# An Empirical Study on the Impact of Malaysian Foreign Direct Investment on Joblessness

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## Abstract

Foreign direct investment is an investment that comes from another country to buy assets or invest in business interests in that country. FDI is different from other types of investment, like portfolio investment, in that it entails a long-term commitment and control over the foreign business entity. An important factor in a nation's development is FDI, which promotes economic expansion, draws in outside capital, creates job opportunities, transfers knowledge and technical innovations, and enhances infrastructure. By attracting FDI, Malaysia may increase exports, diversify its economy, and improve its competitiveness globally. Moreover, FDI has the capacity to support the expansion of vital industries and sectors in Malaysia, therefore advancing the country's prosperity and sustainable development. Every country has a different FDI and unemployment rate. Consequently, this study will use the autoregressive distributed lag (ARDL) and vector error correction model (VECM) methods to determine the real relationship between FDI and the unemployment rate in Malaysia from 1982 to 2020. The analysis found that the increase in FDI inflows to Malaysia also increases the unemployment rate. This result contradicts the previous study, where FDI inflows stimulate the economy by boosting job opportunities. However, this result based on Malaysian data may explain that the major FDI inflows are relatively higher in brownfield investments than in greenfield investments, such as the joint venture between Geely and Proton.

**Keywords**: Unemployment, Foreign Direct Investment, Malaysia, Public Policy

## 1.0 Introduction

Investment from several nations has been drawn to globally linked financial markets with open access. Put differently, FDI refers to investments made by a single nation abroad to generate economies of scale, expand its product market, and reap financial rewards. According to Shaari et al. (2012), FDI is crucial for increasing investment and economic expansion in a nation. According to the OECD (2008), the entry of more volume of FDI into a country can provide wider benefits to the economy, including positive economic growth, better income distribution, and the opening up of more job opportunities.

FDI is a key factor in driving higher economic growth in developing countries.

It is critical to determine the key attributes of a country that are significant to foreign investors and examine the impact of FDIs on economic features. A prior study found that FDI is influenced by a country's employment or unemployment rate and its inflation rate to determine macroeconomic stability (Brozen, 1958). As a result, researching the relationship between FDI and macroeconomic stability is crucial. For evaluating the economic situation, this study uses unemployment as an alternative to measure the strength of the macroeconomic landscape. Malaysia was chosen because the country's FDI influx is trending downward. Due to the uncertainty in the global economic situation, i.e., the Covid-19 epidemic and the Russia-Ukraine war, the global economy is slowing down quickly, causing international investors to reduce their spending.

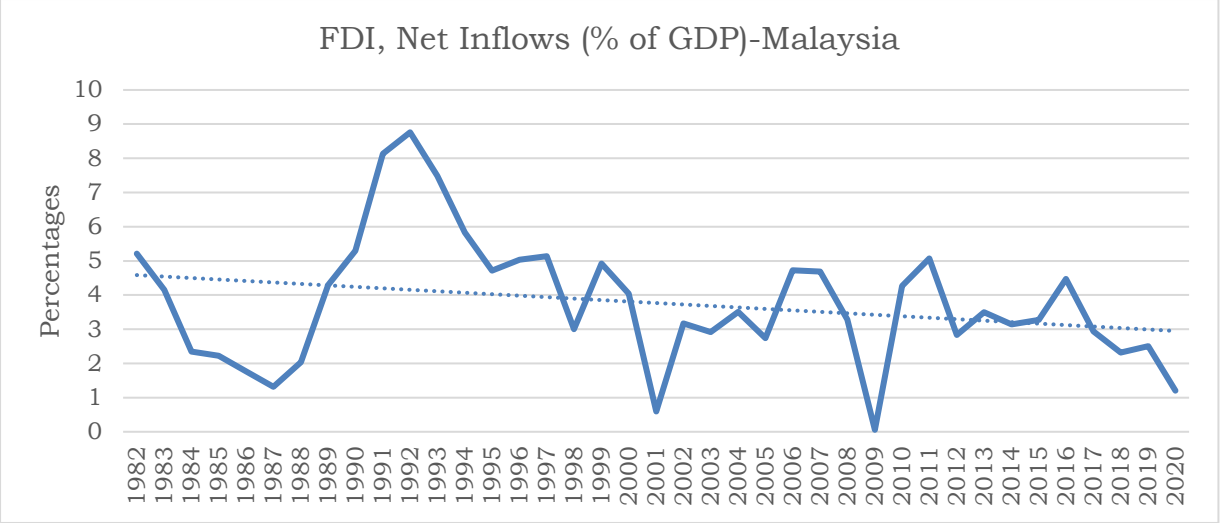


Figure 1. The net inflow of FDI as a Percentage of GDP in Malaysia (Source: World Development Indicators)

The initial Malaysian government policy was to use the FDI in economic development policies and access to higher technology from foreign countries and capitals. The net inflow of FDI into Malaysia from 1980 to 2020 is seen in Figure 1. Due to the global recession and the 1987 electronic crisis, the net inflow of FDI began to decline in the 1980s and continued to do so until 1988. FDI inflow managed to increase in 1993; however, FDI became increasingly weak during the Asian Financial Crisis. FDI continued to plummet in 2001 due to investors' concerns about the future of the Malaysian economy following the events that occurred on September 11, 2001, at the World Trade Center. This resulted in an unpredictable net inflow of FDI following the incident from 2002 to 2005. As we can see, FDI is very sensitive to any economic crisis leading to the withdrawal of FDI from any country (Lim, 2001; Mariana, 2011; Tsinaridze & Makharadze, 2023). At the same time, unemployment also took a hit with FDI outflow due to the economic crisis, leading to inflationary pressures, reductions, and higher unemployment rates in Malaysia, as per Figure 2. The unemployment rate in 2020 increased to 4.5% compared to the previous year's 3.26% due to the spread of the Covid-19 outbreak, which forced stringent lockdowns and layoffs. A causality pattern exists between FDI and unemployment (Strat et al., 2015).

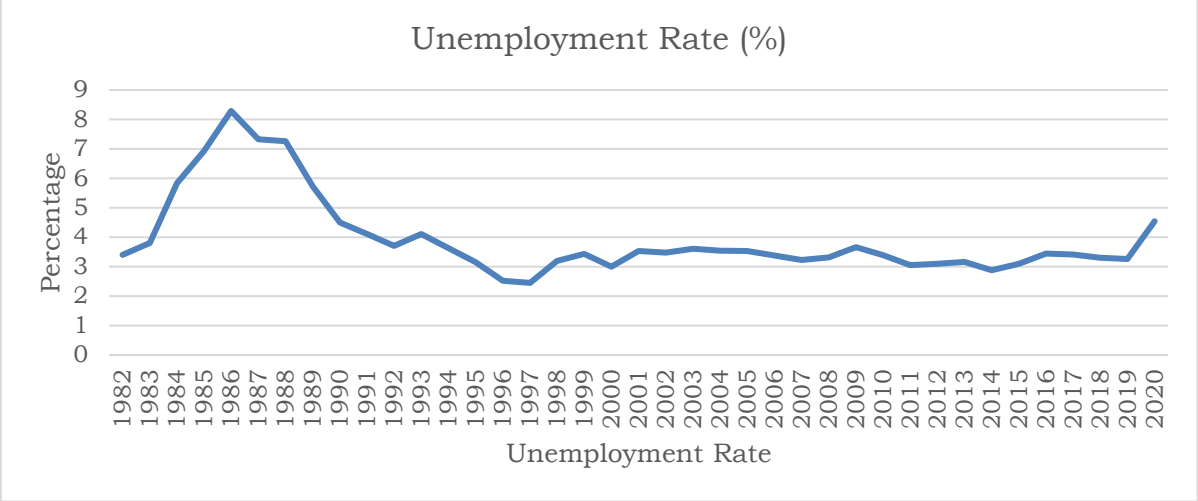


Figure 2: Unemployment rate in Malaysia from 1980 to 2020 (Source: World Bank (2023))

Therefore, this study looks at the relationships between Malaysia's unemployment rate and FDI net inflow to draw in more FDI. This paper were structured with a review of relevant literature, theoretical framework, methods, and empirical findings, and concluded.

## 2.0 Literature Review

### 2.1 Theoretical Review

Professor Arthur Cecil Pigou's 1933 "Theory of Unemployment," explains economic unemployment dynamics. This hypothesis indicates that worker pay demands above the equilibrium wage rate affect unemployment (Harrod, 1934). In other words, workers who demand greater salaries than the market equilibrium might cause unemployment. Using Pigou's theory, recent research has shown a positive association between FDI and unemployment, with a directional focus. Said et al. (2022) link unemployment to FDI. Higher unemployment might attract FDI. Blanchard (2022) illuminates this connection. A country with low unemployment provides foreign investors two benefits. First, there's more labour, which benefits sectors that need plenty of it. Second, lower unemployment rates may indicate a labour surplus, lowering pay demands. Foreign investors prefer nations with greater unemployment rates because they may access a bigger labour pool at cheaper prices. According to Pigou's idea, unemployment increases FDI. Unemployment and FDI are linked, highlighting the intricate interplay between labour market dynamics and foreign investment choices.

### 2.2 Empirical Review: Unemployment and FDI

Unemployment is a situation with less job availability and more job seekers (Ni et al., 2021). Unemployment become a widespread problem in many countries, and the high level of this issue is annoying developing countries. Malaysia saw the highest unemployment rate during the Covid-19 era in May 2020, impacting 826,100 persons (The Edge Markets, 2021). This proves the impact of unemployment on developing countries such as Malaysia. Ignorance of the unemployment issue in a country will lead to poor economic growth and negatively affect the socio-economic.

The previous research conducted by Voßemer et al. (2018) has shown that unemployment directly influences people's mental health and overall well-being. This impact is evident in several aspects, including homelessness, poverty, and familial relationships. Furthermore, financial constraints due to unemployment in society also bring other social issues such as criminal violence, prostitution, and alcohol abuse. Evans and Kelikume (2019) added that ignorance of unemployment in a country also becomes a factor of violence and terrorism in society.

In the economic literature, the connection between FDI and components of the labor market is a significant topic analyzed in the study of FDI and its impact on unemployment (Alalawneh & Nessa, 2020). A continuous negative correlation between unemployment rates and FDI levels has been demonstrated by several research. The FDI inflows help to decrease unemployment, especially for developing its advantage where better management with an inflow of capital improves the technologies and many sectors survive better in their field. A study by Mazher et al. (2020) in Pakistan found an adverse relationship between FDI and unemployment. This research indicates that international business in Pakistan provides people with more work opportunities, thereby reducing unemployment. In addition, research that has been conducted in Nigeria has found that a 1% increase in FDI can provide benefits in terms of an increase of 0.092% decrease in the unemployment rate based on data from 1980 to 2015. (Johnny et al., 2018).

Furthermore, a study conducted by Alalawneh & Nessa (2020) found that FDI is beneficial in terms of reducing the unemployment rate among both women and men in six countries in the Middle East and North Africa in the long term from 1990 to 2018 based on three economic models: the fixed effects model (FEM) and the random effects model (REM). However, FDI does not have a short-term effect between the two variables, based on the test results from the VAR Panel Model (Granger causality test).

A study produced by Ni et al. (2021) found that an economy will enjoy good benefits in terms of reducing the unemployment rate by 0.082 percent for every 1% of FDI inflows. Meanwhile, the same results also occurred in Pakistan conducted by Maqbool et al. (2013) found that FDI inflows can stimulate more job opportunities in economic sectors as well as reduce unemployment based on the Autoregressive Distributed Lag (ARDL) approach from 1976 to 2012.

On the other hand, the relationship between the two variables is also the same as that of several studies, such as Kamran (2014), who found that the presence of FDI has side effects on the economy, especially the unemployment rate. The study results show that any increase in the amount of FDI by 1% also increases by 0.45% in the unemployment rate, which is proven based on a multiple regression model. The exact form of relationship also occurs in the study of Trimurti (2015), Ziberi & Avdiu (2020), Bayar (2014), and Said et al. (2022), who found that the entry of FDI also increases the unemployment rate in the economy.

In addition, some earlier research has failed to find a relationship between FDI and unemployed people. Chang (2005) performed a research in Taiwan using the vector autoregression (VAR) technique. The study found no relationship between FDI inflow and unemployment from 1981:1 to 2003:3. research conducted by Rizvi and Nishat (2009), and Mehra (2013) using data from Pakistan and India found that FDI inflows do not have a significant effect on unemployment. This finding contradicts earlier studies that show an adverse relationship between FDI and unemployment. Aktar et al. (2009) conducted a study utilizing the VAR approach to determine the impact of FDI on the unemployment rate in Turkey from 2000:1 to 2007:4. Their findings indicate that FDI in Turkey was not successful in lowering the unemployment rate.

## 3.0 Methodology

This research analyzes the impact of foreign investment in Malaysia from 1982 to 2020 on the unemployment rate. The empirical study is predicated on assessing the likelihood of causation as well as the long- and short-term relationships between employment and FDI. Data for the study is collected from World Bank database (World Development Indicators 2022).

There are 3 steps in conducting the analysis of the effect of FDI on employment. First, using of the cointegration approach to spot the long-run relationship between FDI and unemployment. Second, using of Vector Error Correlation Model (VECM) is to determine the short-run relationship between FDI and unemployment. Third, using the Pairwise Granger Causality test to determine the correlation between FDI and unemployment.

For the estimation of the long-run relationship between FDI and unemployment, it is described in the following equation:

$$Unemployment_t = \alpha + \beta FDI_t + \varepsilon_t$$

## 3.1 Analysis Method

### 3.1.1 Unit Root Test

The most commonly used tests for unit root test are Dickey-Fuller (DF) test, Augmented Dickey-Fuller test (ADF, 1979), the Philips-Peron test (PP, 1988), and the Kwiatkowski test (KPSS, 1992). In this study, the stationary of the series at the level and first difference test was determined using the Augmented Dickey-Fuller (ADF) based on the Akaike Information Criteria (AIC). The alternative hypothesis will be accepted but the null hypothesis will be rejected if this stationary test is significant, indicating that the variable series is stationary and does not have a unit root test.

However, if the variable series fails the unit root test and the stationary test is not significant, the null hypothesis will be accepted since the variable series is non-stationary. The form for the hypothesis will be:

H0: $\delta = 0$ / There is a unit root test (not stationary)

H1: $\delta \neq 0$ / There is no unit root test (stationary)

The null hypothesis does not reject (the unit root test exits) if the t-statistic value is more than the ADF critical value, but the unit root test does not exist (the null hypothesis will be rejected) if the t-statistic value is less than the ADF critical value.

First, there are two tests of the unit root test: one at the level (unit root test at level with constant and one at the level with constant and trend), and the other at the first difference (unit root test at first difference with constant and unit root test at first difference with level and trend).

3.1.2 Lag Length Selection

Before running the causality test, it is compulsory to decide the optimal lag length. The optimal lag length criteria can be decided based on the Likelihood Ratio test (LR), Final Prediction Error (FPE), Akaike Information Criteria (AIC), Schwartz Bayesian Criteria (SC), and Hannan-Quinn information criteria (HQ). In this study, the AIC criterion will be used to decide the optimal lag. As Enders (1995) suggested, the optimal lag is selected based on the lowest values of AIC, SC, HQ criteria, and rejecting the null hypothesis in LR test that parameter values at lag k are equal to zero.

3.1.3 Cointegration Test

The Cointegration test was used to examine the long-run relationship between FDI and unemployment by using two approaches. The first model was created by Engle and Granger in 1987. The second model was created by Johansen in 1988 and Johansen and Juselius in 1990. The format for the hypothesis is:

$$H_0 = \delta = 0(not\ stationary\ for\ \widehat{\mu_t} or\ not\ cointegration\ if\ t_\delta > \tau$$

$$H_1 = \delta < 0(\ stationary\ for\ \widehat{\mu_t} or\ have\ cointegration\ if\ t_\delta < \tau$$

In this model, $\widehat{\mu_t}$ represents an error term, while is a critical t-statistic. The Engle-Granger procedure is employed to assess the stationarity of a variable at the residual term level. The Engle-Granger method does not solve the problem when multiple variables are cointegrated, whereas we assume that only one vector is cointegrated. The problem of Vector Autoregression will be solved using the Johansen test. Two test statistics, namely the trace (Tr) and the maximum eigenvalue (L-max) statistics, were proposed by Johansen (1988) and Johansen and Juselius (1990) to assess the number of cointegrating vectors or their rank. According to Cheung and Lai (1993), the Trace test demonstrates greater resilience to skewness and excess kurtosis in the residuals compared to the L-max test. However, both tests will be employed in this study.

3.1.4 Vector Error Correction Model (VECM)

The VCEM is utilised to analyse the long-term convergence of the economy toward equilibrium. Furthermore, the VCEM is employed in this study to examine the short-term association between variables. The following equation is the VAR equation:

$$\Delta Y_t = \sum_{i-1}^{p-1} \Gamma i \Delta Y_{t-i} + \Pi Y_{t-1} + \varepsilon_t$$

$Y_t$ represents a 2 X 1 vector consisting of FDI and Unemployment, while Δ is an operator that signifies a difference. It is a vector of residuals with dimensions 2 by 1. Through the estimated parameters, the VECM model is able to provide insights into the short-run relationship and long-run adjustment to changes in $Y_t$. When considering the error correction term $\Gamma i$ and $\Pi Y_{t-1}$, it is possible to factor Π into separate matrices $\alpha$ and $\beta$. Specifically, Π can be represented as $\Pi = \alpha\beta$, where $\beta$ represents the vector of cointegrating parameters and α represents the vector of error correction coefficients. It calculates the rate at which the system approaches its stable equilibrium over time. An accountant-like approach includes two tests in the Johansen-Juselius method: the trace test and the maximum eigenvalue test.

3.1.5 Diagnostic Test

It is compulsory to do a diagnostic test to ensure the data is free from any problems. This study will employ VEC Residual Heteroskedasticity Tests, Skewness, Kurtosis, Jarque Bera Test, and VEC Residual Serial Correlation LM Tests.

## 4.0 Results

### 4.1 Unit Root Test

To check whether the variables were stationary, we used the ADF test, which has been used a lot in previously conducted research. Table 1 displays the outcomes of the comparison between trend and non-trend data, as well as the findings of the level analysis. When the p-value falls below the significance limits of 0.01, 0.05, and 0.10, the null hypothesis is rejected in the ADF tests. If, on the other hand, the p-value is larger than the significance threshold, we accept the null hypothesis. The findings showed that for the FDI and unemployment variables, the null hypothesis (H0) could not be rejected at the 1% level of significance. At the 1% level, the variables are stationary and do not have any unit roots.

Table 1: The values of the Dickey-Fuller test for the used variables

| | Intercept | | Trend and intercept | |
|---|---|---|---|---|
| | Level | 1st Different | Level | 1st Different |
| FDI | -2.802376 * (0.0674) | -5.568621*** (0.0000) | -2.802376* (0.0674) | -5.546470*** ( 0.0003) |
| Unemp | -1.487979 (0.5288) | -3.743021*** (0.0073) | -1.848076 (0.6613) | -3.232352* (0.0943) |

Notes: 1. *, **, *** imply significance at the 10%, 5%, 1% level, respectively. 2. The numbers within parentheses for the ADF (Dickey-Fuller 1979) statistics represent the dependent variable's lag length used to obtain white noise residuals. 3. The lag length for the ADF was selected using the Akaike Information Criterion (AIC).

### 4.2 Lag Length Selection

Based on the Table 2, LR, FPE, AIC, and HQ show that the optimum lag is 3. However, SC shows that the optimum lag is 1. So, for this study, the optimum

lag that will be employed is three based on the AIC criteria.

Table 2: The optimal lag selection criteria

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -135.2522 | NA | 7.024446 | 7.625122 | 7.713095 | 7.655827 |
| 1 | -91.31243 | 80.55623 | 0.764347 | 5.406246 | **5.670166*** | 5.498361 |
| 2 | -87.62617 | 6.348556 | 0.779998 | 5.423676 | 5.863543 | 5.577201 |
| 3 | -79.18597 | **13.59811*** | **0.613408*** | **5.176998*** | 5.792811 | **5.391933*** |

Notes: Asterisk (*) shows the lag order that was selected by the criterion.

## 4.3 Cointegration Test

To investigate the long-term connection between the unemployment rate and the FDI, a cointegration test was conducted. A null hypothesis implies no long-term equilibrium relationship between the variables under consideration. On the other hand, a different theory proposes that these variables are related in the long run. We shall reject the null hypothesis if the critical value is less than the test statistic and accept it otherwise. A long-term equilibrium related between the chosen variables is suggested by rejecting the null hypothesis.

Table 3: Cointegration test

| Rank | Max-Eigen statistic | Critical value (eigen) at 5% | Trace statistic | Critical value (trace) at 5% |
|---|---|---|---|---|
| r*=0 | 21.67790*** | 14.26460 | 28.53729*** | 15.49471 |
| r<1 | 6.859387 | 3.841466 | 6.859387 | 3.841466 |

Notes: Asterisk (*), (**), and (***) indicate that the null hypothesis is rejected at the level of significance of 10%, 5%, and 1%, respectively.

The findings shown in Table 3 indicate that a long-term equilibrium association exists between unemployment and FDI, as evidenced by the maximum-Eigen statistic and trace statistic. The maximum eigenvalue of 21.67790 exceeds the critical value of 14.26460 at a one percent significance level. Similarly, the trace statistic value of 28.53729 surpasses the critical value of 15.49471 at a one percent significance level. The results obtained from the Max-Eigen and Trace statistics indicate the presence of a cointegrating vector.

## 4.4 Cointegrating Vectors

Based on the results of the cointegrating vectors for unemployment and FDI in Table 4, we can obtain the following cointegrating equation for Malaysia:

$$\text{Unemployment} = -1.267 \times \text{FDI}$$

Table 4: Cointegrating vectors

| One cointegrating equation | Log-likelihood | -73.56007 |
|---|---|---|
| UNEMP | FDI | |
| 1.000000 | -1.267687<br>(0.32506) | |

The cointegrating equation suggests that a 1% increase in Malaysian FDI leads to a corresponding increase of 1.27% in unemployment. The coefficient demonstrates statistical significance at a significance level of 1%. The findings indicate that the presence of unemployment in Malaysia has the potential to impact the long-term inflow of FDI positively. Ziberi and Avdiu (2020) have supported the notion that FDI can potentially lead to long-term unemployment. This scenario may occur when a company investing in a country exclusively manufactures a single product, and FDI leads to export substitution, resulting in a rise in unemployment within the home nation.

$$ECT_{t-1} = [1.000lnUnemp_{t-1} - 0.628158lnFDI_{t-1} - 1.581018]$$

## 4.5 VECM Model

$$\Delta lnUnemp_t = -0.131531ECT_{t-1} + 0.321399\Delta lnUnemp_{t-1} + 0.385145\Delta lnUnemp_{t-2} - 0.049046\Delta lnFDI_{t-1} - 0.051653\,\Delta lnUnemp_{t-2} - 0.028307$$

The rate of adjustment for the long-run equilibrium starting point from the previous year is 0.131 percent. Unemployment drops by 0.0490% for every 1% increase in FDI. There seems to be a temporary relationship between FDI and unemployment. Mazher et al. (2020) back this claim up by arguing that FDI may reduce unemployment and provide more job opportunities.

Table 5: Vector error correlation model (VECM)

| Vector error correlation model | Coefficient | Standard error | t-value |
|---|---|---|---|
| Cointegration | -0.131531** | (0.05070) | [-2.59448] |
| D(UNEMP(-1)) | 0.321399 | (0.16396) | [ 1.96027] |
| D(UNEMP(-2)) | 0.385145 | (0.16967) | [ 2.27003] |
| D(FDI(-1)) | - 0.049046** | (0.06039) | [-0.81215] |
| D(FDI(-2)) | 0.051653** | (0.05941) | [ 0.86939] |
| C | -0.028307** | (0.08784) | [-0.32224] |

A diagnostic assessment and stability test were performed to evaluate the efficacy of the VCEM. According to the results, there is no evidence of Heteroskedasticity as the p-value of 0.5448 exceeds the significance level of 0.05. Additionally, there is no evidence of autocorrelation for all variables, as the p-values for all lags are also above the significance level of 0.05. Furthermore, the data follows a normal distribution as indicated by the p-values of 0.6683 (Skewness), 0.4573 (Kurtosis), and 0.6679 (Jarque Bera Test), all of which are greater than the 0.05 level.

## 5.0 Conclusion

This study uses time series data from 1982 to 2020 for Malaysia to determine the potential cause and effect of the long-term and short-term relationship between FDI and joblessness. The cointegration test indicates a long-run relationship between FDI and unemployment in Malaysia. Moreover, the empirical result also shows that unemployment will eventually increase when more FDI inflows into the country. This result may be inconsistent with traditional research, where FDI inflows boost the economy and create more

job opportunities. However, this result based on Malaysian data may explain that the major FDI inflows are relatively higher in brownfield investments than in greenfield investments, such as the joint venture between Geely and Proton.

Brownfield investment focuses only on mergers and acquisitions from existing assets or capital, while greenfield investment is a new capital investment that consumes resources such as labor. FDI, which takes over the existing firm, may restructure the operation to ensure the firm can return to profit; hence, cutting employment is one option. Moreover, the statistics of FDI in Malaysia from 2016 to 2019 shows that services sector were the main contributor to FDI inflows compared to manufacturing (DOSM, 2022). The service sector may not demand as much employment as the manufacturing sector. Hence, the Malaysian government must revise its policies to focus more on attracting greenfield FDI inflows.

On the other hand, the Malaysian government should make compulsory compensation in terms of salary for the labourers laid off after the merger or acquisition. In addition, it is important to establish a strong partnership between the government and the private sector to provide comprehensive training initiatives specifically designed to meet the changing needs of various industries. It must place a high priority on the retraining of workers who have been laid off, providing them with industry-specific skills as well as entrepreneurial skills. Concurrently, governmental initiatives must prioritise the provision of incentives to educational institutions, encouraging their adoption of work-integrated learning models. This strategy not only strengthens the team of highly qualified workers in line with the needs of the industries (Alias, Adnan & Aun, 2023) but also promotes entrepreneurship (Bibi & Burhaumudin, 2022), therefore creating job chances for individuals and contributing to the general generation of jobs. FDI frequently changes labour dynamics, reducing the need for unskilled workers and requiring professional staff skilled in advanced technologies. Therefore, developing a skilled workforce that is well-versed in the most up-to-date technologies is crucial to meet various industries' changing demands.

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**Author Contributions**
**Kalai Vani, K.:** Data collection and analysis. She was pivotal in gathering and processing data; **Vinothiny, S.:** Introduction. She played an important role by identifying the gap and problem and briefly describing it in the introduction part. **Vikniswari, V. K.:** Supervised the research, provided guidance on the study design and methodology, and critically reviewed it. Her role is very important to complete this study successfully; **Sai, M. L.:** Literature Review. She reviews this study thoroughly by gathering many previous studies on this topic: **Foo, C. C.:** Interpretation result. He interpreted the result essential for this research; **Abdullah, M. B.:** Theory and edited the manuscript. He works

on theory and work on editing the entire manuscript.

**Conflicts Of Interest**

The manuscript has not been published elsewhere and is not being considered by other journals. All authors have approved the review, agree with its Submission and declare no conflict of interest in the manuscript.

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