PROSIDING PERKEM 10, (2015) 211 – 217
ISSN: 2231-962X

Gross Domestic Product (GDP) Relationship with Human Development Index (HDI) and Poverty Rate in Malaysia

Nur Athirah Binti Mohamad Roshaniza
Masters Student
Faculty of Economics and Management
Universiti Kebangsaan Malaysia
Email: tyaija0141@gmail.com

Doris Padmini Selvaratnam
Associate Professor Dr. (Ph.D)
Faculty of Economics and Management
Universiti Kebangsaan Malaysia
Email: pegasus@ukm.edu.my

ABSTRACT

This study discusses the relationship between Growth Domestic Products (GDP), Human Development Index (HDI) and poverty rate in Malaysia from 1990 to 2012. The results in this study shows HDI and poverty rate have a relationship with GDP. The HDI and poverty rate have relationship with GDP in the long term. HDI and GDP have a negative relationship in the long term while poverty rate and GDP has a positive relationship with the GDP. Meanwhile in the short term, HDI and GDP have no relationship but poverty rate and GDP has a relationship with GDP but it is a negative relationship.

Key words: Growth Domestic Products (GDP), Human Development Index (HDI), poverty rate, Malaysia

INTRODUCTION

Human Development Index (HDI) is one of a variable that can influence the Gross Domestic Product (GDP). Human Development Index can help to measure the country achievements in different areas and what we took is from health, education and standard of living. We actually want to see what is the relationship between GDP with HDI is and the poverty rate in Malaysia, we are using a secondary data from year 1990 until year 2012. In this paper we are going to investigate the relationship between Human Development Index and Gross Domestic Product, identify another factor that could affect GDP which is Poverty reduction. There is a relationship between Gross Domestic Product (GDP) and Human Development Index (HDI). The component of Human Development Index (HDI) includes health, education, and standard livings. Is there having the relationship between GDP and HDI? We want to see whether another factor such as the poverty rate could affect the GDP of the country. In this study we want to investigate the relationship between Gross Domestic Product and Human Development Index and to identify another factor that could affect GDP, for example Poverty rate.

LITERATURE REVIEW

Shome and Tondon (2010) study Balancing human development index with the economic growth: A study of Asean 5', had investigated the movement of the two parameters GDP and HDI and check if there exists a significant correlation between their trends. The state that higher levels of output can be redirected into higher spending on education, health and poverty alleviation which will eventually impact the productivity of the citizens leading to higher growth. It means, the higher the economic growth by increased level of output, the higher the spending on HDI and poverty alleviation programmes. The relationship between economic growth and human development indicators such as poverty rate, health and education outcomes can be analyzed by both in terms of long-term trends and short-term fluctuations as stated by Conceicao, et. al. (2009) in 'Economics shocks and human development: A review of empirical findings'. This study indicates that at the aggregate level and over the long-run, there is a strong positive (though not linear) correlation between GDP per capita and HDI. Economic growth helps to generate the resources needed for improved human development, and

enables higher potential growth. Researchers Stevans & Sessions (2008) in 'The Relationship Between Poverty and Economic Growth Revisited' had investigated the dynamic relationship between economic growth and poverty in the context of a formal, error correction model and also include a measure of income inequality as a determinant of poverty. They found that the effect of growth in GDP on poverty growth has either diminished or remained unchanged over time and the 1980s economic expansion in the U.S. had no affect on poverty. Using a formal error-correction model, their found that increase in economic growth are significantly related to reductions in the poverty rate for all families. According by Azielotta and Selvaratnam (2014) and Azielotta. et. al. (2015) note that the gini coefficient alone cannot reflect the overall ethnic distribution of income, other components need to be taken into account such as ethnic participation in the formal or informal economic sector and also the property ownership by ethnicity. Akbar (2010)'s study 'Relationship between GDP and Human Development Indices in India' used three indices that contribute to Human Development Indices. According to previous research done by Akbar there is positive relationship between GDP and HDI. However, we found out that the researcher is only using five years data and in our opinion we should take at least 30 years data to get more accurately result. Overall in this study, we have found that GDP have a positive relationship with the HDI. The education index is the greatest impact on domestic growth Human Development Index and increases in economic growth are significantly related to reductions in the poverty rate for all families.

METHODOLOGY

This research aims to investigate the relationship between Gross Domestic Product (GDP) and Human Development Index (HDI) in Malaysia over 20 years from 1990 until 2012. Our series data are collected from World Bank, Malaysia Economic Statistics and Human Development Report Office United Development Programme (UNDP).

Econometric model

In our case study, the dependent variables will be Gross Domestic Product (GDP) and independent variables are Human Development Index (HDI) and poverty rate in Malaysia. The economic model that we use is the multiple regression models. The equation is:

$$GDP = B_0 + B_1HDI + B_2PR + €$$

Whereby,

GDP = Gross Domestic Product
B_0 = The GDP intercept or the value of GDP when B_1 and B_2 are equal to zero.
B_1HDI = Human Development Index
B_2PR = Poverty Rate.
€ = error term.

The Data

The Gross Domestic Product data are taken from Malaysia Economic Statistics. The proxy of GDP is GDP per capita. The poverty rate data are taken from World Bank. The proxy of poverty rate is poverty headcount ratio at national poverty lines (% of population). Besides that, the data for HDI are taken at United Nation Development Programme (UNDP). However, there are shortages of data for the HDI during 1985 and 1995.

<u>The estimation and inference procedures</u>

To estimate the parameters of the two variable regression model we use the Ordinary Least Square (OLS) model to examine the data to know the relationship between the variables in the model. We will do hypothesis testing which is foundation for all inference variable in classical econometrics. We will use the T- test to estimate the value for test statistic which will be used to decide whether to reject the null hypothesis or accept the null hypothesis.

Hypothesis 1

$H_0 : B_1 = 0$ Relationship between Human Development Index and GDP

$H_1 : B_1 \neq 0$ No relationship between Human Development Index and GDP
Hypothesis 2
$H_0 : B_2 = 0$ Relationship between Poverty Rate and GDP
$H_1 : B_2 \neq 0$ No relationship between Poverty Rate and GDP

EMPIRICAL RESULTS

Hypothesis 1

$H_0 : B_1 = 0$ Relationship between Human Development Index and GDP
$H_1 : B_1 \neq 0$ No relationship between Human Development Index and GDP

Hypothesis 2
$H_0 : B_2 = 0$ Relationship between Poverty Rate and GDP
$H_1 : B_2 \neq 0$ No relationship between Poverty Rate and GDP
According to the table 1.1, the t-statistics value is 4.411 more than critical value 2.000 and is the 0.000 possibility that less than 0.05% indicates that the null hypothesis is rejected. This shows that there is a highly significant relationship between GDP and HDI. Thus, we can accept the alternate hypothesis. Meanwhile the t-statistics for 3.917 is greater than 2.000 and 0.001 possibility that less than 0.05% indicates that we must reject the null hypothesis. There is a highly significant relationship between GDP and poverty rate. So, we accept the alternative hypothesis. The R^2 0.877 showed only 87.7% of GDP was explained by HDI and poverty rate and the remaining 12.3% was explained by other factors that were not included in this model. The Durbin Watson 0.505 is lower than critical value indicate that the data got autocorrelation and also non stationary and unit root test should be carried out in order to check whether the variable is non stationary or not and also make the data is stationary with integrating first level or second level.

Hypothesis 1

$H_0 : B_1 = 0$ GDP not stationary
$H_1 : B_1 \neq 0$ GDP is stationary

Hypothesis 2

$H_0 : B_2 = 0$ HDI not stationary
$H_1 : B_2 \neq 0$ HDI is stationary

Hypothesis 3

$H_0 : B_3 = 0$ Poverty rate not stationary
$H_1 : B_3 \neq 0$ Poverty rate is stationary

Based on the table 1.2, the GDP variable is stationary at 2^{nd} differ because we can reject the null hypothesis (H_0) with 1%, 5% and 10% level of significant and the ADF t absolute value (5.622) is greater than t-values (3.887), (3.052), and (2.667) at integrated level 2. So, we can conclude that the data are stationary. For HDI variable, we also can reject null hypothesis with 1%, 5% and 10% level of significant because the ADF t absolute value (5.839) is more than the t-value (3.959), (3.081) and (2.681) at integrated level 2. We can conclude that the data is stationary. Meanwhile, for poverty rate variable, we can reject null hypothesis with 1%, 5% and 10% level of significant because the ADF t absolute (5.839) is more than t-value (3.959), (3.081) and (2.681) at integrated level 2 and the data is stationary.

Johnsen Cointegration Test

From the table 1.3, the estimated trace statistics value 34.627 is more than critical value at 5% significant level (29.797). This shows there is one cointegrating equation between GDP, HDI and poverty rate. This means there is a long run relationship between GDP, HDI and poverty rate.

From table 1.4, the estimated Max-Eigen statistics 28.574 is greater than critical value at 5% significant level 21.132. This also means there is a long run relationship between GDP, HDI and poverty rate.

The estimated t-value for HDI (4.691) is greater than critical t-value of t (2). Therefore HDI is significant in explaining the changes in GDP at 5% significant level. The estimated t-value of poverty rate (21.744) is more than critical t-value of t (2). So, poverty rate can explain the changes in GDP at 5% significant level. Therefore, HDI and poverty rate have a long run relationship with GDP.

Based on table 1.6, we can conclude that HDI has no short term relationship with GDP because the t-statistics 0.396 is less than the critical value 2.000. But for the poverty rate, it has a short term relationship between GDP because the t-statistics 2.421 is more than critical value 2.000.

CONCLUSION

This study was conducted to investigate the relationship between GDP and HDI and also poverty rate by using OLS and ADF. This study also examines the whether the HDI and poverty rate have a long term relationship and short term relationship by using Johnsen Cointegration Test method for the long term and Vector Error Correction Estimate for the short term. The findings showed that the HDI and poverty rate has relationships with GDP in the long term. HDI and GDP have a negative relationship in the long term while poverty rate and GDP has a positive relationship with the GDP. Meanwhile in the short term, HDI and GDP have no relationship but poverty rate and GDP has a relationship with GDP but it is a negative relationship. Based on this research topic that to investigate the relationship between growth domestic product (GDP) and human development index (HDI) in Malaysia, we expect that there are positive relationships between both variables. The previous researched done by Shome and Tondon (2010) had found that the increasing in each parameter in HDI will lead to the increasing of GDP and their study are been done for economic growth of ASEAN 5 countries including Malaysia. But in this study HDI and GDP has negative relationship. This is also proven by Boozer, et. al. (2003) in their research which state that there is strong positive relation between the parameter of HDI and economic growth. Using the estimation of T-test value, we will accept null hypothesis which consider that there have a relationship between Human Development Index and GDP, and the relationship between those variables are positively. For poverty rate it has negative relationship with GDP. It also proved by Lonnie and David (2008) in their research 'The Relationship between Poverty and Economic Growth Revisited', the increases in poverty rate will lead to the decreases of gross domestic product. All of this occurs due to the decreasing of purchasing power of the society especially for those who have low income and this will affect the GDP. We will accept null hypothesis which state that there are relationship between poverty reduction and GDP but in negative relationship. The problem with this study is that, we are only using three components of HDI that is health, education and standard of living. There are other variables which is poverty that can affect our country's GDP. One may add more variables, change or add component in HDI as stated by Boozer, et. al. (2003) in 'Paths to Success: The Relationship between Human Development and Economic Growth' as consisting of health, nutrition and education levels of the population and keep up with the years.

ACKNOWLEDGEMENT

This paper is a result of coursework research exercise for the subject EPPE6154 Economics of Social Policy, Semester 2 Session 2014/2015 at School of Economics, faculty of Economics and Management, Universiti Kebangsaan Malaysia.

REFERENCES

Azielotta Ak Wilson Temi, Doris Padmini Selvaratnam. 2014. Economic growth and income distribution based on ethnicity Malaysia. Proceedings of the Indonesia International Conference on Economics, Management and Accounting (MIICEMA) 2014 / Fakulti Ekonomi dan Pengurusan, UKM. 219-240

Azielotta Ak Wilson Temi, Doris Padmini Selvaratnam, Norlaila Abu Bakar. 2015. Malaysia's Economic Growth And Income Distribution Based On Ethnicity. Proceedings of the Kuala Lumpur International Business, Economics and Law Conference (KLIBEL) 7,Vol. 3: 2-11.

Boozer, M, Ranis, G, Stewart, F, Suri, T. (2003). Paths to Success: The Relationship between Human Development and Economic Growth. Centre Discussion Paper 874. Economic Growth Center, Yale University. http://www.econ.yale.edu/growth_pdf/cdp874.pdf

Conceicao, P, Kim, N, Zhang, Y. (November 2009). Economic Shocks and Human Development: A Review of Empirical Findings. Office of Development Studies, United Nations Development Programme, New York.

Government of Malaysia. 2013. Malaysia Economic Statistics-Time Series. Department of Statistics Malaysia, Official Portal – www.statistics.go.my

Khodabakhshi, A. (2011). Relationship between GDP and Human Development Indices in India. International Journal of Trade, Economics and Finance, 2, 3, 251-253. http://www.ijtef.org/papers/vol2no3-Contents.pdf

Shome, S & Tondon, S. (2010). 'Balancing human development index with the economic growth: A study of Asean 5. Annals of the University of Petrosani, Economics. http://scholar.qsensei.com/content/1plz1h

Stevans, LK, & Sessions, DN. (2008). The Relationship Between Poverty and Economic Growth Revisited. Journal of Income Distribution. 17(1), pp. 5-20. http://econwpa.repec.org/eps/ge/papers/0502/0502002.pdf

World Bank – http://data.worldbank.org Human Development Report Office United Development Programmed (UNDP) - http://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS/countries?page=6

TABLE 1.1 Ordinary Least Square Test (Multiple Regressions)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8808.098	8861.862	-0.993933	0.3321
HDI	48747.61	11050.95	4.411168	0.0003
POV	-904.9959	231.0656	-3.916619	0.0009

R-squared	0.877275	Mean dependent var	17127.13
Adjusted R-squared	0.865003	S.D. dependent var	7824.178
S.E. of regression	2874.757	Akaike info criterion	18.88643
Sum squared resid	1.65E+08	Schwarz criterion	19.03454
Log likelihood	-214.1940	Hannan-Quinn criter.	18.92368
F-statistic	71.48314	Durbin-Watson stat	0.505400
Prob(F-statistic)	0.000000		

TABLE 1.2 Augmented Dickey-Fuller (ADF) Test

			Growth Domestic Product GDP			Human Development Index HDI			Poverty Rate		
			Level	1st differ	2nd differ	Level	1st differ	2nd differ	Level	1st differ	2nd differ
Augmented Dickey-Fuller test statistic			0.961	-5.200	-5.622	-0.780	-4.642	-5.839	-1.824	-1.666	-5.839
Test critical values:	1% level		-3.770	-3.809	-3.887	-3.770	-3.809	-3.959	-3.780	-3.920	-3.959
	5% level		-3.005	-3.021	-3.052	-3.004	-3.021	-3.081	-3.005	-3.066	-3.081
	10% level		-2.642	-2.650	-2.667	-2.642	-2.650	-2.681	-2.642	-2.673	-2.681

TABLE 1.3 Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.777733	34.62716	29.79707	0.0129
At most 1	0.250578	6.053482	15.49471	0.6892
At most 2	0.029701	0.572877	3.841466	0.4491

TABLE 1.4 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.777733	28.57368	21.13162	0.0037
At most 1	0.250578	5.480605	14.26460	0.6803
At most 2	0.029701	0.572877	3.841466	0.4491

TABLE 1.5 Normalized cointegrating coefficients (standard error in parentheses)

LOG(GDP(-2))	LOG(HDI(-2))	LOG(POV(-2))
1.000000	-0.638200	0.847897
	(0.13605)	(0.03918)

R = -0.638 + 0.848
(0.136) (0.039)
Estimated-t
HDI 0.638/0.136 = 4.691
POV 0.848/0.039 = 21.744

Table 1.6 Vector Error Correction Estimates

	LOG(GDP(-2))	LOG(HDI(-2))	LOG(POV(-2))
LOG(GDP(-3))	0.937964	0.095051	-1.426511
	(0.29387)	(0.23976)	(0.58928)
	[3.19174]	[0.39645]	[-2.42077]
LOG(GDP(-4))	0.228419	0.044769	-0.689153
	(0.30154)	(0.24601)	(0.60465)
	[0.75751]	[0.18198]	[-1.13975]
LOG(HDI(-3))	-0.638475	0.621200	2.718023
	(0.42416)	(0.34606)	(0.85055)
	[-1.50525]	[1.79508]	[3.19562]
LOG(HDI(-4))	0.601480	0.031948	-1.423969
	(0.32712)	(0.26689)	(0.65596)
	[1.83869]	[0.11971]	[-2.17082]

LOG(POV(-3))	0.124438	0.145356	-0.170886
	(0.11652)	(0.09506)	(0.23365)
	[1.06796]	[1.52904]	[-0.73138]
LOG(POV(-4))	0.063415	-0.099715	-0.616644
	(0.12011)	(0.09799)	(0.24084)
	[0.52799]	[-1.01760]	[-2.56037]
C	-1.889465	-1.548862	24.23921
	(2.98974)	(2.43920)	(5.99510)
	[-0.63198]	[-0.63499]	[4.04317]

APPENDIX

Tahun	GDP RM (million)	HDI Value	Poverty headcount ratio at national poverty lines (% of population)	GDP PER CAPITA (RM)
1990	119081	0.58	16.5	6578
1991	135124	0.58	16.5	7285
1992	150682	0.58	12.4	7903
1993	172194	0.58	12.4	8785
1994	195461	0.58	12.4	9704
1995	222473	0.58	8.7	10757
1996	253732	0.58	8.7	11956
1997	281795	0.58	6.1	12945
1998	283243	0.58	6.1	12682
1999	300764	0.58	8.5	13128
2000	356401	0.72	8.5	15169
2001	352579	0.72	8.5	14672
2002	383213	0.72	6	15614
2003	418769	0.72	6	16725
2004	474048	0.72	5.7	18560
2005	543578	0.75	5.7	20870
2006	596784	0.75	5.7	22478
2007	665340	0.75	3.6	24589
2008	769949	0.76	3.6	27929
2009	712857	0.76	3.8	25385
2010	797327	0.77	3.8	27890
2011	884456	0.77	3.8	30433
2012	941237	0.77	1.7	31887

Source: various sources.