Effect of Foreign Direct Investment, Energy Consumption and Unemployment on Income Distribution in Malaysia

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Abstract: The paper analyses the relationships between Foreign Direct Investment (FDI), Energy Consumption, Unemployment, and their effects on Income Distribution in Malaysia from 1990-2022. Despite economic growth, Malaysia faces income inequality, especially among ethnic groups. The study uses ARDL regression to find that FDI promotes income distribution by creating jobs and facilitating technology transfer. Increased energy availability boosts industrial production, which is crucial for equitable income distribution. High unemployment, particularly among graduates, exacerbates income inequality. Government initiatives aim to address unemployment through skills enhancement and entrepreneurship. The study concludes that FDI and energy consumption positively influence income distribution, while unemployment has a negative impact. The findings are valuable for policymakers in fostering inclusive growth and equitable income distribution in Malaysia. As Malaysia is an export-oriented country, these insights can lead to impactful improvements in the export sector, further boosting employment opportunities and economic resilience.

Keywords: *Income Distribution; Energy Consumption, Foreign Direct Investment, Unemployment*

1. Introduction and Background

Income distribution is a crucial measure of economic health and social equality, reflecting how wealth and resources are allocated within a population (Butt et al., 2022). In Malaysia, historical economic disparities originated during colonial times when different ethnic groups were assigned specific economic roles: the Chinese in trade and industry, Indians in plantation agriculture, and Malays in subsistence farming. Post-independence, the New Economic Policy (NEP) of 1971 aimed to address these disparities by enhancing the economic participation of Malays and other indigenous groups (Bumiputeras) through affirmative action (Mamun et al., 2020). Although the NEP reduced extreme poverty and increased Bumiputera's economic involvement, structural imbalances and urban-rural disparities persisted. The Gini coefficient, measuring income inequality from 0 (perfect equality) to 1 (perfect inequality), showed a downward trend in Malaysia over recent decades inequality (Azam et al., 2021; Esquivias et al., 2022; Rahman et al.,2022). In the 1970s, the coefficient was around 0.51 but improved to 0.39 by 2019 due to economic development and government initiatives. Despite progress, income inequality remains exacerbated by the COVID-19 pandemic, which intensified job losses among low-income groups (Masseran et al., 2019). The government responded with stimulus packages and financial aid, but long-term impacts on income distribution are yet to be fully seen. The pandemic also accelerated Malaysia's digital transformation, highlighting the need to bridge the digital divide. Foreign Direct Investment (FDI) has been crucial for Malaysia's economic growth, especially in manufacturing, services, and high-tech sectors (Malik and Tamat, 2019). Although FDI declined during the pandemic, recovery signs were evident in 2021 and 2022. The oil and gas sector and investments in renewable energy and tourism remain significant for FDI. Energy consumption, predominantly from fossil fuels, is essential for economic growth (Abbas et al., 2022). Malaysia's energy intensity is high compared to global standards, though it has improved. The government's focus on sustainability reflects efforts to reduce carbon emissions (Ali, 2022). Unemployment has varied over time, peaking at 5.3% in May 2020 due to the pandemic. Youth and gender disparities in unemployment highlight ongoing inequality issues.

The literature on the impact of Foreign Direct Investment (FDI) on income distribution presents mixed views. Some research suggests that FDI promotes equal income distribution, while other studies indicate it exacerbates income inequality. In Malaysia, evidence on the relationship between foreign investment and income inequality needs to be clarified, with findings suggesting that FDI might influence income inequality directly or indirectly through its effects on economic growth. This highlights the need for further investigation into this complex relationship. Another significant factor influencing income inequality is the energy market. There is a notable dynamic between energy consumption and income distribution. The use of renewable energy

has been linked to reductions in income inequality, as energy security—ensuring a reliable and stable supply of energy at reasonable prices—plays a crucial role in economic and social development (Rodon et al., 2021). Energy is essential for domestic activities such as lighting, cooking, and heating. Disruptions in energy access can severely impact households, affecting their social and economic well-being. Therefore, understanding how energy consumption affects income inequality is crucial for policymakers. Malaysia's economy is driven by a robust export industry, which generates a lot of job possibilities, particularly in the manufacturing and services sectors. The nation supports industrial growth by ensuring a steady supply of resources through a strategic energy policy. These measures promote economic growth and raise living standards while helping Malaysia maintain its competitiveness on the world stage.

The research gap this study addresses is the limited exploration of the combined effects of foreign direct investment (FDI), energy consumption, and unemployment on income distribution in Malaysia. While previous studies may have examined these factors individually, more comprehensive research needs to analyze their interconnected impact over an extended period, particularly from 1990 to 2022. This study seeks to fill that gap by providing a holistic understanding of how these variables collectively shape income inequality in Malaysia, which is crucial for informed policymaking. It seeks new insights into addressing income inequality, a significant concern for the Malaysian government. Whether strategies to attract more FDI, enhance energy access, and reduce unemployment will effectively address income inequality remains to be seen. The government aims to implement strategies to lower the Gini coefficient and improve income distribution (Sani et al., 2020). Understanding the underlying causes of income inequality is essential for developing effective policies and refining existing ones. This study focuses on three key variables—FDI, energy consumption, and unemployment—to evaluate their effects on income inequality.

2. Literature Review

Income Distribution In Malaysia
The relationship between economic growth and income distribution has been a central focus of economic research, with the "Kuznets Curve" being one of the most influential hypotheses in this domain. Proposed by Simon Kuznets in 1955, the Kuznets Curve posits that income inequality follows an inverted U shape as a country progresses through different stages of economic development. According to Kuznets, income inequality tends to rise during the initial phases of economic growth. This increase is attributed to structural transformations within the economy, where a shift from agriculture to industrialization typically benefits a minority with capital or skills suited to the emerging sectors, leaving the majority initially behind.

The Relationship Between Foreign Direct Investment of Malaysia and Income Distribution
Developing and transitioning countries increasingly see FDI as a role in economic development, modernization, income growth, and job creation. The Solow-Swan model highlights its role in increasing capital formation, technological progress, and productivity. According to Solow (1956) and Swan (1956), FDI contributes to economic growth by bringing in new technology, managerial expertise, and investment capital, increasing the host economy's productive capacity. This influx of capital and knowledge can lead to higher economic growth rates as domestic industry benefits from increased efficiency and innovation (Bekmurodova, 2020). Foreign direct investment (FDI) can support long-term income growth through productivity impacts and technology spillovers. There are two ways that the productivity spillover from FDI can impact the development of regional income. The first is through the vertical engagement of international and domestic businesses, fostering stronger ties and spillovers with clients and suppliers. Second, because local businesses gain from the demonstration, foreign enterprises can provide spillovers to domestic businesses operating in the same industry through horizontal partnerships.

Empirical studies indicate that FDI has been a significant driver of economic growth in Malaysia, contributing substantially to the country's industrialization and modernization efforts. Hira et al. (2019) document how FDI has facilitated Malaysia's transition from an agriculture-based economy to an industrially diversified one. However, the distribution of these benefits has been uneven. FDI in Malaysia has predominantly flowed into manufacturing sectors, particularly the electronics and petroleum industries. Ismail (2001) notes that these sectors have created numerous jobs and increased wages, contributing to economic growth. While FDI can create jobs and stimulate economic growth, there is a concern that it may exacerbate income inequality if not

adequately managed. Referring to Rasiah, Asirvatham, and Adamu (2017), policymakers in Malaysia need to implement measures that promote inclusive growth and ensure that the benefits of FDI are shared among all segments of society. One way to achieve this balance is through targeted policies encouraging FDI in sectors with a high potential for job creation and value addition. The inverse link implies that macroeconomic volatility may exacerbate the income gap in Africa. Malik and Tamat (2020) investigated the effects of FDI on wealth inequality and the ability of relationship-dependent children to absorb information using data from 54 countries between 1980 and 2005. Studies from Mukaramah-Harun (2015) show that although FDI has contributed to overall economic growth and development, it has also increased income inequality in specific periods and regions. This observation implies that FDI can increase income disparity when a country first develops but reduce inequality as development continues.

H₁: There is a positive relationship between Foreign Direct Investment in Malaysia and Income Distribution.

The Relationship Between Energy Consumption in Malaysia and Income Distribution

The economic literature well documented the relationship between energy consumption and economic growth. Utilizing sophisticated econometric models and statistical techniques, Walheer's studies reveal that fluctuations in energy consumption can lead to substantial variations in economic output. This theoretical framework posits that energy is not merely an ancillary input but a core driver of economic activity. For instance, when there is an increase in energy availability, it can significantly boost industrial production by enabling factories to operate at higher capacities and allowing businesses to expand their operations. This theoretical framework is particularly pertinent. Malaysia's rapid industrialization and economic development have historically been closely linked to its energy consumption patterns. Recent research by Rahman et al. (2017) and empirical studies on Malaysia corroborate Walheer's findings, demonstrating a strong correlation between energy consumption and economic growth.

Recent arguments highlight that as Malaysia continues to advance towards a knowledge-based economy, the role of energy in supporting technological innovation becomes even more critical (Shadman et al., 2021). Access to reliable and affordable energy is essential for powering high-tech industries and supporting digital transformation initiatives. This is particularly relevant in electronics, biotechnology, and information and communication technology (ICT), where energy-intensive processes are fundamental to production and innovation. Research by Schulte and Heindl (2017) indicates that low-income families tend to exhibit weaker responses to price fluctuations than high-income households. Environmental degradation, such as air and water pollution from fossil fuel use, disproportionately impacts low-income communities that may lack the resources to mitigate these impacts. Promoting sustainable practices in industries that heavily contribute to carbon emissions could positively affect the environment and income distribution (Ran & Xu, 2023). By incentivizing businesses to adopt greener technologies and reducing their reliance on fossil fuels through policies targeting greenhouse gas reductions, Malaysia could create an ecosystem where resources are allocated more equitably while mitigating climate change risks (Ismail et al., 2020). The findings suggest that increased consumption of renewable energy reduces income inequality.

H₂: There is a positive relationship between Malaysia's energy consumption and income distribution.

The Relationship Between Unemployment in Malaysia and Income Distribution

Unemployment refers to being without a job, while income distribution refers to how income is divided among individuals or households in a society (Janice et al., 2021). Phillips Curve Theory, formulated by economist A.W. Phillips in 1958, proposed an inverse relationship between unemployment and inflation. According to this theory, when unemployment is low, labor becomes increasingly scarce, causing employers to compete for workers by raising wages. Higher wages increase consumer purchasing power, leading to higher demand for goods and services, which can then raise prices, resulting in inflation. Conversely, when unemployment is high, the pressure on wages is reduced, and inflation tends to be lower (Sreenu, 2023). This theory suggests policymakers face a trade-off between reducing unemployment and controlling inflation.

Recent studies and empirical evidence suggest that Phillips Curve dynamics can be observed in the Malaysian economy (Fung & Nga, 2023; Norhashim et al., 2019; Ghorpade et al., 2024). For example, a period of low unemployment in Malaysia has been linked to rising wages, particularly in sectors experiencing labor shortages, such as manufacturing, construction, and services. Recent arguments highlight that the relationship between unemployment and inflation in Malaysia is influenced by several factors, including global economic

conditions, labor market dynamics, and policy interventions (Hassan et al., 2023). For example, external shocks such as international oil price fluctuations can affect inflation independently of the domestic unemployment rate. Chan and King (2020) claimed fewer job opportunities are often available if high unemployment rates are high. This can result in a higher concentration of wealth among those employed, leading to an unequal income distribution. Law (2018) states income inequality can also impact unemployment rates. The primary sector offers stable, high-paying jobs with benefits, while the secondary sector consists of low-paying, unstable jobs with minimal benefits. The findings suggest a negative relationship between unemployment and income distribution in Malaysia.

H3: There is a negative relationship between Unemployment in Malaysia and Income Distribution.

3. Research Methodology

Data and Variables Explanation
Due to data availability, this study used annual data from 1990 to 2022 as a sample period. A summary of the data and its sources is shown in Table 1 below.

Table 1: Variables description

Variables	Indicator	Source
Income Distribution	Gini coefficient index (GINI)	World Development indicators
Foreign Direct Investment	Foreign direct investment, net inflows (% of GDP)	World Development indicators
Energy Consumption	Energy use	World Development indicators
Unemployment	Unemployment rate	World Development indicators

Note: The GINI index values range from 0 to 100, where 0 represents perfect equality while 100 represents perfect inequality. The higher the value of the coefficient, the higher the degree of inequality

Estimation Procedures
The general functional form of the income distribution model for Malaysia was derived as follows:

$GINI_t = f(FDI_t, ENC_t, UE_t,)$

where

$GINI_t$ represents income distribution,
FDI_t represents foreign direct investment inflows,
ENC_t represents energy consumption,
UE_t represents unemployment.

The variables in Equation were transformed into log-linear forms (LN). The log version of the variables indicates the short-run and long-run elasticity. The log version of the model derived from the Equation can be seen as follows:

$LNGINI_t = \beta_0 + a_1 LNFDI_t + b_2 LNENC_t + s_3 LNUE_t + \varepsilon_{it}$

FDI is crucial in boosting economic growth and improving citizens' living standards (Azam et al., 2021; Esquivias et al., 2022; Rahman et al.,2022). Foreign direct investment (FDI) has emerged as a critical driver of economic growth and development in countries worldwide. FDI refers to the investment made by individuals, businesses, or governments from one country into another to establish a lasting interest in the host country. Energy consumption plays a crucial role in shaping the income distribution dynamics of a country like Malaysia. The impact of energy consumption on income distribution dynamics cannot be understated, especially in Malaysia. Energy consumption affects the economy and significantly affects how wealth is distributed among different segments of society. How we produce and consume energy directly impacts job creation, economic growth, and access to essential services (Ayomitunde et al., 2021). Understanding the relationship between unemployment and income distribution is crucial for policymakers and economists alike. Unemployment refers to being without a job, while income distribution refers to how income is divided among individuals or households in a society (Janice et al., 2021). The two concepts are interconnected, as high levels of unemployment can lead to unequal income distribution and vice versa. Chan and King (2020) claimed fewer job opportunities are often available if high unemployment rates are high. As for these studies, we expected a positive sign between FDI and energy consumption towards income distribution. To conclude, unemployment is expected to impact income distribution negatively.

The cointegration of the variables in the study was examined using an autoregressive distributed lag (ARDL) bound test. ARDL was applied to determine the cointegration of short-run and long-run relationships between variables. ARDL is relevant for small data sets and undertakes the variable's integration order at I(0) or I(1). The ARDL model based on the unrestricted error correction model (UECM) is stated below:

$$\Delta LNGINIt = \beta_1 + \theta_0 \, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} +$$

$$S\Delta LNGINI_{t-i} + \sum_{i=0}^{b} \alpha_i \, \Delta LNFDI_{t-i} + \sum_{i=0}^{c} \gamma_i \, \Delta LNENC_{t-i} \sum_{i=0}^{d} \lambda_i \, \Delta LNUE_{t-i} + u_t$$

$$\Delta LNFDIt = \beta_1 + \theta_0 \, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} +$$

$$the \sum_{i=1}^{a} \beta_i \, \Delta LNFDI_{t-i} + \sum_{i=0}^{b} \alpha_i \, \Delta LNGINI_{t-i} + \sum_{i=0}^{c} \gamma_i \, \Delta LNENC_{t-i} \sum_{i=0}^{d} \lambda_i \, \Delta LNUE_{t-i} + u_t$$

$$\Delta LNENCt = \beta_1 + \theta_0 \, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} +$$

$$\sum_{the \ i=1}^{a} \beta_i \, \Delta LNENC_{t-i} + \sum_{i=0}^{b} \alpha_i \, \Delta LNGINI_{t-i} + \sum_{i=0}^{c} \gamma_i \, \Delta LNFDI_{t-i} \sum_{i=0}^{d} \lambda_i \, \Delta LNUE_{t-i} + u_t$$

$$\Delta LNUEt = \beta_1 + \theta_0 \, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} +$$

$$\sum_{i=1}^{a} \beta_i \, \Delta LNUE_{t-i} + \sum_{i=0}^{b} \alpha_i \, \Delta LNGINI_{t-i} + \sum_{i=0}^{c} \gamma_i \, \Delta LNFDI_{t-i} \sum_{i=0}^{d} \lambda_i \, \Delta LNENC_{t-i} + u_t$$

Where Δ is the first difference operator, and it is the white-noise disturbance term? Residuals for the UECM should be serially uncorrelated, and the model should be stable. The diagnostic tests listed in the analysis section can be used to address this validation. According to the primary model, historical values might affect and clarify the income distribution (LNGINI) level. It, therefore, involves additional shocks or disruptions. The long-run elasticity from the UECM estimation equals the coefficient of the one-lagged dependent variable divided by the coefficient of the one-lagged explanatory variable (multiplied by a negative sign). The first differenced variable's coefficients capture the short-term effects. In the long-term connection, the null of no cointegration is defined as follows:

Hypothesis H0 (H0). Income Distribution = FDI = Energy Consumption = Unemployment = 0 (there is no long-run relationship), is
tested against the alternative.
Hypothesis H1 (H1). Income Distribution ≠ FDI ≠ Energy Consumption ≠ Unemployment ≠ 0 (a long-run relationship exists).

Assume the calculated F-statistic is smaller than the lower-bound critical value and apply the well-known F-test. Then, we do not rule out the null hypothesis of no cointegration. However, consider that the calculated F-statistics are higher than the 10% significant level's upper bound critical value. We then reject the null hypothesis that there is no cointegration.

4. Results

As with other time series analysis processes, the first step usually involves determining the unit root of each variable that will be studied. The data's stationarity was determined using two-unit root tests: Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF). The unit root tests show that the energy use, FDI, and Gini coefficient are I(1) variables because they are non-stationary at their levels but become stationary after first differencing. This indicates that to attain stationarity, these variables must be differentiated due to their stochastic trend. We moved on to the PP unit root test since it was thought to be more effective than the ADF unit root test because of the mixed stationarity of this result. The mixed stationarity trend is once more identified for the PP unit root test at the level, intercept, and trend. Therefore, we deduced that the mixed stationarity model—also referred to as ARDL estimation—satisfies the criterion for a bound test.

Table 2: Testing ADF and PP unit root

| | Unit Root Test | | | |
| Variable | Augmented Dickey-Fuller | | Phillips-Perron | |
	Level	1st Difference	Level	1st Difference
Gini	-0.986 (0)	-5.542 (0) ***	-0.986 (0)	-5.624 (3) ***
FDI	-4.773 (0) ***	-6.449 (1) ***	-4.767 (2) ***	-24.954 (28) ***
Energy use	-2.410 (2)	-5.997 (0) ***	-4.513 (13) ***	-6.807 (6) ***
Unemployment	-2.383 (0)	-4.107 (0) ***	-2.253 (4)	-3.563 (9) **

Note: 1. ** and *** 5% and 1% of significant levels, respectively. 2. The optimal lag length is selected automatically using the Schwarz info criteria (SIC) for the ADF test. The bandwidth was selected using the Newey–West method for PP.

Next, we need to determine whether long-run cointegrating exists for our suggested model before moving on to ARDL short—and long-term forecasting. The F statistic validated the long-run cointegrating link between LNGINI, LNFDI, LNENC, and LNEU. At a 10% significance level, a long-run cointegrating vector in this model is validated by the F statistic of 3.925, which is more significant than the 10% threshold based on the income distribution model. The income distribution model will be the exclusive foundation for the following study.

We performed several diagnostic tests, including the serial correlation, multicollinearity, heteroscedasticity, normality test, and CUSUM/CUSUMSQ test, to ensure we could generate a trustworthy result. The results are shown in Figure 1, Tables 3, 4, and 5. It is verified that the model is free of all diagnostic issues since the probability value of every test is more than the 10% significant level. The blue line within the two dotted lines in the CUSUM and CUSUMSQ tests shows the model's short- and long-term stability.

Table 3: Diagnostic Test 1

Model	Lag Order	F Statistic
LNGINI = f (LNFDI, LNENC, LNUE)	(1, 1, 1, 2)	3.926**
LNFDI= f (LNGINI, LNENC, LNUE)	(1,0,1,0)	7.363**
LNENC= f (LNGINI, LNFDI, LNUE)	(1,0,0,0)	6.252**
LNUE= f (LNGINI, LNFDI, LNENC)	(1,0,0,0)	3.642
Critical Values for F Stat	Lower I (0)	Upper (1)
10%	2.37	3.2
5%	2.79	3.67
1%	3.65	4.66

Note: The critical values are based on Pesaran et al. (2001), case III: unrestricted intercept and no trend. 2. k is several variables equivalent to 6. 3. **and *** represent 5% and 1% significance, respectively. Estimation was based on the Schwarz criterion (SC). The maximum lag set is (2, 2).

Table 4: Diagnostic Test 1

| (A)	(B)	(C)
Normality	Autocorrelation	Heteroskedasticity
[p-Value]	[p-Value]	[p-Value]
1.281884	0.021545	1.173274
[0.52679]	[0.9446]	[0.0018]

Note: The diagnostic test performed as follows: A. based on a test of skewness kurtosis of residuals; B. Breusch-Godfrey Serial Correlation LM Test; C. ARCH Test.

Table 5: Diagnostic Test 2

(D) Variable	Coefficient Variance	Uncentered VIF	Centered VIF
FDI	1.08E-20	7.272539	1.827202
ENERGY_USE	5.05E-07	36.62504	1.653174
UNEMPLOYMENT	0.568194	82.39304	1.136360

Note: The diagnostic test performed as follows: D. Multicollinearity Variance Inflation Factors

Figure 1: CUSUM and CUSUMQ
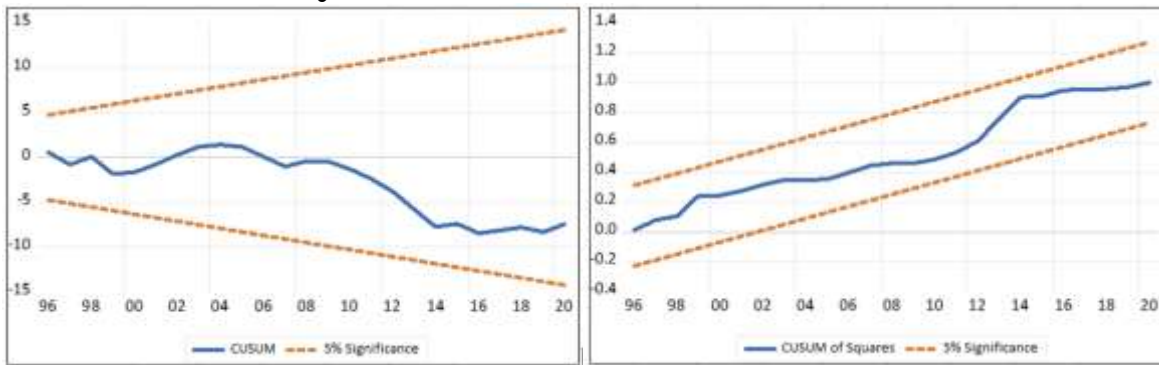
After confirming the model's reliability, we were ready to proceed with Auto Regressive Distributed Lag Models. In the short run, the elasticity coefficients indicate the immediate effects of changes in FDI, energy consumption, and unemployment on income distribution. The coefficient for the first difference of FDI is -0.005, which implies a negative but statistically insignificant short-run impact of FDI on income inequality. This suggests that short-term fluctuations in FDI do not significantly influence income distribution in Malaysia, consistent with findings by Borensztein et al. (2017) that emphasize the importance of absorptive capacity and the longer-term impacts of FDI on economic outcomes. The coefficient for the first difference in energy use is -0.046, indicating a negative short-run relationship between energy consumption and income inequality. Although this relationship is not statistically significant, the negative coefficient suggests that reduced energy use may initially influence income inequality, possibly due to the uneven distribution of benefits from energy-intensive industries. This reflects the complex nature of energy's impact on economic distribution, as discussed by Sadorsky (2010). The coefficient for the first unemployment difference is -0.035, showing a negative but statistically insignificant short-run effect on income inequality. This suggests that short-term changes in unemployment rates do not strongly affect income distribution, supporting the argument by Blanchard and Katz (1992) that labor market adjustments and their impact on income inequality are typically observed over more extended periods.

The CointEq(-1) coefficient, representing the speed of adjustment towards long-run equilibrium, is -0.477 and statistically significant at the 5% level. This indicates that approximately 47.7% of the disequilibrium from previous periods' shocks is corrected within the current period, highlighting a moderate adjustment speed toward equilibrium. This finding is consistent with the adjustment dynamics observed in similar studies, such as Narayan and Smyth (2006).

The long-run elasticity coefficients offer more robust insights into the relationships between the variables over an extended period. The long-run coefficient for FDI is -0.030, statistically significant at the 5% level, suggesting that an increase in FDI is associated with a reduction in income inequality over time. This finding aligns with the literature emphasizing the potential of FDI to foster economic growth and reduce inequality, particularly in developing countries, as highlighted by Chintrakarn et al. (2019). The long-run coefficient for energy use is -0.194, which is also significant at the 5% level, indicating that higher energy consumption is associated with decreased income inequality in the long run. This result may reflect the role of energy in supporting industrial activities that generate widespread economic opportunities, a relationship corroborated by the studies of Apergis and Payne (2021). The long-run coefficient for unemployment is 0.082, which is not statistically significant. This suggests that unemployment does not have a considerable long-term impact on income

inequality in Malaysia, consistent with studies that find mixed evidence regarding the relationship between unemployment and income distribution, such as those by Galbraith and Kum (2015).

The constant term in the long-run equation is 5.853 and is highly significant, capturing the baseline level of the Gini coefficient when all other variables are held constant. This aligns with the general observation that baseline income inequality can persist despite fluctuations in different economic variables.

Table 5: Short Run and Long Run Elasticities

Short-Run Elasticities		Long-Run Elasticities	
Variables	**Coefficient**	**Variables**	**Coefficient**
D(LFDI)	-0.005	LFDI	-0.030**
D(LENERGY_USE)	-0.046	LENERGY_USE	-0.194**
D(LUNEMPLOYMENT)	-0.035	LUNEMPLOYMENT	0.082
CointEq(-1)*	-0.477**	C	5.853**

Note: 1. ***, **, and * are 1%, 5%, and 10% of significant levels, respectively.

Discussion
First, the relationship between FDI and income distribution was significantly negative. This implies that an increase in FDI leads to a reduction in income inequality in Malaysia. Descriptive statistics reveal that over the observed period, substantial foreign capital inflows were observed. This influx of investment will likely contribute to economic growth and job creation, thus increasing income distribution. The regression coefficient indicates that each unit increase in FDI significantly reduces the Gini coefficient, a general measure of income inequality. This finding supports the hypothesis that FDI is vital in stimulating economic growth and promoting a more equitable distribution of wealth.

The study found that energy consumption has a similar negative effect on income inequality. Average energy consumption over the period reflects the country's increasing energy needs as its economy grew. The regression coefficient for energy consumption indicates that higher energy consumption is correlated with a reduction in the Gini coefficient. This relationship can be linked to the role of energy in driving industrial and economic activity, which in turn creates jobs and improves living standards. The study proved that ensuring access to affordable and reliable energy can help reduce production costs, lower the prices of goods and services, and ultimately contribute to a more equitable income distribution.

Unemployment, on the other hand, has been found to exacerbate income inequality. The average unemployment rate during the study period reflected the varying conditions of the labor market. The regression coefficient for unemployment indicates that a higher unemployment rate significantly increases the Gini coefficient. These findings underscore the critical importance of addressing unemployment to improve income distribution. High unemployment reduces household income and limits access to essential services and opportunities for upward mobility.

5. Managerial Implications and Recommendations

By aligning their strategies with broader socio-economic goals, companies can play an essential role in promoting equitable income distribution for organizations operating in Malaysia. This can involve investing in regions with high unemployment rates, adopting inclusive employment practices, and supporting local communities through corporate social responsibility (CSR) initiatives. Additionally, by integrating sustainability into their operations, companies can contribute to reducing the negative impact of energy consumption on income distribution. By adopting such practices, organizations can improve their corporate image and contribute to Malaysia's socio-economic development.

Malaysia also needs to shift towards more sustainable energy use practices. Policymakers should focus on promoting energy efficiency and investing in renewable energy sources. This can help reduce production costs, lower the prices of goods and services, and reduce adverse effects on income distribution. Malaysia can ensure

more equitable economic development by fostering a sustainable energy sector. This study emphasizes the importance of job creation and workforce development programs. Policymakers should prioritize initiatives that improve job skills, provide vocational training, and stimulate sectors with high employment potential. In addition, encouraging entrepreneurship and small business development can create job opportunities and contribute to a more balanced income distribution. By addressing unemployment, Malaysia can take essential steps towards reducing income inequality and fostering inclusive growth.

Future research can build on these findings by incorporating additional variables such as education, healthcare, and technological progress. Education, for example, plays a crucial role in income distribution by equipping individuals with skills that enhance their employability and earning potential. Higher levels of education can lead to more equitable income distribution by reducing income disparities between different segments of the population. Healthcare, on the other hand, impacts income distribution by influencing the productivity and economic participation of the workforce. Access to quality healthcare can reduce income inequality by ensuring that everyone, regardless of socioeconomic status, can contribute effectively to the economy. Technological progress is another critical factor that can significantly impact income distribution. Technological advancements can increase productivity and economic growth, creating more job opportunities and higher wages.

Conclusion
This research has carefully analyzed the effects of Foreign Direct Investment (FDI), energy consumption, and unemployment on income distribution in Malaysia. The relationship between FDI and income distribution was found to be significantly negative. This finding supports the hypothesis that FDI is vital in stimulating economic growth and promoting a more equitable distribution of wealth. As Malaysia continues to attract foreign investment, it is indispensable to ensure that such investment is channeled into sectors that generate extensive employment opportunities and foster inclusive growth. However, ensuring that FDI is directed to sectors that generate substantial employment and promote inclusive development is crucial. In addition, the government should create a conducive environment for investors by improving infrastructure, streamlining regulations, and ensuring political stability.

The study found that energy consumption has a similar negative effect on income inequality. This relationship can be linked to the role of energy in driving industrial and economic activity, which in turn creates jobs and improves living standards. The findings on energy consumption highlight the need for sustainable energy policies. Malaysia can sustain economic growth by promoting energy efficiency and investing in renewable energy sources while minimizing environmental impact. Ensuring access to affordable and reliable energy can help reduce production costs, lower prices of goods and services, and ultimately contribute to a more equitable income distribution.

Unemployment, on the other hand, has been found to exacerbate income inequality. High unemployment reduces household income and limits access to essential services and opportunities for upward mobility. The government should focus on job creation, skill development, and labor market reforms to reduce unemployment. Investing in vocational education and training can equip the workforce with the skills needed to thrive in a dynamic economy, thereby reducing unemployment and promoting equitable income distribution.

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