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Long Run Relationship Between Financial Development, ICT and English Proficiency on Income Inequality Evidence from Malaysia

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Abstract

Income inequality is a persistent phenomenon and fundamental issues of concern especially in this new digital era because unequal access to finance has long been recognized as a critical mechanism for generating persistent income inequality. Mixed explanatory findings on past studies suggest that although financial development promotes economic growth, this does not necessarily benefit those on low-income in emerging countries. In addition, development of ICT is entwined with the role of English as a significant language which have played a part in the process of globalization and knowledge explosion. Nowadays ICT tools and approaches are being used widely due to their convenience, omnipresence, effectiveness and economy. Use of English language has become vital for better learning and earning. This study examines the role of financial development, ICT and English proficiency in influencing income inequality in Malaysia over the period of 1979-2016. The

empirical results based on ARDL bounds test indicated that financial development and English proficiency were seen to support the hypothesis that both factors can reduce the income gap in the long run. While ICT has shown different results, its improvement has only reduced the income gap for the short term. Hence the need for strengthening ICT policy is crucial as it can lead to development. Mastery of English is also seen as fostering economic resilience.

Keywords

Financial development, Income inequality, ICT, and English Proficiency

JEL Classifications: J11, F43

1. Introduction

Over the last two decades, Malaysia's economic development has benefitted from significant changes in the global economy brought out by the liberalisation, globalisation of finance and the flows of technology and information development. The development of ICT nowadays are vital components of modern infrastructure while the uses of the English language is also important in its widespread applications through world economies. The main features of these development are their rapid pace of technological improvement and their roles as innovation-enablers. The financial development in Malaysia has introduced sophisticated financial instruments that require advanced skills for proper use. The development of ICT allows for closer links between firms, customers, suppliers and collaboratives partners (Pradhan et al., 2015). It is generally agreed that development of financial system is associated to income inequality in a way that also depends on the creation of new knowledge in ICT and particular skills to boosts productive activities, generates opportunities and enhances welfare of poor people.

Based on the recent literature, Malaysia's economic development has made significant progress on poverty leviation but income distribution has still yet to be stabilised. Malaysia has always been sensitive to income distribution issue. Firstly is the concern about inequality between ethnic groups which dates back long before Malaysian independence when the British enforced the colonial labour policy of *"divide and rule"*. Secondly, in the aftermath of the bloody ethnic riots in May 1969 economic policies were shifted to focus on growth combined with more equitable income distribution among ethnic groups especially with the Malays. As shown in figure 1.0, the income inequality for Malaysia peaked in 1976 and fell thereafter to 1990. According to Shari (2000) and Law & Tan (2009) the general development policies implemented under the New Economic Policy (NEP) 1971-1990 exerted a major impact on reducing income inequality in Malaysia. However, since 1990 there is a trend towards widening of the income gap.

Shari (2000) stated that the government policy reversal towards liberalization, deregulation and privatization since the late 1980s has contributed to this trend of increasing inequality. Ragayah et al. (2000) also investigated the

hypothesis that increasing income disparity experienced in the 1990s was the result of the changing pattern of industrialization from labour-intensive to capital and technology-intensive. During the period of 1991-2000, the economy was driven by the National Development Policy (NDP), which sought to maximize economic growth through a policy that allowed for free play of market mechanisms and active participation of private sectors (Economic Planning Unit). The main goal of the NDP was its emphasis on sustaining economic progress in order to achieve the status of a fully developed nation by 2020 as envisaged in the long-term plan *Vision 2020*. These policy reforms were accompanied by the role of private sectors played in the market to improve efficiency and productivity in investment. It is argued that, the imbalance in income disparity was caused by the wage rates for skilled workers rising much faster rate than those of unskilled workers.

The objective of this study is to empirically examine the long run relationship between financial development, ICT and English proficiency on income inequality in Malaysia by employing the autoregressive distributive lag (ARDL) bound testing approach to cointegration. In addition, this paper tests the two influential hypotheses in the finance-inequality literature and digital divide literature. The *inequality-widening* hypothesis of financial development by Law and Tan (2009) states that financial development may benefit the rich and well-connected whereas the inequality-narrowing hypothesis posits the idea that when financial sectors grow the poor may gain more access to it. We also introduced two more variables in this analysis which are ICT and English proficiency to examine more broadly the consequences of the availability of ICT infrastructure and to relate with people's talents and skills since the development in finance might require other factors for the ability to reap the benefits of new technologies. By combining the ideas of rapid expansion of technology with human capital promotion of technological progress via innovation, this paper also tests the hypothesis of the digital divide because the latter is necessary but not sufficient to reduce inequality.

The past literature also documented financial development matters for the distribution of incomes and for poverty eleviation (Claessens and Perotti, 2007; Demirguc-Kunt and Livine, 2009). Based on these findings we anticipate that financial development does not only benefit individuals who are already rich but also allows for additional benefits in accessing ICT infrastructure and individual's skills. These facilities permit investors to exploit new investment opportunities from the improvement in financial access and new technologies in communications.

2. Literature Review

Past studies have established that financial development reduces income inequality (Clarke, et al., 2006; Bittencourt, 2006 & Liang, 2006). Clarke et al. (2006) examined the relationship between finance and income inequality for 83 developed and developing countries between 1960 and 1995, and discovered that in the long-run, inequality is reduced when financial development increased, as earlier by Galor and Zeira (1993). According to Beck et al. (2007), financial

development disproportionately raises the income of the poorest quintile and reduces income inequality. In contrast, other studies predicted that financial development may fail to reduce it. Claessens and Perotti (2007) argued that in countries with historically high levels of inequality, distortion in the institutional environment produces unequal access to finance, and ultimately leads to unequal opportunities, which in turn reinforces any initial economic inequality.

The literature shows that limited access to funding and financial services not only reflects economic constraints, but also form barriers erected by insiders. Banerjee and Newman (1993) had established that country with larger financial market imperfections such as information asymmetries and transaction costs that limit access to finance, are more exposed to income inequality. According to this view, finance alleviates poverty both by improving its access and by boosting economic growth. Law and Tan (2009) examine the role of bank and stock market developments on income inequality in Malaysia for the period 1980–2000. They found that developments in banks and stock markets are not significantly associated with income inequality.

Empirical studies on financial development as well as economic growth in Malaysia indicated that there is a long-term co-integration between these two variables (Amiruddin et al., 2007). Whereas Ang & Mckibbin (2007) who utilised data from 1960-2001 and the VECM method to analyse the relationship between financial development and financial liberalization towards economic development, discovered only one-way links which is output growth to long-term bank-based financial development. Tong et. all (2020) on the other hand found that Malaysia cannot rely solely on financial development in its search for long-run sustainable economic growth and stability. Instead, they proposed that the country needs to encourage inward FDI and new innovation through a variety of macroeconomics and microeconomic policy measures, to enhance long-run growth rates. These measures include investment and innovation incentivisation via tax reforms and expenditure on R&D to ensure continuous progress in innovation and the establishment of special economic zones.

Based on empirical studies Thagaveli and Ang (2004) focusing on Australia showed that the banking sector has a reactive effect on economic development and with a good stock market is generating growth. Similarly, studies conducted in Turkey indicated that the banking sector is more significantly related to growth than the stock market (Benerhan et al., 2011).

Studies on financial development relationships and income gaps should be continued for the country since economic differences will indirectly give a phase difference to financial development as well as economic prosperity. Hence, the emphasis on high-technology era as well as the enhancement of government policy in digital-based economies is necessary for re-evaluating the relationship of financial development and income inequality to ensure the well-being of society. The integration of systems and processes and ICT services by and with the people, including institutions and service providers, have resulted in the initiation of several

projects. Malaysia is hard at work encouraging manufacturers to adopt automation and smart manufacturing concepts and technologies.

Comparative studies between countries have shown thats financial development also reflects the allocation of monetary resources in elevating the quality of life through education and productivity. Thus, society has more options on occupational decision that can encourage an increase in income distribution, and reduce income inequality (Ridzuan et.al (2020)). Further, Koh et al. (2019) maintained that well-developed financial sectors will produce inequality-narrowing effect in the long-run through facilitating firms in accessing capital, which is an essential input to increase the company's productivity and performance.

3. Information and Communication Technology Development in Malaysia

With the progress of the Forth Industrial Revolution, information and communication technologies (ICT) emerged as a meta infrastructure: i.e., an infrastructure that reconfigures all others into smart systems that accelerate socioeconomic development. Technology can also be a driver of income and wealth inequality because of its skills-bias nature. Technology innovation has contributed to major breakthroughs in providing the poorest with access to basic services. Digital technologies have enlarged access to education and training, including to world leading universities, through massive open online courses (MOOCs). Online e-commerce platforms have enabled small producers to sell their products worldwide and develop new markets in rural areas. Technology offers considerable opportunities, but rewards are not guaranteed. For lower-income and other vulnerable groups to see benefits, research findings suggest that at least three conditions are necessary, namely the availability of ICT infrastructure, Skills to identify and use technologies and opportunities to access technologies that address the needs of low-income groups.

The rapid development of information and communication technology is generally necessary for a country, ICT development is comprehensive, encompassing mobile subscriptions, internet usage, mobile broadband services, fixed home ICT access and more. According to reports from the International Telecommunication Union 2016 (ITU), 2016 is the year of implementation towards the goal of sustainable development (SDG). Therefore, in order to achieve this mission, policymakers and the private sector need to fully utilize ICT potential to achieve SDG. The development of ICT in Malaysia has always gained good support from various parties, especially the government who believes that ICT is one of the strategic drivers to support and contribute directly to economic development. The 8th Malaysia Plan mentioned initiatives to build ICT infrastructure focused on increasing the use of computerization and IT in both government and private agencies.

In line with the development of ICT, daily life has also been facilitated through various digital applications such as E-commerce, advancements in the industrial, educational and health sectors. Among the motives for this ICT development initiative is to create a competitive knowledge-based economy (Jehangir et al., 2011) that may trigger indirectly highly competitive ability and opportunity on a global scale. In addition, technological developments in daily life, especially in education, industrial and commercial sectors adopted ICT use as one of the elements that are imperative to the needs of the community. As such, the government has allocated more spending on ICT infrastructure through fixed line telephone, internet access as well as paid public telephone facilities, especially in rural areas. In fact, in 1996 to fulfil the target of Vision 2020 towards achieving Malaysia's advanced status, the government has allocated the budget to develop the Multimedia Super Corridor (MSC) project as a platform to realise the use of ICT in the country.

It is therefore necessary to use modern ICT approaches to develop better understanding and acquisition of basic skills. Such tools and approaches are presently being used widely due to their convenience, omnipresence, effectiveness and economy. It was reported in the Malaysian Communications and Multimedia Commission's web *(www.mcmc.gov.my)* that the penetration of internet rose to about 77.3% with a population of 32, 454, 455. The Seventh Economic Plan (1996-2000) has motivated and focused the national attention on the necessary development of ICT infrastructure to ensure it is in place to enable the country to move rapidly into the information age. The government has also implemented computer ownership campaign of 'one home, one computer' in 2003, focused on buyers of new computers. On the other hand, for those who were not capable of owning computers the government provided a one stop centres equipped with computer and internet facilities. In the Ninth Malaysia Plan the existing one-stop centres will be upgraded to functional community centres to serve e-service, e-learning and information exchange.

4. English proficiency in Malaysia

English initially spread as a language of international trade and diplomacy under the British Empire, and subsequently during the post-war economic expansion of the United States. In many countries, English has replaced French as an indicator of the well-educated upper class. Globalization, urbanization, and the rise of the Internet uses have dramatically changed the role of English in the past 20 years. Today, English is one of the most important languages which have played role in the process of globalization and knowledge explosion and also as the most common means of communication throughout the globe. For this reason, English is often termed as link language, Global language as well as Global lingua franca. Alternatively, it is treated as a second language in ESL (English as a second language). At the individual level, English has the potential to generate opportunities, strengthen employability, and expand horizons.

Use of the English language has become vital for better learning and earning in the modern world. It is therefore necessary to develop English language skills among the people at every level. Use of computers, internet, television, radio, projectors and mobile phones, e-mail facility, online audio and video conferencing as well as new applications has made the Teaching Learning Process and Training attractive and convenient. Hence it is also playing an important role in the learning of language, especially English Language Learning. English is becoming a basic and essential skill for the entire global workforce, in the same way that literacy has transformed society in the last two centuries. English has transformed from a mere elite privilege into basic requirement for informed citizenship. Countries and companies that wish to attract foreign investments and trade, as well as stimulate entrepreneurial growth, have recognized the importance of English for creating a business-friendly environment. Malaysia, which ranks second in Asia and 14th globally for a conducive business environment, is praised for its recent commitment to English language instruction. In 2011, Malaysia implemented a national teacher training program to raise the proficiency of all English language teachers to an advanced level designated as C1 on the Common European Framework. (English Proficiency Index 2015: Mixed results across Asia)

It is evident that English is a key component for remaining competitive and fostering innovation in the marketplace. As English becomes increasingly necessary for interactions in the globalized world, so is the value of proficiency in the language, and conversely, the cost of not speaking the language likewise grows steeper.

5. Methodology

In order to test the effect of financial development, ICT and English proficiency on income inequality, the following specification of log-linear equation is used in the empirical model to examine the relationship:

$$lnGini_t = \alpha_0 + \beta_1 lnfd_t + \beta_2 lnict_t + \beta_3 lnincm_t + \beta_4 inf_t + \varepsilon_t \quad (1)$$

Where *lngini* is an indicator of income inequality, *lnfd* is financial development, *lnic*t is the proxy of information and communications technology, *lnincm* is income per capita and *inf* is inflation rate, ε_t is the error term and the subscript t represents time period.

In this study we also include one dummy variable to take account the effect of English proficiency on income disparity. The data in the study are from 1979 to 2016. The dummy variable is thus defined by:

$D1_t$= 1 during the 26 years of 1990-16 and zero elsewhere

Equation (1) is extended to incorporate dummy variable. The basic income inequality equation is as follows:

$$lnGini_t = \alpha_0 + \beta_0 D\,1 + \beta_1 lnfd_t + \beta_2 lnict_t + \beta_3 lnincm_t + \beta_4 inf_t + \varepsilon_t \quad (2)$$

Equation (2) provides a test of the inequality-widening hypothesis and the inequality-narrowing hypothesis of financial development. If b is positive and significant then financial development will widen income inequality. However, if b is negative and significant then the financial development will narrow the dispersion in income (Law and Tan, 2009). The second hypothesis is based on ICT which is a digital divide. If b is positive and significant then the diffusion of ICT will improve income disparity.

The model also includes additional control variables for inequality, namely income per capita and inflation. In theory, it stands to reason that income per capita may improve income distribution because the more capital is available the higher the income per capita as suggested in exogenous growth theories. Thus, inflation worsens income inequality because it reduces the general purchasing power for all but hurts the poor and middle-income groups more compared to the wealthy (Shahbaz & Islam 2011). The coefficients of β_3 and β_4 are expected to be negative and positive, respectively. Model (2) is estimated based on the entire sample using the bound test proposed by Pesaran et al. (2001).

6. Bound Test (Unrestricted Error Correction Model)

The autoregressive distributed (ARDL) bounds test was conducted as proposed by Pesaran et al. (2001) to examine the cointegration relationship between financial development, ICT, and English Proficiency on income inequality. This test was considered because it does not impose restrictive assumption that all variables must be integrated of the same order as with several approaches to cointegration. For example, the Engle-granger (1897) test and the maximum likelihood-based Johansen (1991, 1992) test and Johansen and Juselius (1990) test. Secondly, the bounds test is suitable for a small sample size. Given that this study was only limited to a total of 38 observations, conducting bounds test will be appropriate. The ARDL also applies irrespective of the order of integration and as such I (0) or I(1) is no more a sensitive issue and thus one can bypass the unit root tests. The following autoregressive distributed lag ARDL [p,q,r,s,t] model will be estimated in order to test the cointegration relationship between income gap and financial development, ICT and English proficiency as well as two control variables. The unrestricted error correction method (UECM) was used to examine the long-run and short-run relationship.

$$lnGini_t = C_1 + \sum_{i=1}^{P} \beta_{1i} \Delta\, lnGini_{t-i} + \sum_{i=0}^{q} \beta_{2i} \Delta\, lnfd_{t-i} + \sum_{i=0}^{r} \beta_{3i}\, \Delta lnict_{t-i} + \sum_{i=0}^{s} \beta_{4i}\ \Delta lnincm_{t-i} + \sum_{i=0}^{t} \beta_{5i} \Delta\, inf_{t-i} + \varphi_1 lnGini_{t-1} + \varphi_2 lnfd_{t-1} + \varphi_3 lnict_{t-1} + \varphi_4 lnincm_{t-1} + \varphi_5 inf_{t-1} + \varepsilon_t \quad (3)$$

Where, Δ is the first difference operator, ε_t is error term. Meanwhile p, q,r,s and t denote the autoregressive lag orders of the variable $\Delta lnGini$, $\Delta lnfd$, $\Delta lnict$,

$\Delta lnincm$ and Δinf, repectively. The above equation is estimated consistently by the ordinary least square (OLS) technique. Next, the presence of cointegration can be traced by restricting all estimated coefficients of lagged level variables to equal zero. That is the null hypothesis is

$$H_0: \varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = \varphi_5 = 0$$
$$H_1: \varphi_1 \neq \varphi_2 \neq \varphi_3 \neq \varphi_4 \neq \varphi_5 \neq 0$$

In ARDL bound testing, if the calculated F-statistic exceeds the upper critical bound then we reject the null hypothesis and conclude that the series are cointegrated. If it is below the lower critical bound, we do not reject the null hypothesis of no cointegration. If the calculated F-statistic is between upper critical bound and lower critical bound, then the decision about cointegration is inconclusive. The ARDL bounds testing approach to cointegration uses $(p + 1)^k$ formula to estimate the number of regressions. The p indicates the maximum number of lags utilized and k the total number of variables (Shahbaz & Islam 2011). The critical bounds of this study are taken from Pesaran and Pesaran (1997) and Narayan (2004a; 20004b; 2005). As an additional contribution to the literature critical values based on Narayan are more suitable for small sample sizes ranging from 30 – 80 observations (Narayan 2005).

The diagnostic tests check for auto correlation which is LM Breush-Godfrey and ARCH, are applied in this study. The stability test of long-run and short-run parameters is checked by using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares (CUSUMQ) of recursive residuals.

7. Data

This study uses annual data in the context of Malaysia covering the period 1979-2019. In 1979 the changes in education were largely introduced and the use of English was limited since the government aspired to strengthen the Malay language as a mother tongue of the nation. The data were sourced from Global Financial Development Database (GFDD), Standardize World Income Inequality Database (SWIID), Department of Statistic Malaysia (DOSM) and World Bank Development Indicator (WDI). Financial development was measured by the credit given to the private sector. The proxy for financial development used credits to the private sector. According to Law and Tan 2009 credit to the private sector was a relevant proxy used in their study as it measures opportunities for new investors. According to Beck et al (2000) and Livine et al 2000, if the amount of credit to the private sector is high then it is indicative of rapid growth for the country.

Beside using the above financial development indicator, this study also employs two other variables in the analysis of ICT which was measured by penetration rates for fixed telephone line services (for every 100 people). This proxy was used as a fixed line rate between long-used communications tools in the country. The externalities of the network from this communication infrastructure

can indirectly benefit the consumers since their large number indicates value and benefits enjoyed by the users (Azmi & Said, 2007). Further, the development of telecommunications infrastructure can connect rural and urban areas, increasing the contribution to economic growth thus enhancing the standard of living of the community especially in rural areas. Generally, the rapid development of telecommunications infrastructure can reduce transaction costs, improve market information and improve the efficiency of the services sector, thereby improving the standard of living for the community.

The Gini coefficient is obtained from the Malaysian Statistics Department to gauge income inequality and the measurement of this index can be used to determine the distribution of income. In addition, the Gini coefficient is based on measurements of 0 and 1 with '0' as the fair distribution of income while '1' is the converse. The Gini coefficient is measured based on the distribution of household monthly gross income. Annual data on income per capita is based on 2010 constant price and inflation rate is percentage of consumer index.

This study also includes dummy variable to determine the proficiency of English language based on the basis of government policy to strengthen English usage over two study period. For the first period 1979-1989, it was assumed that the convergence of English proficiency level was not a vital issue since the Malay language was declared the medium of communication in all schools. Subsequently, in the second period of study 1990-2019 it was assumed that English proficiency had been re-attested since it was recognized that the level of English proficiency was very important especially in the era of globalization when nearly 99% of global information used the English-language in all aspects including changes of career structure, education, skills training and lifestyle pattern (Maharam, 2016). The language penetration depends on the programs conducted by the ministry of education that promotes the English language as a second language with wide usage in speaking and international communication.

8. Result and Discussion

Before conducting the bounds test, the time series properties of the variables were examined using unit root tests. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were employed to determine the order of integration of the variables. Based on ADF results indicate that all the series, except for lnFd and lnICT were stationary after first differencing, i.e they were at I (1) variables. PP test statistics showed that all the variables, except for lnICT, were stationary at I (1) with and without trend, and mostly at 1% significance level. The test for unit root was to assure that none of the series is integrated at I(2) or higher. Although the ARDL approach does not require pre testing for non-stationary of the series, an order of integration of I (2) or higher can make the results unreliable (Shahbaz & Islam, 2011). This feature makes ARDL bound testing approach the method of choice for examining cointegration.

Table 1. Unit Root Test Dickey Fuller (ADF)

Test	ADF (level)		ADF(1st Diff)	
Variable	Intercept	Intercept with trend	Intercept	Intercept with trend
lnGini	-0.6305 (0.851)	-1.744 (0.711)	-6.418 (0.000)***	-6.8780 (0.000)***
lnFd	-2.278 (0.184)	-2.383 (0.381)	-2.48 (0.128)	-2.449 (0.349)
lnICT	-1.789 (0.379)	-1.707 (0.727)	-1.708 (0.418)	-1.990 (0.586)
lnIncm	0.087 (0.942)	-7.070 (0.000)***	-3.547 (0.014)**	-4.453 (0.006)***
Inflation	-3.329 (0.020)**	-3.675 (0.036)**	-6.623 (0.000)***	-6.803 (0.0002)***

Note: The t-statistic values while () are the probability values, (*) significant at the significance level of 10%, (**) at significance level of 5%, (***) at significance level of 1%. * is the probability value of MacKinnon (1996) P one end point value.

Table 2. Unit Root Test Phillip Perrons (PP)

Test	PP (level)		PP (1st diff)	
Variable	Intercept	Intercept with trend	Intercept	Intercept with trend
lnGini	-0.630 (0.857)	-1.753 (0.706)	-6.418 (0.000) ***	-6.345 (0.000) ***
lnFd	-3.262 (0.027) **	-2.618 (0.2747)	-5.312 (0.000) ***	-5.490 (0.004) ***
lnICT	-4.376 (0.0013) ***	-1.535 (0.798)	-1.700 (0.423)	-2.088 (0.534)
lnIcm	0.2771 (0.934)	-2.451 (0.349)	-4.606 (0.007) ***	-4.672 (0.003) ***
Inflasi	-3.296 (0.022) **	-3.727 (0.032) **	-8.458 (0.000) ***	-8.423 (0.000) ***

Note: The t-statistic values while () are the probability values, (*) significant at the significance level of 10%, (**) at significance level of 5%, (***) at significance level of 1%. * Is the probability value of MacKinnon (1996) P one end point value.

The results of the ARDL bounds test are shown in the table 4.2 and table 4.3. According to the computed F-statistic, we have enough evidence to reject the null hypothesis of no cointegration and proved that there was a long-term relationship between income inequality, financial development, ICT, income per capita as well as inflation and English proficiency. In addition, the computed F-statistics were also based on the critical values in the Narayan (2004) table as the total observation in this study was only 38. That is, the computed F-statistic for these models is 5.61 which is above the upper bound critical value of 5.06. This proves that there exists a steady state long run relationship amongst income inequality, financial development, ICT, income per capita, inflation and dummy of English proficiency. Once the existence of a long-term cointegration relationship is confirmed, the conditional ARDL for the long-term model can be estimated. There is a tendency for variables to move towards a long-term balance. Tables 4.18 and 4.19 show estimates of long-term

coefficients by using ARDL model and results of error correction model (ECM). This study selects the ARDL model (2, 3, 1, 0, 2) to illustrate that the interval required by each variable affects the income imbalance. Short-term versions of the lat-lat model ARDL are selected based on AIC since it is more suitable for smaller sample than SBC. Additionally, the adjustment value for the ARDL model indicates that 63 percent of the variables are explained by the independent variables.

The long-run elasticities of income inequality with respect to financial development, ICT, income, inflation and English proficiency dummy are reported in Table 4.19. The empirical results indicate that the financial development indicator is a significant determinant of income inequality irrespective of banking sector. The ICT indicator and inflation however are negatively correlated with income inequality and statistically significant, while income and dummy English proficiency are negatively significant determinant of income inequality as well. It appears that English proficiency based on the programme implemented by the government beginning 1990, to strengthen the English language usage, has a significantly positive impact on income distribution.

Table 3. Bound Test for Cointegration Test

Null Hypothesis: No Cointegration					
Computed *F*-statistic	Significance level	Critical Value (Pesaran)		Critical Value (Narayan)	
		Below	Above	Below	Above
5.610	1%	3.74	5.06	4.59	6.36
	5%	2.86	4.01	3.27	4.63
	10%	2.45	3.52	2.69	3.89

Note: The sum of K (independent variables) is 4.

Table 4. Unrestricted Error Correction Model of the Income Inequality Equation (Dependent Variable: LnGini, estimated period :1976-2019)

Variables	**Coefficient**	**Std. Error**	***t*-Statistic**
ECT (-1)	-0.515	0.121	-4.224***
ΔlnFd	-0.013	0.040	-0.337
ΔlnFd(-1)	-0.067	0.043	-1.551
ΔlnFd (-2)	0.072	0.044	1.619
ΔlnFd (-3)	0.049	0.037	1.315
ΔlnICT	-0.159	0.124	-1.287
ΔlnICT (-1)	0.317	0.124	2.552**
ΔlnIncm	-0.107	0.023	-4.657***
ΔInflation	0.004	0.002	1.858*
ΔInflation (-1)	0.0006	0.002	0.271
ΔInflation (-2)	0.004	0.002	2.005**
D2	-0.039	0.024	-1.622
C	3.421	0.739	4.629***
R-squared	0.638	F-statistic	3.261
Adjusted R-squared	0.442	Prob f-statitic	0.005
AIC	-4.804	Dubin-watson stat	1.848

Note: Estimation is based on conditional ECM using ARDL (2,3,1,0,2) the number ( ) is lat and *.**,*** indicates significant at the 10%,5% and 1%.

Table 4. Long-run Elasticities of Income Inequality in Malaysia (DV: LnGini estimated period: 1979-2019)

Variables	Coefficient	Std. Error	*t*-statistic
constant	6.642	0.524	12.66***
lnFd	-0.394	0.099	-3.98***
lnICT	0.306	0.083	3.65***
lnIncm	-0.208	0.042	-4.94***
Inflation	0.018	0.006	2.65**
D2	-0.077	0.044	-1.739*

Note: *, **, *** indicates a significant level of 10%,5% and 1%.

The robustness of this model has been confirmed by several diagnostic tests, such as Breusch-Godfrey serial correlation LM test, Jacque-Bera normality test and Ramsey RESET specification test. All the tests revealed that the model has desired econometric properties, namely the residuals are serially uncorrected, normally distributed and has a correct functional form. Accordingly, this study assesses the stability of the long run relationship between money demand and its determinants. We relied on the CUSUM and CUSUM-sq tests proposed by Brown et al (1975) to test for constancy of long-run parameters. We applied the tests to the residuals of the model. The CUSUM test is based on the cumulative sum of recursive residuals from the first set of n observations. It is updated recursively and is plotted against the break points. If the plot of the CUSUM statistics stays within the 5% significance level, then the estimates are stable. The same applies to the CUSUM-SQ statistics, which are based on the squared recursive residuals. As can be seen in Figures 1and 2, the plot of the CUSUM and CUSUMQ statistics stay within the critical bounds (represented by a pair of straight lines) indicating the stability in the variables. Its exclusion may lead to the function to exhibit some instability.

Table 5. Diagnostic Test

Diagnostic Checking	Estimated results
Autocorrelation *(Breusch-Godfrey LM Test)*	0.8354 (0.4470)
Heteroskedastisiti *(ARCH Test)*	0.1804 (0.6733)
Stability *(CUSUM Test)*	Stable at 95% significance level
Stability *(CUSUM of Square Test)*	Stable at 95% significance level

Note: ( ) is a probability value

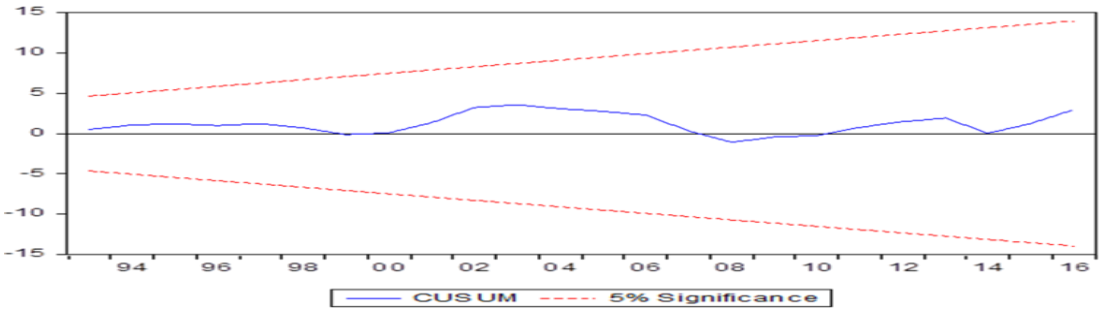

Figure 1. CUSUM Test Results (straight lines represent critical limits at 5% significance levels)

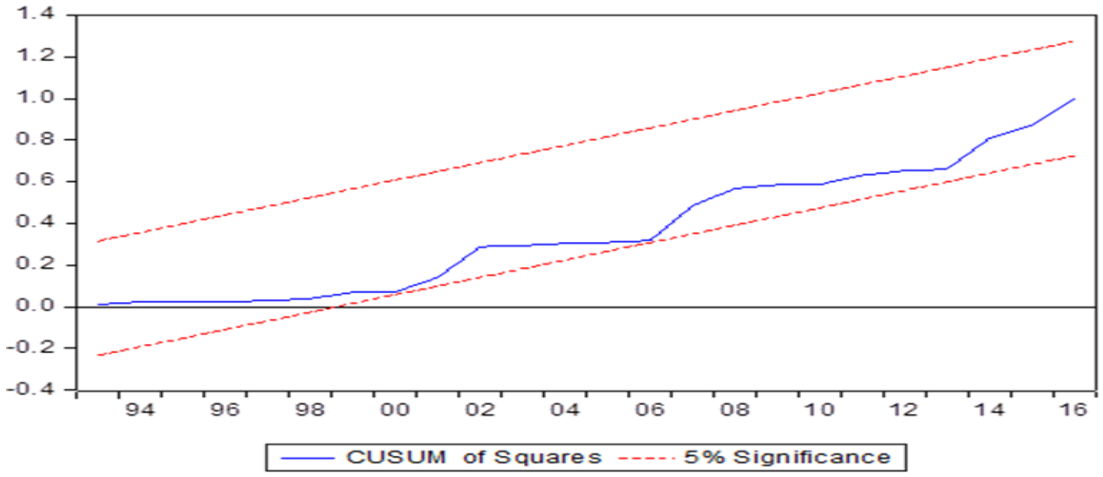

Figure 2. CUSUMQ Test Results (straight lines represent critical limits at 5% significance level)

9. Conclusion

This study examined the effect of financial development, ICT and English proficiency on income inequality in Malaysia in the period 1979-2019. In Financial development it has been argued in the literature that financial systems have a potentially important role to play in equalizing economic opportunities and reducing inequalities. Therefore, it is important to consider the link between financial development, ICT, English proficiency and income inequality. In addition, the development of ICT as well as the mastery of English can indirectly contribute to a shared economy that is an asset-based social ecosystem that uses digital platforms to create economic value through increased resource use between individuals, businesses and governments. In the transformation from various angles that can increase contribution to socioeconomic growth to improve income distribution, there is a need to place more emphasis on education and human capital. This will increase earning in the lower income segment of the population and make the distribution of income more equitable.

Empirically, basic estimates of this study and sensitivity analysis show that financial development is negative and significant with inequality in the long-term. However, the impact of financial development is positive for the short-term. Thus, the relationship of financial development and income inequality in Malaysia is seen to support the long-term inequality-narrowing hypothesis. Conversely, ICT shows the opposite result. In addition, the finding show that English proficiency is seen to have a significant impact and has a negative sign on income inequality. This suggests that the initiative to improve English proficiency is relevant in reducing the income gap for the long-term especially in English proficiency which is regarded as a crucial quality when looking through job applications. To attain a sustainable economic goal, this component is essential for improving access to capital, facilitating the development of entrepreneurial skill, and enabling students to

pursue higher education and receive quality instruction, particularly in the fields of science and technology, which primarily use English as a second language.

The issue on English proficiency has its origin in the policies implemented since Malaysia was formerly an English colony before independence in 1957. As such, some British cultural influences have obviously remained such as use of the language in the education process. The English proficiency in Malaysia is at a high level based on the index of English proficiency with a score of 562 (Report EF EPI, 2021). In addition, the role of English proficiency is important and parallels that of ICT advancement. Since 1990, Malaysia has created greater awareness in the influence and function of English as more than 95 per cent of the internet sites use English as the medium of instruction (Hanapiah M. F, 2004). English proficiency is also an important input in human resource development such as efficiency in management and communication skills which indirectly contributes to the dissemination of knowledge and technical skills. As a result, English language proficiency is also able to reduce the gap between the rich and the poor based on the level of education that provides greater opportunities for participation in business and economy. This is supported by Ismail (2012) who states that employers expect graduates in the job market to have soft skills such as communication skills, English proficiency, general and current knowledge.

The need to examine the roles and position of English proficiency development in Malaysia and in the world is due to the spread and influence of English that has extended throughout the country. The English language has indeed been declared as the second most important language in Malaysia and is widely used in various fields by Malaysians especially in the era of technology and communications. Therefore, the proficiency of English is indirectly influential in certain areas of development such as business, employment, education, politics, tourism, law, media and translation.

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