increase in society (Muljarijadi, 2011). The role of education is very important in increasing human capital and increasing economic growth in a country, as Ozturk (2001) has stated that no country can achieve development supported by increasing investment in development in education, so education will improve the quality of life, it will also bring broad and social benefits to individuals and society.

In addition to education quality to improve welfare, most country has several problems. One very critical problem is corruption. So far, corruption in Indonesia has become a serious problem. This is shown through the ranking of corruption in Indonesia which is still relatively high compared to other countries. During this time corruption continues to occur in the structure of human social life over a period of time. Corruption is considered to have a negative impact on human life both on the economy of society, as well as on the norms and culture of society. Corruption has become a problem in a country, both developed and developing countries.

Corruption has become an obstacle to development, and a barrier to improving the welfare of society, and is a serious problem in various countries in the world, including in the ASEAN

Vol. 4, No. 06; 2020

ISSN: 2456-7760

region. Corruption will continue to occur in the structure of human social life throughout a period of time. Corruption is considered to have a negative impact on human life both on the economy of society, as well as on the norms and culture of society. Corruption has become a problem in a country, both developed and developing countries. Due to its vast impact on human life, corruption is a common enemy that must be eradicated (KPK, 2016).

The relationship of corruption with the economy can be viewed through two major theories that are often debated, namely corruption as the oil of the development wheel (grease the wheels hypothesis) and corruption as an obstacle to the development of the wheel (sand the wheels hypothesis). The opinion of GWH (Grease The Wheels Hypothesis) is analogous in an effort to get a company establishment permit. Leff (1964) and Lui (1985) revealed that in a bad condition of the institutional system, the management and granting of a company establishment permit would take a long time and be convoluted. To reduce waiting time for obtaining company permits, individuals give bribes to public employees in order to obtain convenience in obtaining these permits. Meanwhile, Sand The Wheel Hypothesis (SWH) believes that corruption has a negative impact on the economy. This was supported by SWH's support, including RoseAckerman (1978), Shleifer and Vishny (1993), Jain (2001), Mo (2001), Mauro (1995; 1998), Meon and Sekkat (2005), Henderson and Kuncoro (2005) 2006), Rivayani (2008).

The general view, tends to be more agreed that corruption as a barrier to the development wheel (SWH) due to corruption disrupts economic activity by inhibiting the efficient allocation of resources in the economy. This opinion is in line with the statement of the World Bank (in Nawatmi, 2013) which estimates that more than US $ 10 billion or around 5% of world GDP every year is lost due to corruption. However, corruption also has a positive effect on the economy through a number of ways such as making the bureaucratic process shorter and can shorten the waiting time list so as to enable a faster permit process (Guriev, 2003; Nawatmi, 2013).

Apart from the positive and negative impacts of corruption on the economy, it must be realized that corruption is not a good thing to do because corruption means taking people's rights just to benefit themselves. Therefore, an antidote to corruption is needed to prevent people from acts of corruption and prevent corruption to grow and develop in a country. American Institute of Certified Public Accountants (AICPA) in Arens et al. (2012: 366) has compiled guidelines to prevent and detect corruption, one of which is by instilling a culture of honesty. A culture of honesty means that honesty is accepted and practiced as a habit. Habits are behaviors that are done repeatedly, and therefore in achieving a culture of honesty must start from honest behavior. Honest behavior is the product of good quality education, which in turn will create moral human capital and have positive values.

Economic development and economic growth in addition to being influenced by education, and people's behavior, are also influenced by several factors, one of which is the investment climate, consumer confidence, and other aspects of collective community awareness that are factors that can influence economic growth. If a country experiences a conflict, the investor will not invest, the bank will not provide loans, and producers cannot maximize their production, and the level of welfare of the people will fall. Therefore, a good level of security of a country will maintain

Vol. 4, No. 06; 2020

ISSN: 2456-7760

the stability of the economy and improve the welfare of the community by avoiding the community from the dangers of conflict and protecting the community from the threat of danger (Karimi, 2015).

The level of security in a country also plays an important role in the formation of social capital. A well-maintained level of security will create peace and avoid conflict. A country that avoids conflict will create quality human resources. If a country has a bad level of security and has a conflict, then the people will be filled with fear and difficulties to be able to develop their human capital to be better (Justino, 2011).

The level of welfare can divert people's attention from complaints that cause conflict, on the contrary conflict can make a country unable to guarantee welfare because it is preoccupied with saving itself or resolving conflicts (Portland Trust, 2007). Based on several studies that show that conflict can cause economic growth to decline. A good and stable level of security will prevent a conflict from occurring and maintain peace in the country.

Education, honesty behavior, and security levels are met, then it can create quality physical, psychological, and social capital. Therefore, improving the quality of capital must be a vital agenda for all countries. According to the World Bank (in Abbas, 2010) the progress of human capital can increase productivity affecting a country's economic growth. More than that, quality and prosperous physical, psychological, and social capital are the causes and goals of a country's development. Although in general physical, psychological, and social capital are important determinants of economic development and economic growth, they can also be a gap between developing and developed countries.

In general, almost all developing countries have low physical, psychological and social capital. This can happen because most developing country people lack the skills and productivity needed by more modern and more advanced industries and professions. On the other hand, people in developing countries have only a few people with higher education backgrounds, and lower living standards compared to developed countries. Especially when compared to the quality standards of education in developed countries, developing countries will lag very far even though the country is still in the ASEAN region.

Of course, these problems will make it difficult for developing countries to advance, and remain trapped in their status as developing countries for a long time. Seeing from these problems, developing countries must pay more attention to physical, psychological, and social capital as the main focus of the country's development to achieve better economic growth.

2. Method

This research was conducted in the ASEAN region which included nine of the ten Southeast Asian countries, that are Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. Whereas Brunei Darussalam encounter limitations and incompleteness of data, so Brunei Darussalam could not be included in this study. The timeframe that would be used as a reference are from 2008 to 2018.

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Variables in this study consist of dependent variables (bound) and independent variables (free). The dependent variable in this study is welfare and the independent variables in this study consist of education, honest behavior, and security. The data used in this study is secondary data, which includes GDP per capita, means year of schooling, corruption perception index, and global peace index.

Data analysis techniques that used in this study is panel data analysis methods. This method combines data across time (time series) and across regions (cross section). The cross section data in this study are nine (9) countries in the ASEAN region. While the time series data used are 2008-2018 period. So there are 9 cross-sectional units and 11 time periods which overall have 99 observations.

The econometric models used in this study are as follows:

$W = \beta 0 + \beta 1 PENDit + \beta 2 JJRit + \beta 3 KEAit + \mathcal{E}$

Explanation:

W: Welfare Level

PEND: Means Years of Schooling

JJR: Corruption Perception Index

KEA: Global Peace Index

β: Variable Coefficient

it: Combination of time series data and cross section

$\mathcal{E}$: Error term

3. Results

In this study the data obtained were processed using STATA 14 software in a panel using three approaches, namely: Pooled Least Squared (Common Effect), Fixed Effect (Covariance Model), and Random Effect (Error Component Model) approaches. The choice of panel data analysis method used in this study can be determined through the chow test and the hausman test. Both of these testing tools are the best way to determine which model is best for use in panel data regression analysis.

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Table 1. Chow Test Results

```
Fixed-effects (within) regression               Number of obs      =        99
Group variable: id                              Number of groups   =         9

R-sq:                                           Obs per group:
     within  = 0.8305                                         min =        11
     between = 0.8142                                         avg =      11.0
     overall = 0.8144                                         max =        11

                                                F(3,87)            =    142.10
corr(u_i, Xb)  = 0.1278                         Prob > F           =    0.0000
```

LnPDBcapita	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Pend	.3709692	.0254585	14.57	0.000	.3203676	.4215708
Kor	.1051283	.0199596	5.27	0.000	.0654563	.1448002
GPI	.0237215	.0919349	0.26	0.797	-.159009	.2064521
_cons	4.904796	.2524916	19.43	0.000	4.402942	5.406651
sigma_u	.55745972					
sigma_e	.06358645					
rho	.98715636	(fraction of variance due to u_i)				

F test that all u_i=0: F(8, 87) = 319.12 Prob > F = 0.0000

Source: Chow Test STATA 14, 2020

Based on the results of the Chow Test shown in table 1 above using an F table with $\alpha = 5\%$ and a Prob > F value of 0.0000 indicates that the probability value is smaller than the alpha value (0.0000 < 0.05). This states that the Chow Test results reject the hypothesis to use Pooled Least Squared and accept the hypothesis to accept the Fixed Effect Model. Then the Hausman Test is performed to determine the Fixed Effect Model or Random Effect Model method used in panel data regression analysis.

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Table 2. Hausman Test Result

```
. hausman fe re, sigmamore
```

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Pend	.3709692	.3654512	.005518	.0081866
Kor	.1051283	.1145735	-.0094452	.00311
GPI	.0237215	.0083553	.0153662	.0200934

```
                b = consistent under Ho and Ha; obtained from xtreg
     B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:  Ho:  difference in coefficients not systematic

           chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                   =         9.50
         Prob>chi2 =       0.0234
```

Source: Hausman Test STATA 14, 2020

Based on the Hausman Test results shown in table 4.2 above shows the value of Prob > Chi-Sq2 statistics of 0.0234. At the significance level $\alpha = 5\%$ and a probability value of 0.0234, it indicates that the probability value is smaller than alpha ($0.0234 < 0.05$). This states that the Hausman Test rejects the hypothesis for using the Random Effect Model and accepts the hypothesis for using the Fixed Effect Model. Thus, the best panel data regression technique that will be used in this study is the Fixed Effect Model.

After passing several empirical model selection tests, this research will use the Fixed Effect Model. In Table 3 below explains the Fixed Effect Model statistical test results processed through STATA 14 software.

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Table 3. Fixed Effect Model Statistics Test Results

```
. xtreg ln_x Pend Kor GPI, fe

Fixed-effects (within) regression               Number of obs      =        99
Group variable: id                              Number of groups   =         9

R-sq:                                           Obs per group:
     within  = 0.8305                                         min =        11
     between = 0.8142                                         avg =      11.0
     overall = 0.8144                                         max =        11

                                                F(3,87)            =    142.10
corr(u_i, Xb)  = 0.1278                         Prob > F           =    0.0000
```

ln_x	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Pend	.3709692	.0254585	14.57	0.000	.3203676	.4215708
Kor	.1051283	.0199597	5.27	0.000	.0654563	.1448003
GPI	.0237214	.0919349	0.26	0.797	-.1590092	.2064519
_cons	4.904797	.2524916	19.43	0.000	4.402942	5.406651
sigma_u	.55745971					
sigma_e	.06358646					
rho	.98715635	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(8, 87) = 319.12                     Prob > F = 0.0000
```

Source: FEM STATA 14 regression results, 2020

From the results of the Fixed Effect Model statistical tests the following equation is obtained: W = 4,904797 + 0,3709692 Pend + 0,1051283 Kor + 0,0237214 GPI + e

4. Discussion

Effects of Education on Welfare Levels

In this study it is known that the educational variable has a positive and significant influence on the level of welfare variable. The coefficient value of the education variable (LnPEND) is 0,3709692 which means that if education rises by 1 percent then the level of welfare will increase by 0,3709692%. The results obtained from the test are in accordance with the initial hypothesis that education has a positive effect on the level of welfare in nine ASEAN countries in the period 2008-2018.

It is also in accordance with the role of education that can improve the ability of a country to absorb modern technology, innovate, and be able to increase the capacity and productivity of a country's society, so that the income per capita obtained and the standard of living of the community increases, which in turn increases the level of community welfare. The results of this test are in line with research conducted by Lutz et al which states that education has a positive and significant effect on the level of welfare of a country.

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Effect of Honest Behavior on Welfare Level

In this study it is known that the variable of honest behavior has a positive and significant influence on the level of welfare variable. The coefficient value of the honest behavior variable (JJR) is 0,1051283 which means that if honest behavior increases by 1 percent, the level of welfare will increase by 0,1051283%. Thus the test results are in accordance with the initial hypothesis that honest behavior has a positive effect on the level of welfare in nine ASEAN countries in the period 2008-2018.

The results of this study are in accordance with the role of honest behavior which is one of the psychic capital behaviors of someone who can prevent someone from committing acts of corruption, so that the welfare of the community is not only enjoyed by a few groups. The results of this test are also in line with research conducted by Widiastuti (2013), which states that corruption can reduce the well-being of people in several countries, and it requires inculcation of honest behavior in order to overcome it.

Effect of Security on Welfare Levels

In this study it is known that the safety variable has no significant effect on the variable of economic growth. Thus the test results are not in accordance with the initial hypothesis which states that security negatively affects the level of welfare in nine ASEAN countries in the period 2008-2018. Security should have a role to maintain the stability of the economy and increase the level of welfare of the community by preventing the community from conflict and protecting the community from the threat of danger. But security can also produce negative peace, Galtung (2008: 16) defines negative peace as the absence of various other forms of violence. This definition is indeed simple and easy to understand, but seeing the reality that exists, many people continue to experience suffering due to invisible violence and injustice.

Acknowledgments

The nine ASEAN countries in this study should improve the quality of education. Not only the quality of education, but also motivate and encourage people in the nine countries to get education up to the level of higher education. By pursuing higher education, it is hoped that the community will be able to master science and technology, innovate and increase productivity. In addition, the other nine ASEAN countries that need to be considered are aspects of corruption eradication, in order to enhance economic development and public welfare. In order to eradicate the problem of corruption, policies that can be applied are the inculcation of values and a culture of honesty from an early age. Not only that, giving strict sanctions to individuals and officers when involved in corruption cases needs to be improved. It is also hoped that there will be integrity pacts among the nine countries in the eradication of corruption in ASEAN countries.

The level of security in a country is also important given that a country needs to maintain security in each country and between countries. Nine ASEAN countries need policies that are able to maintain the peace and security of a country. The safety factor arises from the community itself without any coercion or pressure from any party. If the community already has a positive sense of peace (positive peace), then it is easier for a country to maintain that security. The policies suggested to maintain the security of a country are to increase the

Vol. 4, No. 06; 2020

ISSN: 2456-7760

country's security and defense resources, strengthen the system of state security and defense institutions, educate the public about the importance of peace in the country early on, as well as increase public participation in maintaining security and defense between states.

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Vol. 4, No. 06; 2020

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APPENDIXES

Appendix 1

Data

Negara	Tahun	GDP Growth Constant 2010 (%)	Pendidikan (tahun)	Korupsi (indeks)	Keamanan (indeks)
Cambodia	2008	763,508498	3,900	1,800	2,179
Cambodia	2009	752,7964806	3,700	2,000	2,179
Cambodia	2010	785,5022829	4,400	2,100	2,252
Cambodia	2011	827,7770138	4,400	2,100	2,301
Cambodia	2012	873,9492833	4,500	2,200	2,207
Cambodia	2013	922,8902057	4,600	2,000	2,263
Cambodia	2014	972,7427283	4,700	2,100	2,201
Cambodia	2015	1024,621365	4,700	2,100	2,179
Cambodia	2016	1079,630539	4,700	2,100	2,161
Cambodia	2017	1137,821397	4,800	2,100	2,065
Cambodia	2018	1205,040941	4,800	2,000	2,101
Indonesia	2008	2885,309275	7,100	2,600	1,983
Indonesia	2009	2979,004714	7,300	2,800	1,851
Indonesia	2010	3122,362815	7,400	2,800	1,946
Indonesia	2011	3270,61949	7,500	3,000	1,979
Indonesia	2012	3421,27352	7,600	3,200	1,913
Indonesia	2013	3563,299864	7,800	3,200	1,879
Indonesia	2014	3692,973446	7,900	3,400	1,853
Indonesia	2015	3824,274885	7,900	3,600	1,768
Indonesia	2016	3968,055911	8,000	3,700	1,799
Indonesia	2017	4120,428561	8,000	3,700	1,850
Indonesia	2018	4284,652535	8,000	3,800	1,853
Laos	2008	1010,390665	4,400	2,000	1,810
Laos	2009	1068,168511	4,500	2,000	1,701
Laos	2010	1140,599205	4,600	2,100	1,661
Laos	2011	1213,184693	4,800	2,200	1,687
Laos	2012	1290,837748	5,000	2,100	1,662

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Laos	2013	1373,814438	5,100	2,600	1,724
Laos	2014	1456,467655	5,200	2,500	1,723
Laos	2015	1538,851169	5,200	2,500	1,700
Laos	2016	1621,738558	5,200	3,000	1,852
Laos	2017	1706,793233	5,200	2,900	1,800
Laos	2018	1785,576798	5,200	2,900	1,821
Malaysia	2008	8850,009221	9,000	5,100	1,721
Malaysia	2009	8559,2345	9,500	4,500	1,561
Malaysia	2010	9040,566251	10,000	4,400	1,539
Malaysia	2011	9372,007539	10,000	4,300	1,467
Malaysia	2012	9743,104797	10,100	4,900	1,485
Malaysia	2013	10061,71544	10,100	5,000	1,574
Malaysia	2014	10524,07074	10,100	5,200	1,659
Malaysia	2015	10912,15135	10,100	5,000	1,561
Malaysia	2016	11243,99591	10,200	4,900	1,648
Malaysia	2017	11728,98029	10,200	4,700	1,637
Malaysia	2018	12120,08326	10,200	4,700	1,619
Myanmar	2008	818,6511894	3,900	1,300	2,590
Myanmar	2009	899,2426442	4,000	1,400	2,501
Myanmar	2010	979,05163	4,100	1,400	2,580
Myanmar	2011	1025,892298	4,300	1,500	2,538
Myanmar	2012	1092,056509	4,500	1,500	2,525
Myanmar	2013	1174,054087	4,700	2,100	2,528
Myanmar	2014	1257,483616	4,800	2,100	2,473
Myanmar	2015	1335,203872	4,900	2,200	2,323
Myanmar	2016	1403,767118	4,900	2,800	2,256
Myanmar	2017	1489,171749	5,000	3,000	2,179
Myanmar	2018	1571,907217	5,000	2,900	2,302
Philippines	2008	2016,814655	9,000	2,300	2,385
Philippines	2009	2006,593843	9,000	2,400	2,327
Philippines	2010	2124,05677	8,900	2,400	2,574
Philippines	2011	2164,85508	9,000	2,600	2,574
Philippines	2012	2270,525865	9,100	3,400	2,415
Philippines	2013	2390,129291	9,100	3,600	2,374
Philippines	2014	2495,575295	9,200	3,800	2,456
Philippines	2015	2605,493599	9,300	3,500	2,462
Philippines	2016	2743,198363	9,300	3,500	2,511
Philippines	2017	2884,380594	9,400	3,400	2,555
Philippines	2018	3021,986863	9,400	3,600	2,512

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Singapore	2008	43216,24919	10,500	9,200	1,673
Singapore	2009	41983,06701	10,500	9,200	1,533
Singapore	2010	47236,96023	11,200	9,300	1,624
Singapore	2011	49159,38104	11,200	9,200	1,585
Singapore	2012	50102,2312	11,300	8,700	1,521
Singapore	2013	51671,14987	11,400	8,600	1,438
Singapore	2014	52994,03837	11,400	8,400	1,545
Singapore	2015	53883,81824	11,400	8,500	1,490
Singapore	2016	54764,86476	11,500	8,400	1,535
Singapore	2017	56740,75312	11,500	8,400	1,534
Singapore	2018	58247,87264	11,500	8,500	1,382
Thailand	2008	4801,876759	7,300	3,500	2,324
Thailand	2009	4744,756593	7,500	3,400	2,399
Thailand	2010	5076,342992	7,300	3,500	2,436
Thailand	2011	5094,466768	7,500	3,400	2,294
Thailand	2012	5437,870915	7,700	3,700	2,395
Thailand	2013	5558,723953	7,500	3,500	2,378
Thailand	2014	5589,31172	7,600	3,800	2,395
Thailand	2015	5741,339664	7,600	3,800	2,303
Thailand	2016	5911,951214	7,600	3,500	2,312
Thailand	2017	6128,658158	7,700	3,700	2,286
Thailand	2018	6361,62499	7,700	3,600	2,259
Vietnam	2008	1198,417214	7,000	2,700	1,730
Vietnam	2009	1250,795761	8,000	2,700	1,764
Vietnam	2010	1317,890706	7,500	2,700	1,787
Vietnam	2011	1385,890385	7,600	2,900	1,741
Vietnam	2012	1443,492615	7,800	3,100	1,736
Vietnam	2013	1505,810949	7,900	3,100	1,772
Vietnam	2014	1579,189102	7,800	3,100	1,792
Vietnam	2015	1667,171891	8,000	3,100	1,848
Vietnam	2016	1752,531946	8,100	3,300	1,906
Vietnam	2017	1852,963037	8,200	3,500	1,919
Vietnam	2018	1964,475991	8,200	3,300	1,905

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Appendix 2

Pooled Least Squared Methods

```
. reg ln_x Pend Kor GPI
```

Source	SS	df	MS		
				Number of obs	= 99
				F(3, 95)	= 403.90
Model	136.14525	3	45.38175	Prob > F	= 0.0000
Residual	10.6741257	95	.112359218	R-squared	= 0.9273
				Adj R-squared	= 0.9250
Total	146.819376	98	1.4981569	Root MSE	= .3352

ln_x	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Pend	.1272581	.0251679	5.06	0.000	.0772936	.1772226
Kor	.4694328	.0324275	14.48	0.000	.4050562	.5338095
GPI	.0961095	.1187854	0.81	0.420	-.1397094	.3319285
_cons	5.247135	.3040634	17.26	0.000	4.643493	5.850778

Appendix 3

Fixed Effect Model Methods

```
. xtreg ln_x Pend Kor GPI, fe

Fixed-effects (within) regression               Number of obs      =        99
Group variable: id                              Number of groups   =         9

R-sq:                                           Obs per group:
     within  = 0.8305                                         min =        11
     between = 0.8142                                         avg =      11.0
     overall = 0.8144                                         max =        11

                                                F(3,87)            =    142.10
corr(u_i, Xb)  = 0.1278                         Prob > F           =    0.0000
```

ln_x	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Pend	.3709692	.0254585	14.57	0.000	.3203676	.4215708
Kor	.1051283	.0199597	5.27	0.000	.0654563	.1448003
GPI	.0237214	.0919349	0.26	0.797	-.1590092	.2064519
_cons	4.904797	.2524916	19.43	0.000	4.402942	5.406651
sigma_u	.55745971					
sigma_e	.06358646					
rho	.98715635	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(8, 87) = 319.12                     Prob > F = 0.0000
```

Vol. 4, No. 06; 2020

ISSN: 2456-7760

Appendix 4

Random Effect Model Regression

```
. xtreg ln_x Pend Kor GPI, re

Random-effects GLS regression                   Number of obs     =         99
Group variable: id                              Number of groups  =          9

R-sq:                                           Obs per group:
     within  = 0.8300                                         min =         11
     between = 0.8214                                         avg =       11.0
     overall = 0.8214                                         max =         11

                                                Wald chi2(3)      =     458.42
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

ln_x	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Pend	.3654512	.0251072	14.56	0.000	.316242	.4146604
Kor	.1145735	.0204693	5.60	0.000	.0744545	.1546925
GPI	.0083552	.0932233	0.09	0.929	-.1743591	.1910695
_cons	4.941962	.2900147	17.04	0.000	4.373544	5.51038
sigma_u	.39968147					
sigma_e	.06358646					
rho	.97531427	(fraction of variance due to u_i)				