Does Financial Development and Corruption reduce the level of Income Inequality? Evidence from Malaysia

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Abstract: Income inequality is an enduring issue and an important one to address, especially in the new era of digital transformation, as it is a crucial element in promoting persistent income inequality. The theory is that while financial development promotes economic growth, the mixed explanations of previous studies show that this does not always help low-income people in emerging economies. Moreover, the effects of globalization may reinforce motives and increase opportunities for international corrupt practices. It is, therefore, crucial to explore how corruption can be motivated by ineffective rules governing cross-border crimes and how technology can open up new avenues for corrupt behavior, for example by making it easier to find victims, accomplices and money. Profound socio-economic changes can also provide incentives and opportunities for corruption. This study examines how corruption and financial development affect the wealth gap in a developing country like Malaysia over the period 1995 to 2021. The empirical results show that financial development has a positive impact on income inequality. Moreover, the result also shows that corruption control is an insignificant determinant of per capita income in Malaysia. Even though the growth of the financial sector has led to a variety of outcomes, it has only helped to reduce income inequality. Income inequality is negatively and significantly affected by the interaction between financial development and anti-corruption. It is therefore important to promote financial development, prevent corruption and increase government transparency as these factors can promote sustainable economic development and resilience.

Keywords: *Financial development, Corruption, Income Inequality, Malaysia.*

1. Introduction and Background

Malaysia's economy has recently made great strides in reducing poverty, but income distribution has yet to stabilize. Malaysia has always been concerned with issues of income inequality. First, there is the problem of ethnic inequality, which existed long before Malaysia became independent. Secondly, after the violent ethnic riots in May 1969, economic policies were changed to focus on growth and a more equal distribution of wealth among ethnic groups, especially the Malays. Economic inequality in Malaysia peaked in 1976 before declining until 1990. According to Shari (2000) and Law & Tan (2009), the general development policy of the New Economic Policy (NEP) influenced the economy from 1971 to 1990. The general development policy implemented under the New Economic Policy (NEP) 1971-1990 had a major impact on reducing income inequality in Malaysia. However, since 1990, a trend of increasing income inequality has been observed.

Shari (2000) stated that the reversal of government policies towards liberalization, deregulation and privatization since the late 1980s has contributed to this trend of increasing inequality. Ragayah et al. (2000) also examined the hypothesis that rising income inequality in the 1990s was the result of the shift in industrialization from labor-intensive to capital- and technology-intensive. During the period 1991-2000, the economy was driven by the National Development Policy (NDP), which aimed to maximize economic growth through policies that allowed the free play of market mechanisms and the active participation of the private sector (Economic Planning Unit). The main objective of the NDP was to sustain economic progress to achieve the status of a fully developed nation by 2020, as envisaged in the Vision 2020 long-term plan. These policy reforms were accompanied by the role of the private sector in the market to improve investment efficiency and productivity. It is argued that the imbalance in income inequality was caused by wage rates.

The wages of skilled workers are rising much faster than those of unskilled workers. Based on the new economic and political study, the theme for Budget 2023 is "Membangun Malaysia Madani" (Developing a

Civil Malaysia). Recently, the term "Malaysia Madani" has been declared the concept of the nation and the vision of the unity government to promote progress towards the heights of civilization. The country's course has gone off track in the past in the implementation of many projects and efforts are being made to correct this. This slogan is also the government's response to problems such as pervasive corruption, government censorship, financial mismanagement and social division. These problems are deeply rooted in Malaysian society and need to be addressed as soon as possible to stop the weeds of economic, political and social stagnation from spreading. More than 60% of the 156 investigations launched by the Malaysian Anti-Corruption Commission's (MACC) Special Operations Branch (BOK) into public interest cases between 2020 and 8 June this year involved politicians. The objective of this study is to empirically examine the relationship between financial development and corruption on income inequality in Malaysia using the OLS approach with robust clusters and the interaction term.

In addition, this paper tests two hypotheses from the literature on financial inequality and the relationship between corruption and income inequality. Law and Tan's (2009) hypothesis on widening inequality in finance state that financial development benefits the rich and well-connected; while the hypothesis on reducing inequality states that the poor gain more access to the financial sector as it grows. We have also introduced interaction variables in this analysis, namely financial development and corruption controls, to more comprehensively examine the consequences of the availability of corruption controls in a country. By combining the ideas of rapid expansion of financial development and corruption control, this paper also tests the "too much finance" hypothesis, which focuses on a non-linear relationship, as the latter is necessary but not sufficient to reduce inequality. Previous literature has also shown that financial development is important for income distribution and poverty reduction (Claessens and Perotti, 2007; Demirguc-Kunt and Livine, 2009). Based on this evidence, we assume that financial development not only benefits people who are already rich but also facilitates additional access benefits. These facilitators enable investors to take advantage of new investment opportunities arising from improved access to financial services and new communication technologies.

At the same time, the control of corrupt institutions and transparency are crucial for an equitable distribution of income in the country. Therefore, it is important to further analyze the relationship between financial development and income inequality in the different dimensions of emerging economies. Studies on the relationship between financial development and income inequality should be continued with respect to a country, as economic differences indirectly lead to a phase difference in financial development and economic prosperity. Therefore, it is important to focus on the high technology era and improve government measures to control the corrupt economy to re-evaluate the relationship between financial development and income inequality and ensure the well-being of society. The study of the relationship between financial development and income inequality has been the subject of extensive theoretical and empirical research, as understanding the relationship between income inequalities is a concern in every society. Developments in globalization can increase the motivation for transnational corrupt schemes and multiply the opportunities. It is important to explore how the lack of effective controls on transnational crimes can foster corruption and how technology provides new opportunities for corrupt practices, for example, by allowing easier access to money, accomplices and victims. Profound socio-economic developments can also provide incentives and opportunities for corruption.

2. Literature Review

According to Levine (2005), financial development refers to improvements in the nature, number and effectiveness of financial intermediaries. As a result, low-productivity firms can obtain external finance to enter the market (Rajan and Zingales 2003a; von Ehrlich and Seidel 2015). This is because greater financial depth helps to lower agency costs. One of the economists, Simon Kuznets, noted that the degree of economic inequality is mainly a product of different levels of development. Traditionally, the relationship between development and income inequality was first analyzed by Kuznets, who found that high development spending increases income inequality in the short run, but in the long run, development spending reduces income inequality (Kuznets, 1955). Kuznets claims that the distribution of wealth in underdeveloped countries is comparatively equitable. As a country's economy develops, more capital is accumulated, increasing the wealth and income of owners and leading to inequality. Eventually, more developed countries

return to lower levels of inequality through various potential redistributive mechanisms, including social programs. The relationship between financial development and income inequality has been widely researched since the important contributions of Banerjee and Newman (1993), Galor and Zeira (1993) and Greenwood and Jovanovic (1990), with contradictory results.

One group of studies shows that the relationship between financial development and income inequality is not linear, supporting Greenwood and Jovanovic's (1990) suggestion that there is a hump-shaped or inverted U-shaped relationship between the two variables. According to this, income inequality initially increases with the development of the financial sector, but later decreases as more people gain access to this sector. Numerous theories on financial sector development and inequality have been put forward in this field, some of which were partly inspired by the studies described above. According to Shahbaz et al. (2017) and Ridzuan (2021), "the inequality widening hypothesis, the inequality narrowing hypothesis, and the inverted U-shape of inequality hypothesis" are the three most frequently cited theories on financial development and income inequality. In a related study, Kim and Lin (2011) pointed out that the benefits of financial development for income distribution only materialize once a country has reached a certain level of financial development. Below this crucial level, financial development harms the poor and worsens income inequality. This assumption is also contradicted by Tan and Law (2012), who examine the non-linear relationship between financial development and income inequality and speak of a U-shape rather than an inverted U-shape. This theory states that financial development up to a certain point benefits both the wealthy and the poor, but from that point on, any further growth would have a negative impact on the distribution of money.

If the threshold is exceeded, this shows the ineffectiveness of financial markets in reducing economic inequality. In addition, many scholars have recently become interested in studying the relationship between perceptions of corruption and financial markets and their impact on the financial system. Understanding how corruption affects financial markets is crucial, especially for developing countries. Corruption is defined differently by different people. The shortest definition of corruption is the abuse of public authority for personal gain (Park and Khanoi, 2017). According to another definition, corruption is the dishonest or illegal behavior of public authorities (Shumetie and Watabaji, 2019). The World Bank describes corruption as" "the use of public power for private interests" (World Bank, 2000). The impact of corruption is also reflected in the recent push by international policymakers and the international community for political and economic reforms, particularly in the financial sector, to address persistently low growth and high inequality in developing countries. The Corruption Perceptions Index 2022 (CPI) shows that most countries have failed in the fight against corruption. The Corruption Perceptions Index CPI ranks 180 countries and territories around the world on the perceived level of corruption in the public sector on a scale of 0 to 100, where 0 means that countries are very corrupt, while 100 means that there is no corruption activity in the countries at all.

Currently, Malaysia ranks in the middle with a score of 61, according to Transparency International. According to a study by Carolyn and Mduduzi (2022), financial development reduces inequality between developing and least developed countries but has no statistically significant impact on advanced countries. Meanwhile, emerging countries have much higher corruption rates compared to established countries Mirzayev (2023).

3. Research Methodology

This study focuses on time series data from 1995-2021, with most data coming from the World Bank. For the level of corruption, this study uses a proxy from the International Country Risk Guide (ICRG) corruption control variable, and for robustness, the William's Transparency Index (Index) is used as a measure of corruption control, while the macro data is from the World Bank database (World Bank). To measure financial development, this study used a proxy already used in the studies by Rousseau & Watchel (2011) and King & Livine (1993), where credit to the private sector was used as a proxy for financial development. Credit to the private sector is private credit that symbolizes the level of financial intermediaries and is the best measure of financial development (Hafer, 2016). This study also uses variables based on the study of Rousseau & Watchel (2011) and King & Livine (1993), i.e. variables such as inflation, trade openness and unemployment. All variables were transformed into natural logarithms, except for the corruption control

variable (ICRG). To test the relationship between financial development and corruption control on income inequality, the following log-linear equation specification is used:

$$lnGini_t = \alpha_0 + \beta_1\,lfd_t + \beta_2\,icrg_t + \beta_3\,lninf_t + \beta_4\,unem_t + \beta_5\,lop_t + \varepsilon_t$$

This study also includes an interaction variable *(lfd*icrg)* to account for the impact of financial development and anti-corruption on income inequality. The interaction term between the variables means that the complementary role of anti-corruption in the relationship between financial development and inequality is captured based on this model:

$$lnGini_t = \alpha_0 + \beta_1\,lfd_t + \beta_2\,icrg_t + \beta_3\,lfd*icrg_t + \beta_4\,linf_t + \beta_5\,lninf_t + \beta_6\,lop_t + \varepsilon_t$$

To include the interaction term between variables, this study uses the Demean method introduced by Balli and Sorensen (2012), which takes the mean of X and then the minus value for each observation. This method is more reliable for interaction terms as it can reduce the collinearity problem between variables. The model implies the interaction term based on the Demean method as follows:

$$lnGini_t = \alpha_0 + \beta_1\,lfd_t + \beta_2\,icrg_t + \beta_3(lfd - \overline{lfd})(icrg - \overline{icrg}) + \beta_4\,linf_t + \beta_5\,unem_t + \beta_6\,lop_t + \varepsilon_t$$

This study also uses the non-linear relationship. The literature states that the use of a linear methodological framework is not able to capture the exact form of the relationship under study. According to the theory of Kuznets (1955), income inequality in a growing economy may initially increase due to structural change and then decrease over time to a certain threshold.

The inverted U hypothesis finds application in understanding the relationship between economic freedom and income inequality. Due to market allocation, which favors high-income groups in the early stages of economic independence, income inequality may increase; however, as incomes rise and overall living standards increase, income inequality may decrease. In addition, the economies in the sample under study operate with different economic institutions and policies, are at different stages of development and consequently have different patterns of income inequality. According to this concept, the upper part of the income inequality is initially assumed to benefit from the growth process, but after reaching a certain growth point, these benefits may also reach the lower part of the same distribution (Bennett and Vedder, 2013). Hopkins and Blythe (2012) have found evidence of a non-linear effect of regulatory freedom on inequality. The non-linear equation is as follows:

$$lnGini_t = \alpha_0 + \beta_1\,lfd_t + \beta_2\,lfd2_t + \beta_3\,icrg_t + \beta_4(lfd - \overline{lfd})(icrg - \overline{icrg}) + \beta_5\,linf_t + \beta_6\,unem_t + \beta_7\,lop_t + \varepsilon_t$$

The relationship between financial development and income inequality is analyzed in this study in a two-stage procedure based on a nonlinear model without interaction variable and a nonlinear model with interaction variable based on estimation using OLS with robust clusters to overcome heteroskedasticity and autocorrelation problems.

4. Results

This section provides some descriptive statistics and an overview of the correlation of income inequality in Malaysia over the period 1995 to 2021. In addition to the descriptive analysis, a correlation matrix, a summary of the model regression and a robust test describing the relationship between financial development, corruption and income inequality in Malaysia are identified. Indices based on Gini and corruption control are calculated and used to explain the changes in income inequality in the country.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
lgini	27	3.7672	0.10306	3.6331	4.0963
lfd	27	4.7906	0.11527	4.5706	5.0427
lfd²	27	3.3323	2.88325	-3.3501	7.0366
lfdicrg	27	1.2915	1.55731	-2.6638	2.3672
Icrg	27	4.9633	0.26636	4.3000	5.3200
Unem	27	3.3072	0.41998	2.4000	4.5400
Inf	27	2.3064	1.41780	-1.1387	5.4407
lop	27	5.1151	0.20513	4.7607	5.3955

Note: dependent variable lgini (Gini index) independent variable: lfd (financial development), lfd²(quadratic term of financial development), lfdicrg (interaction term between financial development and corruption), icrg(control of corruption indexes), unem (unemployment rate), Inf (inflation rate by consumer index), lop(open trade indicator).

Table 1 shows the descriptive analysis in this study. From the table, it can be seen that the variable trade openness (lop) has the highest mean value of 5.1151 and the standard deviation for lop is 0.20513 which is less than the mean value indicating that trade openness did not fluctuate during the study period. The interaction variable between financial development and corruption control (lfdicrg) has a lowest mean of 1.2915 and a highest of 2.3672, indicating that the average number of years is 27.

In addition, the interaction variable (lfdicrg) has the highest standard deviation value, indicating that the data is scattered and dispersed. This indicates that the scale of the data fluctuated throughout the study period. Most variables have a maximum value of more than 2, indicating that the distribution of the data is too strong. As far as corruption control (icrg) is concerned, it shows that the mean value is 4.9633 while the maximum and minimum values are 5.3200 and 4.3000 respectively. This shows that the average of corruption control influences for the period under consideration.

Table 2: Correlation Matrix

Variables	LGINI	LFD	LFD²	LFDICRG	ICRG	UNEM	INF	lop
lgini	1							
lfd	0.311	1						
lfd²	-0.122	0.029	1					
lfdicrg	0.135	0.093	0.761	1				
icrg	0.239	0.343	0.816	-0.149	1			
unem	0.260	-0.171	-0.04	-0.019	-0.171	1		
inf	-0.487	-0.032	0.334	0.324	0.189	-0.465	1	
lop	-0.274	0.038	0.438	0.348	0.226	-0.251	0.090	1

Table 2 shows that all independent variables (lfd, lfdicrg, icrg, unem, inf and lop) have a positive and negative correlation with the dependent variable (lgini) and with each other. The correlation between the variable financial development (lfd) and corruption control (icrg) as well as the correlation between inflation (inf) and income inequality (lgini) (where the p-value was significant, i.e. at 10%), all variables have a significant correlation with each other at a 1% significance level.

Table 3: Summary of Regression Model without Interaction

Variable	Coefficient	Std. Error	t-Statistic	Probability
lfd	-.174800	.12580	1.55	0.137
lfd²	.005857	.00705	0.83	0.416
icrg	.143905*	.00529	2.11	0.073
Unem	.02540	.04852	0.52	0.606
Inf	-.03121**	.01520	-2.05	0.053
lop	-.09234	.10695	-0.86	0.389
Constant	2.7088***	.82469	3.28	0.004
R-Squared				0.427

F-statistic	1.83	0.151
Diagnostic test		
Skewness & kurtosis Test	37.642***	0.000
Normality (Jarqua-Bera)	14.5628***	0.0006

Note: (*) significant at the significance level of 10%, (**) at significance level of 5%, (***) at significance level of 1%. * is the probability value of MacKinnon's (1996) P one endpoint value.

Table 4: Summary of Regression Model with Interaction Variable

Variable	Coefficient	Std. Error	t-Statistic	Probability
lfd	-.059307	.151574	0.94	0.378
lfd²	.022396**	.009057	2.47	0.048
lfdicrg	-.02843**	.011814	2.41	0.047
icrg	.14700	.08066	1.82	0.111
Unem	.05948*	.02961	2.01	0.085
Inf	-.03093**	.01357	-2.28	0.057
lop	-.12951	.10700	-1.21	0.265
Constant	2.8980***	.67523	4.29	0.004
R-Squared				0.8331
F-statistic			8.42**	0.0095
Diagnostic test				
Skewness & Kurtosis Test			2.6789	1.000
Normality (Jarqua-Bera)			14.5628***	0.0006

Note: (*) 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 endpoint value.

Table 3 and Table 4 show the regression results for the model without an interaction term and the model with an interaction term. Both models include a quadratic variable estimated based on a non-linear model. As mentioned earlier, the model without an interaction term shows that the two coefficients for financial development lfd and lfd2 have a non-linear relationship with income inequality, as the results show that both variables have a negative sign. This is consistent with previous studies that showed an inverted U-shape, confirming the validity of the financial Kuznets hypothesis. Previous studies by Ridzuan et al. (2021, 2019) and Law and Tan (2009) also support the improvement of income distribution through deepening financial development.

The coefficient icrg is significant at the 10% level, but the positive sign suggests that controlling corruption in the region has not been an effective means of providing credit to the private sector. According to Adam and Klobodu (2016), there is a negative relationship between corruption levels and per capita income, which is consistent with efficiency-reducing views.

Thus, if there is a positive relationship between the level of corruption and per capita income, which illustrates the case of the efficiency-enhancing view, it has a negative impact on inequality as financial development increases and becomes larger. Furthermore, a positive corruption coefficient indicates that the higher the level of corruption, the higher the per capita income; there is a negative relationship between the level of corruption and income, which is consistent with the efficiency-reducing view (Hasaballa, 2017). For the control variables, the result shows that only inflation is significant and has a negative sign. Consequently, the inflation rate and per capita income are expected to be negatively correlated. Positive correlations between the inflation rate and economic growth are the exception. The fact cited by Andres and Hernando (1997) that inflation reduces investment and efficiency is only one of several reasonable explanations for this fact.

The results from Table 4 show the interaction term. The variable of financial development captured by both lfd and lfd2 has an inverted U-shape, confirming the existence of the financial Kuznets hypothesis. The improvement in income distribution by deepening financial development is also confirmed by an earlier study by Law and Tan (2009). It provides a test for the hypothesis of increasing inequality and the hypothesis of reducing inequality through financial development. If lfd is positive and significant, financial development

will increase income inequality. However, if lfd is negative and significant, then financial development will reduce income dispersion. This study is consistent with the hypothesis that inequality is increasing as evidenced by lfd2 which has a positive sign and is significant at the 95% level. As evidence, Malaysia is positioning itself as an international provider and centre for Islamic fund and wealth management to strengthen its current position as a global hub for Islamic finance (Securities Commission Malaysia, 2017). The control variable in Table 4 shows that unemployment and inflation are significant but have different signs.

The negative sign and significance of the coefficient for the interaction term in Table 4 therefore indicate that income inequality in the region has decreased as a result of Malaysia's financial development and anti-corruption initiatives. The negative coefficient of the interaction term indicates that financial development combined with effective anti-corruption initiatives reduces income inequality. This is consistent with the research findings of Rajan and Ramcharan (2011) and Law, Tan and Azman-Saini (2014), which highlight the importance of institutional quality in determining the impact of financial development on income distribution. Moreover, these findings suggest that in the presence of a strong institutional framework, financial development contributes to a reduction in income inequality in the long run.

Table 5: Robustness Test

Variable	Coefficient	VIF
Lfd	.14249	3.40
Lfdicrg	-.02843	1.62
Icrg	.14700	3.40
unem	.05948	1.90
Inf	-.03093	2.29
Lop	-.12951	1.90

The constant-centered variance inflation factor (VIF) for the model regression was used to test for multicollinearity, as shown in Table 5 below. If the value of the VIF is greater than or equal to 10, the model is considered multicollinear. From the table above, none of the variables has a mean VIF value greater than 10, which means that the model is not highly multicollinear.

5. Managerial Implications and Recommendations

It is possible to restructure the financial system, which would lead to faster economic development and a reduction in the wealth gap. The expansion and success of the national economy depend on the development of the financial sector. While this is currently happening, fighting corruption is crucial to increase the likelihood that financial sector reform will promote financial development, which in turn will improve economic growth and reduce the income gap between rich and poor. The government may be able to develop a successful anti-corruption policy if it identifies the factors that influence financial institutions' attitudes towards corruption. For all these reasons, empirical studies have been conducted since the 2000s to examine the origins, consequences and economic impact of corruption in the public sector. It is therefore crucial to examine the impact of the mediating factor of corruption perception on financial development, despite the extensive research on the relationship between corruption and development.

Conclusion: The objective of this study was to examine the relationship between financial development and income inequality in Malaysia during the period 1995-2021. The study contributes to the literature by applying the Demean method for interaction terms to control for multicollinearity. It also examines the moderating role of corruption control on the relationship between financial development and income inequality. The empirical results show that the relationship between financial development and income inequality is consistent with the Kuznets hypothesis supported by Ridzuan, et. al (2021), which has an inverted U-shape. This implies that financial institution deepening and transparency are critical to the distribution of income inequality in Malaysia. Accordingly, as an emerging economy, Malaysia is encouraged to promote policies to improve institutional development to support both economic growth and equity in income distribution and ensure sustainable development. This empirical result is also consistent with that of Chisadza and Mduduzi (2022) for emerging economies: Financial depth and accessibility of both financial

institutions and financial markets reduce income inequality, but financial market efficiency has the opposite effect on inequality. Financial deepening, accompanied by more accessible financial systems, creates an inclusive financial sector in emerging markets that can reduce income inequality. However, emerging economies are growing fast, which means that a high level of financial development, while not hindering capital accumulation, can lead to a loss of efficiency in capital allocation.

The problem of corruption has its origins in the policies that have been implemented since the establishment of Malaysia. The World Bank's Corruption Indicator and Transparency International's Corruption Perceptions Index (CPI) are used to determine the extent of corruption in Malaysia.

Although corruption remains pervasive in Malaysia, efforts have been made to put in place institutional structures, legal protections and policies to prevent it. By examining the impact of corruption and financial development on inequality, this study contributes significantly to a better understanding of the relationship between financial development and income inequality in Malaysia. The second way this study contributes to the literature is by showing how corruption affects financial development in Malaysia. Thus, this study could support efforts to combat corruption in Malaysia. The need to study the role and importance of financial development in Malaysia stems from the prevalence and influence of the problem of "too much finance". Indeed, corruption has been declared as one of the most important issues in Malaysia and is used by Malaysians in various fields, especially in the age of technology. Therefore, corruption indirectly affects certain areas of development such as the economy, employment, education, politics, tourism and media, etc.

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