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Long Run Relationship between Income Inequality and Economic Growth: Evidence from Malaysia

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Abstract
The aim of present study is to investigate the existence of a long run relationship between income inequality and economic growth in Malaysia. The study has employed annual time series data over the period of 1970 up to 2014. This study is conducted by utilizing the Autoregressive Distributive Lag (ARDL) techniques. ARDL bounds testing approach has been used for cointegration and error correction method (ECM). The unit root problem is handled by the use of ADF unit root test. The findings of our analysis are contrasted to the significant association between income inequality and economic growth found by Alesina and Roderick (1994) and by Persson and Tabellini (1994). To the best of our knowledge, this study seems to be a good and unique contribution in literature with reference to Malaysia. This study is one of pioneering attempt that employs ARDL cointegration approach for this income inequality issue in Malaysia.
Keywords: Income Inequality, Gini Index, ARDL, Economic Growth

Introduction

Malaysia's economic development has given significant impact on income distribution and poverty. Although the poverty rate has decreased, the income distribution still shows a trend that is not stable. Official data figures show the poverty rate in Malaysia has declined steadily but the distribution of income shows the fluctuation trend. Based on the value of the Gini coefficient which ranges from 0 to 1, the lower this value, an equal distribution of income.

The government is recommended to implement a strategy to increase the income and wealth of households B40, address the rising cost of living and strengthen delivery mechanisms to support households B40. This can be seen in the Tenth Malaysia Plan (10MP), 2011-2015, inclusive is a key strategy to achieve a prosperous and fair society. Implementation of development programs and empowerment for the targeted group have resulted in improved socio-economic status of the people of Malaysia. The overall income distribution has improved as indicated by a reduction in the Gini coefficient from 0.441 in 2009 to 0401 in 2014, surpassing the 2015 target of 0.420. The average monthly household income B40 increased from RM1,440 in 2009 to RM2,537 in 2014. The provision of basic rural infrastructure, as well as entrepreneurship development activities, have enabled people in rural and remote areas to increase the participation in socio-economic development. Focuses on the development of regional economic corridor has attracted investment and job creation, particularly in less developed regions. Despite these achievements, more efforts should be made to ensure that the benefits of growth are enjoyed by all household income group.

Therefore, economic growth and distribution of income or wealth inequality are two important issues, which are concerned with economic development. This territory is staked out by founding scholars. Adam Smith (*The Wealth of Nations, 1776*) discussed the first issue while David Ricardo (*Principles of Political Economy, 1814*) concerned with the second. Both topics were until neglected in the mainstream of macroeconomics. More than six decades ago the relationship between economic growth and income inequality had captured the attention of the line of work in the world. The seminal work of Kuznets (1955) is both important and controversial. Simon Kuznets (1955) has documented that income distribution is equal in industrialized countries than in developing or agrarian economies. In the course of development, income distribution first becomes more unequal, goes to its peak but later there is a tendency for income to become less unequally distributed with increasing per capita income (Paukert, 1973). So it is called Kuznets hypothesis, which is explained by using the inverted-U-shaped curve.

Previous studies have documented different results when considering rich and poor countries, regions versus nations and cross-sectional versus time series evidence (Partridge, 2005). One possible explanation for such conflicting findings is that inequality's impact on growth can vary greatly depending on economic conditions. It is even possible that inequality limits growth at the *national* scale while it is associated with an increase in economic incentives at the regional/local level, where most of the factors (labour) are exceedingly mobile [Sylwester, (2000); Wan, (2002); Knowles, (2003); Moran and Korzeniewicz, (2005); Angeles-Castro, (2005, 2006) and, Partridge, 2006). This paper explores the existence of long run relationship between income inequality and economic growth in Malaysia.

This paper aims to fill the gap in the literature by empirically examining the long run relationship between income inequality and economic growth in Malaysia by using time series estimation model namely Auto Regressive Distributed Lag (ARDL). Aside from empirical methodology, this paper aim to contribute to the literature in the following ways. First, this paper consider various dimension of factors that might influence the relationship between income inequality and economic growth. For example, apart from real income per capita, we might consider the education, openness to trade and also foreign direct investment (FDI) as potential factors that might affect income inequality. Undertaking such approach also allows us to prescribe different policy recommendations based on different dimension measures. Second, this paper uses a longer time series data over the period 1970-2014 which consisted of 45 years of observation. The econometric results from time series regression model supports the

Kuznets hypothesis that initial increase in GDP per capita will lead to increase in income inequality. Meanwhile, education and FDI will improve income inequality in the long run and in contrary, openness to trade will increase income inequality in the long run.

The rest of the paper is organized as follows. Section 2 provides a brief literature on the link between income inequality and economic growth. Section 3 explains the econometric methodology and describes the data. Section 4 presents the econometric findings. Finally, Section 5 concludes by discussing policy implications of our findings.

Literature Review

Economist Simon Kuznets argued that levels of economic inequality are in large part the result of stages of development. According to Kuznets, countries with low levels of development have relatively equal distributions of wealth. As a country develops, it acquires more capital, which leads to the owners of this capital having more wealth and income and introducing inequality. Eventually, through various possible redistribution mechanisms such as social welfare programs, more developed countries move back to lower levels of inequality.

Plotting the relationship between the level of income and inequality, Kuznets saw middle-income developing economies level of inequality bulging out to form what is now known as the Kuznets curve. Kuznets demonstrated this relationship using cross-sectional data. However, more recent testing of this theory with superior panel data has shown it to be very weak. Kuznets' curve predicts that income inequality will eventually decrease given time. As an example, income inequality did fall in the United States during its High school movement from 1910 to 1940 and thereafter. However, recent data shows that the level of income inequality began to rise after the 1970s. This does not necessarily disprove Kuznets' theory. It may be possible that another Kuznets' cycle is occurring, specifically the move from the manufacturing sector to the service sector. This implies that it may be possible for multiple Kuznets' cycles to be in effect at any given time.

Education can play an important role in reducing income inequality, as it determines the occupational choice, access to jobs, and the level of pay, and plays a pivotal role as a signal of ability and productivity in the job market. From a theoretical perspective, the human capital model of income distribution (Mincer, 1958; Becker and Chiswick, 1966) suggests that while there is an unambiguously positive association between educational and income inequality, the effect of increased educational attainment on income inequality could be either positive or negative depending on the evolution of rates of return to education (that is, the skill premium). Moreover, there can be opposing forces at play stemming from “composition” (that is, increasing the share of high-wage earners) and “wage compression” (that is, the decline in the returns to higher education relative to lower levels) effects. Overall, the evidence suggests that the inequality impact of education depends on various factors, such as the size of education investments by individuals and governments and the rate of return on these investments. It is in this spirit that Rajan (2013) notes that “prosperity seems increasingly unreachable for many, because of a good education, which seems to be today's passport to riches, is unaffordable for many in the middle class."

Trade has been an engine for growth in many countries by promoting competitiveness and enhancing efficiency. Nonetheless, high trade and financial flows between countries, partly enabled by technological advances, are commonly cited as driving income inequality. In advanced economies, the ability of firms to adopt labour-saving technologies and offshoring has been cited as an important driver of the decline in manufacturing and rising skill premium (Feenstra and Hanson 1996, 1999, 2003). Trade openness could potentially have mixed effects on the wages of unskilled labour in advanced countries. It raises the skill premium, but could also increase real wages by lowering (import) prices (Munch and Skaksen 2009). At the same time, increased trade flows could lower income inequality by increasing demand and wages for abundant lower-skilled workers. Thus, disentangling the impact of trade on inequality is challenging as it depends on relative factor abundance and productivity differences across countries, and the extent to which individuals obtain income from wages or capital.

Reuveny and Li (2003) presented several reasons on how foreign direct investment (FDI) inflows might increase income inequality in a host nation. First, Multi-National Companies (MNCs) can exert pressure on host governments to cut welfare expenditure and curb labour unions to reduce wages, both of which will have an adverse effect on lower and middle classes. Second, MNCs' repatriations of profits from less developed countries (LDCs) causes underdevelopment and hurt the poor. Third, the capital- intensive techniques utilized by the MNCs is thought to promote unemployment among unskilled labourers, and to distort income distribution by creating an economy with a small advanced sector and a large backward sector [Muller, (1988), Lall (1985), Jenkins (1996), Robbins (1996), Nafziger (1997), Reuveny and Li (2003) and Sylwester (2005)]

This is akin to Feenstra and Hanson (1997)'s argument that FDI inflows into developing nations cause higher wages for skilled than unskilled workers, resulting in widening income inequalities. On the other hand, there are also several reasons on why FDI inflows might improve income inequality. First, MNCs provide developing nations with capital and technology, improve their corporate governance, and propagate better management practices. These forces, in turn, raise productivity and promote economic growth [Hanad and Harrison (1993), OECD (1994), Markusen and Venables (1999),) and Reuveny and Li (2003)]. Dollar and Kraay (2000) also supported this view in which economic growth though raises the income of the poor proportionally more than that of the rich, making FDI useful for reducing poverty (Stiglitz, 1998). If FDI increases the demand for unskilled workers or provides economic opportunities for those who would otherwise employ, then host FDI nations would experience an improvement in income inequality (Sylwester, 2005, Mundell, 1957).

Methodology

Using data from 1970 to 2014, the paper implements the Auto Regressive Distributed Lag (ARDL) bounds testing approach to cointegration to examine the existence of long-run relationships; and the error correction model (ECM) for the short run relationships. Stationarity properties of the series are tested by the Augmented Dickey-Fuller (ADF) and the Phillip-Perron (PP) unit root test. In this study, the short and long-run dynamic relationships between income inequality and economic growth are estimated by using the newly proposed ARDL bound testing approach which was initially introduced by Pesaran et al. (1996). The ARDL has numerous advantages.

Firstly, unlike the most widely used method for testing cointegration, the ARDL approach can be applied regardless of the stationarity properties of the variables in the samples and allows for inferences on long-run estimates, which is not possible under the alternative cointegration procedures. In other words, this procedure can be applied irrespective of whether the series are I(0), I(1), or fractionally integrated (Pesaran and Pesaran 1997); and Bahmani-Oskooee and Ng, 2002), thus avoids problems resulting from nonstationary time series data (Laurenceson and Chai, 2003). Secondly, the ARDL model takes sufficient numbers of lag to capture the data generating process in a general-to-specific modelling framework (Laurenceson and Chai, 2003). It estimates (p+1)k number of regressions in order to obtain optimal lag length for each variable, where p is the maximum lag to be used, k is the number of variables in the equation. Finally, the ARDL approach provides robust results for a smaller sample size of cointegration analysis. Since the sample size of our study is 39, this provides more motivation for the study to adopt this model.

By combining the ideas from few school of thoughts, we choose the most prominent independent variable such as FDI, Trade Openness, Education and Income per capita to investigate the impacts of these variables towards the income distribution in Malaysia. The resulting estimation model applied in the present study is as follows:

$LGINI= \beta_0 + \beta_1 LGDP_1 + \beta_2 LEDU_2 + \beta_3 LOPEN_3 + \beta_4 LFDI_4 + \varepsilon_i$ …………(1)

Where;

LGINI = Gini Index

LGDP = Real income per capita

LEDU = Secondary enrolment

LOPEN = Trade openness

LFDI = Foreign direct investment

Ɛ= Error term

Time series data from 1970 to 2014 for all the variables are obtained from the World Development Indicator database, Central Bank of Malaysia and Department of Statistics, Malaysia. The present study employs the Autoregressive Distributed Lag (ARDL) approach of Pesaran et al. (2001) to determine the presence of relationships between the variables examined and the relationship pattern of these variables. The ARDL approach is chosen since it can accommodate a greater number of variables and allows for inferences on long run estimates which are not possible under other cointegration procedures. Additionally, the ARDL approach can be applied irrespective of whether the regressors are purely I(0), I(1) or mutually cointegrated. Furthermore, the ARDL approach is more robust for a study with a small sample (Pesaran et al., 2001).

The ARDL approach involves four principal steps, as well as including tests that must be performed. The first step is to ensure that all time series data are purely stationary. For this purpose, unit root tests are conducted that examine the time series characteristics of the selected variables to overcome the problems of spurious correlation often caused by non-stationary time series data. The present study applies two unit root tests to ensure none of the variables is off I(2) or higher order: the Augmented Dickey-Fuller test (ADF) and the Phillips-Perron test (PP). Once the data are confirmed as stationary or found to be either I(0) or I(1), the second step is to test for cointegration among the variables in accordance with the ARDL approach. The third step is to test for the existence of long-run relationships among the variables; and the final step is to test for short-run relationships among the variables.

The present study utilizes the ARDL approach together with the computer software EViews 9. The error-correction version of ARDL model, following Pesaran and Shin (1997), is as follows:

$$\Delta\, LGINI_t = a_1 + \sum_{i=1}^{n} b_i\, \Delta LGINI_{t-i} + \sum_{i=1}^{n} c_i\, \Delta LGDP_{t-i} + \sum_{i=1}^{n} d_i\, \Delta LHC_{t-i} + \sum_{i=1}^{n} e_i\, \Delta LOPEN_{t-i} + \sum_{i=1}^{n} f_i\, \Delta LFDI_{t-i} + \gamma_1 LGINI_{t-1} + \gamma_2 LGDP_{t-1} + \gamma_3 LHC_{t-1} + \gamma_4 LOPEN_{t-1} + \gamma_5 LFDI_{t-1} + \varepsilon_t$$

.....................................(2)

Δ is the symbol of differentiation, the coefficients b, c, d, e, f and g of part one of the model (10) represent short-run dynamic, *γs* determines long-run relationship and *εt* is the white noise errors. The first step in the ARDL model is to examine the long-run relationships among the variables by employing the F-test. The null hypothesis for no cointegration for the variable $GINI_t$ against alternative hypothesis is given as:

H_0 $\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$ (no cointegration between the variables)
H_1 $\gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq \gamma_5 \neq 0$ (cointegration exists between the variables)

Since the F-test does not have a standard distribution, appropriate critical values are reported in Pesaran et al. (2001) for different numbers of regressors (4 in the present case) and whether the ARDL model contains intercept and/or trend terms. Two critical values are given for the upper critical bound and lower critical bound. If the calculated F-statistic is higher than the upper bound critical value, the null hypothesis of no cointegration is rejected. Rejection would imply the existence of a long-run relationship between the variables. If the calculated F-statistic is less than the lower bound critical value, then the null hypothesis of no cointegration cannot be rejected.

If the calculated F-statistic falls in between the lower and upper bounds' critical values, the test is inconclusive. Once cointegration is established, the conditional ARDL long-run model for can be estimated as:

$$LGINI_t = a_2 + \sum_{i=1}^{n} b_i \, LGINI_{t-i} + \sum_{i=1}^{n} c_i \, LGDP_{t-i} + \sum_{i=1}^{n} d_i \, LEDU_{t-i} + \sum_{i=1}^{n} e_i \, LOPEN_{t-i} + \sum_{i=1}^{n} f_i \, LFDI_{t-i} + \varepsilon_t$$

……………….(3)

This involves selecting the order of the ARDL models of the 5 variables using the Akaike Information Criterion (AIC). In the final step, short run dynamic parameters (ECM) are obtained by estimating an error correction model associated with the long run estimates. This is specified as follows:

$$\Delta \, LGINI_t = a_3 + \sum_{i=1}^{n} \partial_{1i} \, \Delta LGINI_{t-i} + \sum_{i=1}^{n} \partial_{2i} \, \Delta LGDP_{t-i} + \sum_{i=1}^{n} \partial_{3i} \, \Delta LEDU_{t-i} + \sum_{i=1}^{n} \partial_{4i} \, \Delta LOPEN_{t-i} + \sum_{i=1}^{n} \partial_{5i} \, \Delta LFDI_{t-i} + \partial ECM_{t-1} + \varepsilon_t$$

……………….(4)

Where, ∂_{1i}, ∂_{2i} ∂_{3i} ∂_{4i} and ∂_{5i} are the short-run dynamic coefficients of the model's convergence to equilibrium and is the speed of adjustment.

Data

The annual data for GDP per capita, FDI is retrieved from various sources such as World Bank Development Indicators and International Monetary Fund database. The GINI indexes, trade openness and secondary school enrolment in this study are gathered from the Department of Statistics Malaysia. The sample data collected span from 1970 to 2014 which consist of 45 years of observation.

Empirical Tests

Unit Root Test

The analysis begins with testing the unit root of every variable that can be viewed in Table 1. Unit root test Augmented Dickey-Fuller (ADF) test and Philip Perron test are applied to determine the order of integration of the variables for each income distribution models. This test is applied to ensure that no variable is integrated at I (2) and to avoid spurious results. Based on Table 1, the study confirmed that ADF and PP test showed that all the other independent variables, trade openness, secondary enrolment and the dependent variable, GINI were non-stationary and are off I(1) order with and without trend after the first differencing at mostly 1% significance level. Meanwhile, GDP per capita and FDI were at I (0) order with and without trend at level. The Autoregressive Distributed Lags (ARDL) technique requires that the dependent variable be of I(1) order with a mixed order of integration for the explanatory variables be permissible. Thus, unit root results render the ARDL technique to be valid in estimating Malaysian income distribution model.

Table 1: Results of ADF test for unit root test at level and first difference

	Variable	ADF		PP	
		Intercept	Intercept and trend	Intercept	Intercept and trend
Level	LGINI	-0.71767	-2.60874	-0.22852	-1.79741
	LGDP	-6.18905***	-6.13252***	-6.17611***	-6.11662***
	LEDU	-1.81262	-2.81578	-1.79549	-2.81578
	LTRADE	-1.87204	-0.37397	-1.4244	0.09782
	LFDI	-4.46434***	-4.40979***	-4.46788***	-4.40979***
First Difference	LGINI	-2.95583**	-2.97231	-2.49624*	-2.60174
	LGDP	-10.3498***	-10.2231***	-33.5521***	-34.7649***
	LEDU	-5.32732***	-5.27827***	-5.32732***	-5.26849***
	LTRADE	0.50534**	0.16469**	-4.95902***	-5.45047***
	LFDI	-8.72375***	-8.62716***	-12.215***	-12.2176***

Note: *******, ****** and ***** denotes rejection of null hypotheses (non stationarity for the ADF and PP) at 1%, 5% and 10% level. The optimal lag length is selected automatically using the Akaike Information Criteria for ADF test and the bandwidth is selected using the Newey–West method for the PP test.

Cointegration

Table 2 displayed the results of F-statistics for testing the existence of long-run relationship between the variables. It represents the results of the cointegration test among the variables using bound tests. The critical value is also reported in Table 2 based on critical value suggested by Narayan (2004) for a small sample size between 30 and 80. The test outcome of the significant levels of long-run relationship varies with the choice of lag length. The result gives an indication of the existence of the long-run relationship among the variables. Given the existence of a long-run relationship, in the next, ARDL cointegration method is used to estimate the parameters of equation (1) with a maximum lag order that is 3 to avoid the loss of degrees of freedom. Selection of lag length is based on the minimum value of Akaike Information Criteria (AIC).

The long run-relationship exist when the F-statistics are larger than the critical value at I (1) for each lag chosen. Results indicate that the calculated F-statistics for the model is higher than the upper bound critical value at 1%, 5%, and 10% level. Hence, the null hypothesis of no cointegration is rejected, implying the existence of long run cointegration relationships amongst the variables. This implies that the ECM version of the ARDL model is an efficient method for determining the long-run relationship among the variables. Once the existence of long run cointegration relationships is confirmed, the conditional ARDL for long-run model can be estimated. Consequently, there is a tendency for the variables to move together towards the long-run equilibrium.

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Table 2: F-statistics for testing the existence of long run relationship

F-statistics	Lag	Significant level	Bound critical values (unrestricted intercept and no trend)	
			I (0)	I(1)
4.314788	3	1%	3.29	4.37
		5%	2.56	3.49
		10%	2.20	3.09

Note: Number of independent variables (k) = 4

Tables 3 and 4 display the results of estimated long-run coefficients using the ARDL model and the results of the error correction model (ECM), respectively. The long run results of equation (1) based on AIC reported in Table 3 along with appropriate ARDL model. Results indicate that GDP per capita growth is associated negatively and insignificantly with income inequality. This suggests that higher economic growth does contribute to lower income inequality. Human capital indicator proxied by secondary enrolment demonstrate a highly significant negative relationship with GINI, which suggests that education will lower income inequality in the long run in Malaysia. Meanwhile, openness to economy is positively and significantly related to income inequality. This is caused by trade openness that is only benefited by a certain group of people especially the higher income group compared to lower income group. FDI is associated negatively and significantly with GINI suggest that higher FDI inflows will lower the income inequality in Malaysia.

Table 3 Estimated long run coefficients

	ARDL (2,2,3,1,3) selected. Dependent variable is GINI			
Variable	Coefficient	Standard Error	T-statistics	Prob.
Constant	1.31856	0.137993	9.555242	0.0000
GDP	-0.01226	0.009997	-1.22669	0.2309
EDU	-0.2691	0.043364	-6.20568	0.0000
OPEN	0.090584	0.02537	3.57047	0.0014
FDI	-0.02973	0.012899	-2.30471	0.0294

After the investigation of long-run relationships among the variables, to obtain the short dynamics of these variables, short-run version of ARDL is estimated and results are presented in Table 4. The coefficient of ECM term shows the speed of adjustment from short run to long run equilibrium. The sign of ECM coefficient should be negative with a high level of significance, for example significant at 1% level of significance. It is further proof of the existence of stable long run relationship Banerjee et al 1998). Indeed, it is argued that testing the significance of ECM_{t-1} is equal to -0.19321 for short run model respectively. This implies the deviation from short-run in income inequality is corrected by 19.321 percent over the each year in a long span of time. The lag length of short-run version of ARDL model is selected on the basis of AIC. Furthermore, the adjusted value of the ARDL model indicates that 82% of dependent variable is explained by the independent variable.

As for results in Table 4, short run dynamics results indicate that income inequality decreases with the GDP per capita growth means more GDP per capita growth caused more equality in income. The lagged GDP per capita growth has declining and significant income inequality impact. Meanwhile, increase in secondary enrolment is associated with decreasing income inequality but its lag has income inequality increasing impact with both significant and insignificant result. The result for openness to trade shows that increasing in openness to trade has a reduction and insignificant impact to income inequality. Finally, more FDI flows will bring positive and significant impact in improving the income inequality in Malaysia but its lags will worsen the income inequality in short run.

Table 4 Estimation of Restricted Error Correction Model (ECM)

ARDL (2,2,3,1,3) selected. Dependent variable is GINI				
Variable	Coefficient	Standard Error	T-statistics	Prob.
Constant	-0.0000333	0.001015	-0.0328	0.974
DGINI(-1)	0.48996	0.08712	5.623984	0.0000
DGDP	-0.00087	0.000534	-1.63655	0.1122
DGDP(-1)	-0.00117	0.000616	-1.89298	0.068
DEDU	-0.03251	0.010698	-3.03867	0.0049
DEDU(-1)	0.0194	0.011728	1.654124	0.1085
DEDU(-2)	0.028644	0.011477	2.495833	0.0183
DOPEN	-0.00255	0.006883	-0.37112	0.7132
DFDI	-0.00058	0.001026	-0.56397	0.577
DFDI(-1)	0.006188	0.001053	5.874443	0.0000
DFDI(-2)	0.003395	0.001035	3.280928	0.0026
ECM(-1)	-0.19321	0.031952	-6.04698	0.0000
R-squared = 0.823067	Adjusted R-squared = 0.758191		F-statistics = 12.68687***	

*** indicates significance at the 1% level.

Diagnostic Test

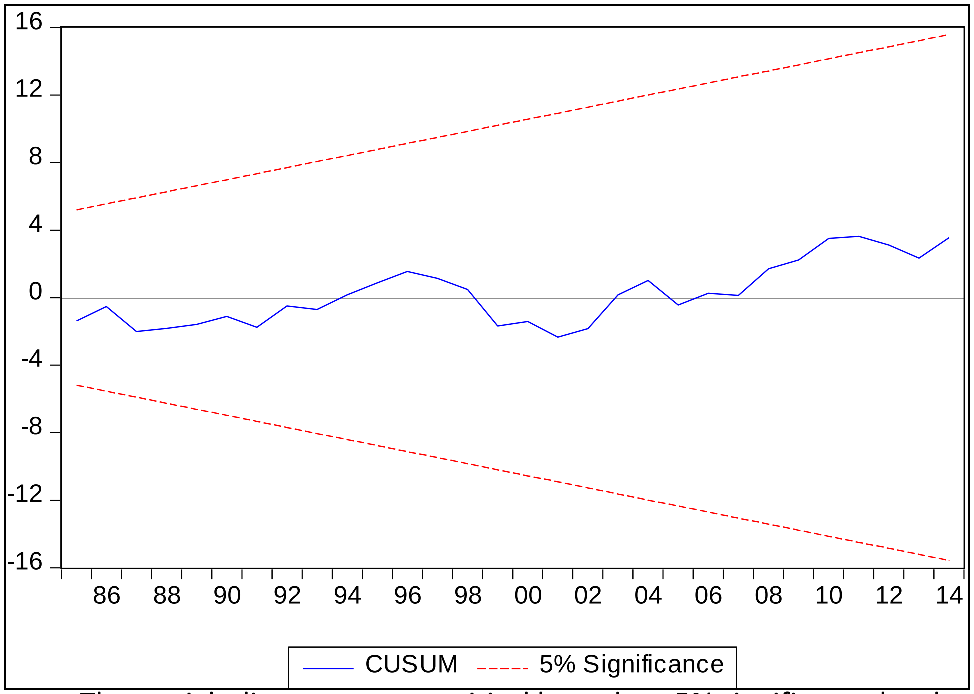
Table 5 displays the diagnostic tests of the ARDL model. Results indicate that the model does not have problems relating to autocorrelation, specification error using Ramsey RESET test, the normality of residuals or heteroscedasticity. Furthermore, Figures 1 and 2 of Cumulative Sum of Recursive Residual (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMQ) tests indicate no evidence of misspecification and instability during the period estimated by the model.

Table 5 Diagnostic Results

Test	Result
Autocorrelation	0.221659 (0.8026)
Heteroscedasticity	0.876923 (0.4245)
Ramsey RESET	1.544979 (0.2238)
Normality	1.186808 (0.552444)

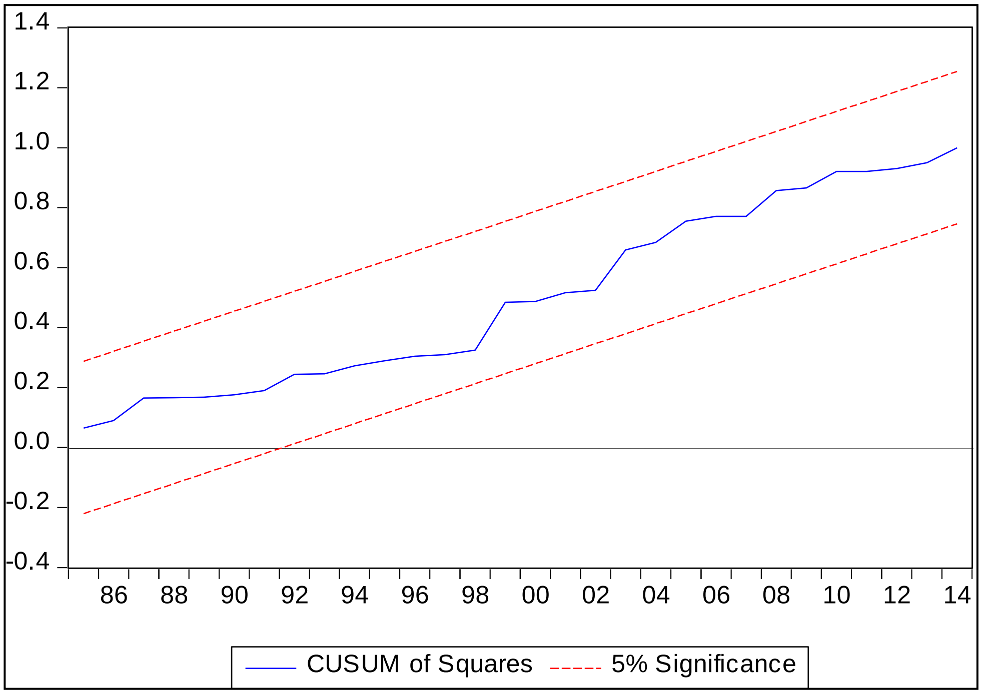
P value in parentheses

Figure 1 Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Figure 2 Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Conclusion

In this paper, we examine the long run and short run impact of income inequality on economic growth in Malaysia during the period 1970 to 2014. The empirical analysis is performed by using the bounds testing Autoregressive Distributed Lags (ARDL) approach. The bound test suggests that the variables included in the model designed in the present study are bound together in the long run.

Empirically, our baseline estimation and sensitivity analysis have shown that inequality is positively and insignificantly associated with economic growth in the long run and significant in the short run. Therefore, income inequality and economic growth in Malaysia supports the Kuznets hypothesis that initial increase in GDP per capita will lead to increase in income inequality. Coefficients estimate of education and foreign direct investment seem to improve income inequality in the country in both long run and short run. On contrary, openness to trade will increase income inequality in the long run.

In the context of policy implication, a key message is from the current study is that there is need of impending comprehensive policy to decline income inequality and reduce poverty in the country. The equal distribution of national income can handle the problem of high-income inequality and poverty. To reduce poverty and improve income distribution, there is need to allocate more attention on how to improve education and strengthen the human capital endowment to help to distribute income more equally. This can be achieved by a higher level of human capital creation that will increase incomes of lower segments of the population and make income distribution more equal.

How much FDI reduces poverty and income inequality in the country depend upon the nature of government policies and the effects of investment activities. These should be government attempts which direct the FDI to highly productive projects to reduce income inequality. The attempts must include macroeconomic and political stability and adequate skilled labour force among others. In such environment, development and the sound financial sector can contribute significantly to the process of economic development and in improving the income distribution.

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