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The Long Run and Causality Relationship Between Entry Modes of Foreign Direct Investment (Fdi) Towards Unemployment: Evidence in Developing and Developed Asian Countries

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ABSTRACT

This paper attempt to investigates the long-run relationship and causality relationship between entry mode of foreign direct investment (FDI) and unemployment for the period of 2006 until 2015 (10 years) in developing and developed Asian countries via panel unit roots, panel cointegration analysis and panel granger causality tests. In order to determine the order of integration variables, the panel unit root tests were carried out in this study. We employed Pedroni's panel cointegration test for long-run cointegration relationship and the panel Granger causality test has been employed to determine the causality relationship in this study. The results of the panel cointegration test shown that only developing Asian countries have a long-run relationship between entry modes and unemployment. While for the causality relationship test revealed a mixed finding where the brownfield investment does have granger cause on unemployment in developing Asian countries but for developed countries show the other around that unemployment granger cause on brownfield investment and slightly significant for causality relationship greenfield investment between unemployment. Additionally, the results also explicated that the inflow of foreign direct investments are attracted in both developing and developed Asian countries where there is the existence of an available workforce as shown in granger cause results. Thus, this study concludes that the entry modes of FDI; brownfield and greenfield investment are significant granger cause on unemployment and has a long-run

relationship in developing Asian countries compared to developed Asian countries.

INTRODUCTION

Foreign direct investments (FDI) have been used as one of the best alternatives by the government to boost economic growth, especially in developing countries. In this situation, classifying the main characteristics of foreign direct investment is one of the important for the foreign investors and also it has become a significant interest to the policymakers, the economists and also to the academic on examining the effect of foreign direct investment on the economic indicators. Bannock, Davis, and Baxter (1998), defined foreign direct investment as an investment that is made from the foreign investor by starting a new venture or buying a share in an existing company. This foreign direct investment consists of several entry modes, this study mainly focuses on these two entry modes which are Greenfield investments and Brownfield investment which also known as mergers and acquisitions (M&A).

According to Chang and Rosenzweig (2001), making a decision on choosing entry modes is important as each of the entry modes deliver specific consequences such as their benefits and risks. For instance, the acquisitions modes offer the fastest transaction but might face high risks with an overpayment, incapability in fully assessed on the value of acquired assets and post-acquisition challenges. Mergers modes attract the foreign investor on the local partner resources and to minimizing the risk but it will raise harsh issues in managing partner whose have to differ interest. Greenfield investment, on the other hand, offers the utmost control over the local partner but often time-consuming. Thus, Chang and Rosenzweig (2001) conclude that some of the host government imposed a policy that only certain entry modes of foreign direct investment are allowable to enter to the host countries.

LITERATURE REVIEW

Previous studies have shown that foreign direct investment has a negative and significant relationship towards unemployment. In Poland, a study was done by Balcerzak and Zurek (2011) in the period of 1995 – 2009 found a negative significant correlation between the FDI and unemployment when using Vector Autoregressive Systems (VAR) but there is a positive influence of FDI on the labour in short run only. However, the negative relationship among foreign direct and unemployment has not been fully accepted due to existence of contradicting results. A recent study done by Bayar and Sasmaz (2017), found a significantly positive long-run correlation between FDI and unemployment but negative relationship between domestic investments on unemployment in 21 emerging economies that consist of developing and developed countries over the period 1994 – 2014. Furthermore, Saray (2011) study the significant long-run relationship between foreign direct investment and employment 1970 until 2009 and found that foreign direct investment unable to reduce unemployment as it cannot create a job in long run.

Deciding an entry mode whether to choose brownfield investment which are acquisition and merging or greenfield investment which is venturing new business entity will be a critical discussion for every investors (Morschett, Schramm-Klein, & Swoboda, 2010) due to these entry modes commit to some resources to undergo, the investor had to select a long committed entry modes where the firm will face difficulty to change without face any loss of time and money (Root, 1987). On the other hand, when the foreign direct investment with the entry modes of acquisition of an enterprise is usually can have a minor or negative influence on the employment which means increases of unemployment (Hisarciklilar, Gultekin-Karakas, & Asici, 2014).

A study by Mucuk and Dermirsel (2013) mentions that brownfield investments have a positive impact on unemployment and at the same time will have an insignificantly negative direct impact on influencing the effect of the labour market in the host countries. Several studies separate the brownfield investment into two entities whereas cross border merger and acquisition and it presented mixed results. It was reported that during the acquisition, it has an increase in unemployment but will decrease unemployment during mergers (Lichtenberg & Siegel, 1992).

This study intends to investigate two objectives which are the long-run relationship and the causality relationship between both of the entry modes of FDI (greenfield investment and brownfield investment) including inflow of FDI and Domestic Investment (DI) towards unemployment in both of developing and developed Asian countries.

The remainder of this paper is organized as follows; Section 3 describes the data and methodology that being employed in this study. Section 4 presents the results of unit root, cointegration and causality relationship for both developing and developed Asian countries. The last section (Section 5) is the conclusion of this study.

DATA AND METHODOLOGY

Our sample consists of panel data for 15 developing Asian countries and 10 developed Asian countries over the period 2006 – 2015 (10 years). All data are gathered from World Bank Development Indicators and United Nations Conference on Trade and Development (UNCTAD, 2018). The unemployment rates (UN), Greenfield foreign direct investment in number of project in millions of dollars in US currency (GI), mergers and acquisitions by seller and by purchaser with the value of net cross-border in millions of dollars in US currency (BROW), net inflow of Foreign Direct Investment in percentage of gross domestic product (FDI), gross capital formation in percentage of GDP act as domestic investment (DI) are the economic indicators chosen by this study.

The independent variables consist of primary sources from types of investment which are GI, BROW, FDI and DI (the entry modes of foreign direct investment, the inflow of foreign direct investment and domestic investment).

Table 1 descriptive statistics of raw data for developing and developed Asian countries

Variables	Group of countries	Observation	Mean	Min	Max	Std. Dev.
UN	Developing	150	5.11212	0.16	13.075	3.22411
	Developed	100	3.89551	1.13	10.710	1.82886
BROW	Developing	150	6700.20	−5,2726.0	96024.6	15,584.9
	Developed	100	10857.10	−3,222.2	80458.8	16,701.3
GI	Developing	150	17,927.9	164.90	118907.00	25,128.3
	Developed	100	13,525.0	112.20	6920.79	20,478.6
FDI	Developing	150	5.04571	0.05669	43.9121	5.75770
	Developed	100	8.57761	0.00882	58.5188	11.3912
DI	Developing	150	26.8324	13.5487	48.4123	7.13162
	Developed	100	25.9210	12.3694	36.1408	6.40152

Table 1 presents the summary statistics of variables for developing and developed Asian countries and it presents the comparison the sources of types of investments and unemployment in developing and developed Asian countries. As seen in Table 1, the developed countries (3.90 per cent of the unemployment rate) shows better in utilizing with their labour sources compares to developing countries (5.11 per cent of the unemployment rate). It shows that developed Asian countries received more Brownfield investment (the highest amount, RM80,458.8 and the lowest amount RM−3,222.2) with the mean of 10,857.10 million compared to the developing Asian countries (the highest amount of RM96,024.6 and the lowest amount of RM−52,726.0) with the mean of 6700.20 million. Greenfield investment, on the other hand, shows that developing Asian countries received more with the mean of RM17,927.9 (the lowest amount RM164.90 and highest amount RM118,907) compared to developed countries with the mean of RM12,525.0 (the lowest amount RM112.20 and highest amount RM6,920.79). It can be seen that the inflow of foreign direct investment in developed Asian countries received more (8.57761 per cent) compared to developing Asian countries (5.04571 per cent). On the other hand, domestic investment shows that developing Asian countries (26.8324 per cent) generated better compared developed Asian countries (25.9210 per cent).

EMPIRICAL MODEL

The empirical model of this study follows the study of Hisarciklilar et al. (2014) and Bayar and Sasmaz (2017) which found contrast finding due to entry modes of FDI whereas GI and BROW. In order to investigate the long-run relationship and causality relationship between the entry modes of foreign direct investment on unemployment, the following two modes were used:

$$\lg UN_{it} = \beta 0 + \beta_1 \lg GI_{it} + \beta_2 \lg \mathrm{BROW}_{it} + \beta_3 \mathrm{FDI}_{it} + \beta_4 \mathrm{DI}_{it} + U_{it} \quad (1)$$

Where the *UN* is acting as the dependent variables, in the *i*, cross-section data for the countries referred to that period *t*. The independent variables are; GI, BROW, FDI and DI. The equation (1) is to check the significant relationship in the long run and the significant relationship for granger relationship.

This study employs some panel unit root tests to determine the integration order for these variables. We adopt the panel unit root tests that are widely being used by previous studies such as Levin, Lin, and Chu (2002), Im, Pesaran, and Shin (2003) and Breitung (2000). Pedroni (2004; 1999) proposed some tests that allow for heterogeneous intercepts and coefficient of the trend across the cross-sections in cointegration. Additionally, Pedroni (2004) also proposed seven tests of statistics for the panel cointegration that base on the Engle-Granger which is supported the basis of the two non-stationary methods that are cointegrated if some of the linear combinations are stationary. Thus, we employ Pedroni's test as it is comprehensive for the long-run relationship in developing Asian countries and developed Asian countries.

Furthermore, we employed a panel Granger causality test for our panel data for both developing and developed Asian countries by using lag 1 as proposed by Hurlin and Dumitrescu (2012) for the panel database. Hurlin and Dumitrescu (2012) proposed that the panel data can be used to test whether *x* causes *y* with the null hypothesis stated that does not granger-cause (no causality relationship) in order to detect the causality relationship in model regression.

EMPIRICAL RESULTS

Panel Unit Root Test

The analysis of this study begins with the transformation of the data into logarithmic (lg) in order to meet the assumptions of all the variables are in the normality. Then,

proceed with examination on the integration properties for each variable in each model equation. Table 2 and Table 3 show the panel unit root tests at the level for each developing and developed Asian countries.

As demonstrated in Table 2 and Table 3, most of the variables do not show unit root except for inflow of foreign direct investment (lgFDI), domestic investment (lgDI), exchange rate (lgEXR), money supply (lgM2) and inflation (lgINF) developing Asian countries. For the developed countries, only unemployment (lgUN), foreign direct investment (lgFDI), domestic investment (lgDI) and money supply (lgM2). The other variables are clearly shown stationary at levels as seen both of below tables.

Table 2 (a) Results of panel data unit root test for *developing and developed Asian countries* (level)

	Developing	Developed	Developing	Developed	Developing	Developed
Variables	LLC		Breitung		IPS	
lgUN	−5.7513*** (0.0000)	0.5948 (0.7240)	0.3524 (0.6377)	1.2883 (0.9012)	−1.6511*** (0.0494)	1.5919 (0.9443)
lgBROW	−7.1681*** (0.0000)	−2.5563*** (0.0053)	−2.8419*** (0.0022)	−2.7128*** (0.0033)	−3.2617*** (0.0006)	−3.4080*** (0.0003)
lgGI	−4.0558*** (0.0000)	−4.2808*** (0.0000)	−3.0980*** (0.0010)	−3.5536*** (0.0002)	−1.9055*** (0.0284)	−2.9670*** (0.0015)
lgFDI	−2.0192*** (0.0217)	−8.0716*** (0.0000)	−0.8953 (0.1853)	−1.0725 (0.1418)	−0.6347 (0.2628)	0.7105 (0.2387)
lgDI	−4.5842** (0.0845)	−7.5791*** (0.0000)	−0.4527 (0.3254)	−1.2404 (0.1074)	0.6061 (0.7278)	−0.4840 (0.3142)

Notes: The values in parentheses are the p-values. *, ** and *** are shows rejecting the null hypothesis of non-stationary at 10%, 5% and 1%, respectively.

The same panel unit root tests were transformed into first different to make it stationary as shown in Table 2 (a). As both results showed that all of these variables are stationary at first different in both developing and developed Asian countries. Hence, we conclude that the panel variables in this study are integrated of order one, *I* (1) as these first different variables are all stationary.

Table 2 (b). Results for panel data unit root test in *developing Asian countries* (first different)

	Developing	Developed	Developing	Developed	Developing	Developed
Variables	LLC		Breitung		IPS	
ΔlgUN	−10.4535*** (0.0000)	−7.7316*** (0.0000)	−4.5820*** (0.0000)	−3.4112*** (0.0000)	−4.3876*** (0.0000)	−2.5447*** (0.0055)
ΔlgBROW	−12.5135*** (0.0000)	−8.5381*** (0.0000)	−4.9229*** (0.0000)	−2.8588*** (0.0021)	−4.6682*** (0.0000)	−4.6048*** (0.0000)
ΔlgGI	−9.6594*** (0.0000)	−12.7352*** (0.0000)	−5.1530*** (0.0000)	−4.3952*** (0.0000)	−5.0377*** (0.0004)	−3.9895*** (0.0000)
ΔlgFDI	−5.5605*** (0.0000)	−18.1626*** (0.0000)	−4.0911*** (0.0000)	−3.6251*** (0.0000)	−4.0099*** (0.0000)	−2.3909*** (0.0084)
ΔlgDI	−5.6991*** (0.0000)	−7.4419*** (0.0000)	−2.7408*** (0.0031)	−3.2418*** (0.0006)	−3.2390*** (0.0006)	−2.0735*** (0.0191)

Notes: The values in parentheses are the p-values. *, ** and *** are shows rejecting the null hypothesis of non-stationary at 10%, 5% and 1%, respectively.

Panel Cointegration Analysis

As results show that all panel variables are found to be integrated in order one *I* (1), thus, we can proceed with the panel cointegration test using these first different variables to examine the long-run relationship between the entry modes of foreign direct investment, inflow of foreign direct investment, domestic investment and unemployment using the equation 1. The test reveals mixed results for both developing and developed Asian countries.

Table 3 Summary of the results of the long-run relationship using panel cointegration test (Pedroni Test) in developing and developed Asian countries

Within-dimension	*Developed Asian Countries*	*Developing Asian Countries*
Panel v-Statistic	−2.421050	−2.036472
Panel rho-Statistic	3.102370	2.831444
Panel PP-Statistic	1.116393	−7.843315***
Panel ADF-Statistic	2.914590	1.338986
Between-dimension		
Group rho-Statistic	6.789789	4.762024
Group PP-Statistic	−6.439742***	−9.654930***
Group ADF-Statistic	5.110501	4.716045

Notes: All values are presented asymptotically distributed as standard normal. Lag length (1) is computed by Newey-West bandwidth selection and Bartlett kernel. ***, ** and * indicates rejecting the null hypothesis of no cointegration at 1%, 5% and 10% level, respectively.

Table 3 shows that the developed Asian countries are failed to reject the null hypothesis and it depicts that there is no cointegration within the dimension based on the result of Panel PP-Statistic. Yet, the results statistics suggested there is a presence of strong cointegration relationship in the developing Asian countries within the dimension based on Panel PP-Statistic. From the results of the between the dimensions, it shows that there is cointegration relationship in developing Asian countries and developed Asian countries based on Group PP-Statistic.

Therefore, we conclude that there is cointegration (long-run relationship) in the developing Asian countries among the both of the entry modes of foreign direct investment (Greenfield investment and Brownfield investment), inflow of foreign direct investment (FDI) and domestic investment (DI) on unemployment (UN).

Panel Granger Causality

We employed the Granger causality using the equation (1) to determine causality relationship between the entry modes of foreign direct investment (greenfield investment and brownfield investment), inflow of foreign direct investment (FDI) and unemployment as shown in Table 4.

Table 4 Summary of the results of panel Granger causality using Dumitrescu and Hurlin's Granger non-causality test

Group countries	Hypothesis	z-bar	z-bar tilde
Developing Countries	FDI does Granger-cause UN	3.1701***	0.7593
	GI does Granger-cause UN	1.3852	0.0066
	BROW does Granger-cause UN	1.6525*	0.1194
	DI does Granger-cause UN	3.0575***	0.7118
	UN does Granger-cause FDI	0.9559	−0.1743
	UN does Granger-cause BROW	1.2986	−0.0298
	UN does Granger-cause GI	0.4131	−0.4032
	UN does Granger-cause DI	0.9481	−0.1776
Developed Countries	FDI does Granger-cause UN	2.7435***	0.6854
	GI does Granger-cause UN	−1.7452*	−1.2073
	BROW does Granger-cause UN	−0.1414	−0.5310
	DI does Granger-cause UN	0.2618	−0.3610
	UN does Granger-cause FDI	−0.3863	−0.6343
	UN does Granger-cause BROW	3.7666***	1.1167
	UN does Granger-cause GI	0.5331	−0.2466
	UN does Granger-cause DI	3.2990***	0.9196

Notes: The superscripts ***, **, and * presented the significant at 0.01, 0.05, and 0.1 level, indicating that rejecting the null hypothesis.

Based on Table 4, the results for both of the developing and developed Asian countries are found to be highly significant where foreign direct investment does granger cause unemployment. This finding consistent with a study by Strat, Alexandru, and Vass (2015) where they mention that the foreign direct investment is attracted with the availability of workforce in the host countries. As for domestic investment, in developing Asian countries, domestic investment is attracted to higher unemployment. The results for developed Asian countries shown that the higher the unemployment the higher will be the domestic investment where developed countries mostly become the FDI giver thus developed countries used local investor to create job opportunities.

For the entry modes of foreign direct investment, on the other hand, show that Brownfield investment mode is attracted to the unemployment rate in developing Asia countries but with low significant level. For the developed Asian countries show that the Greenfield investment is attracted to the unemployment rate with a low significance level.

Nonetheless, the results show that the unemployment rate proved to have a causal influence on the inflow of brownfield investment in developed Asian countries with high significant level. These results show that the higher the unemployment rate will cause higher Brownfield investment to enter the developed Asian countries.

Therefore, we conclude that the entry modes variables do have cause influence on unemployment in both of the developing and developed Asian countries.

CONCLUSION

To conclude, this study examines the impact of the entry modes of foreign direct investment (Greenfield investment and Brownfield investment) including the inflow of foreign direct investment and domestic investment on unemployment in the long-run for developing and developed Asian countries. Also, the causality relationship between both of the entry mode of foreign direct investment (Greenfield investment and Brownfield investment), inflow of foreign direct

investment and unemployment in developing and developed Asian countries.

The main aiming of this study is to examine the long-run relationship and causality relationship among those variables in developing and developed Asian countries for the period of 2006 until 2015 (10 years). This study used the static panel data analysis, panel cointegration test (Pedroni Test) and panel Granger causality relationship.

The results based on Pedroni cointegration test show that there is an inconsistent long-run cointegration relationship between the types of investment (the entry modes of foreign direct investment, the inflow of foreign direct investment and domestic investment) and unemployment. Therefore, we conclude in the developing Asian countries only, there is cointegration among the both of the entry modes of foreign direct investment (Greenfield investment and Brownfield investment), inflow of foreign direct investment and domestic investment on unemployment.

The first important finding of this paper consists that the fact there is a causality relationship between inflow of foreign direct investment towards unemployment in both developing and developed Asian countries. Therefore, the government should be careful when implementing the policy related to the FDI with the aiming of reducing unemployment.

The second finding of the study is presented the knowing the causality relation between the entry modes and inflow of foreign direct investment. For the case of developed Asian countries, it has been found that greenfield investment causes unemployment and at the same time the unemployment cause the brownfield investment. It can be seen that the results show both entry mode cause unemployment in developed Asian countries. Higher unemployment causes higher both of the entry modes to enter into the developed Asian countries. Developing Asian countries, on the other hand, has shown that only brownfield investment is attracted to the high unemployment rate. This proved that foreign investors invest in the form of brownfield investment or brownfield investment search host countries with the availability of labour sources.

Thus, the findings in this paper suggest that there is a significant impact between the entry modes and unemployment in the long-run relationship for developing Asian countries but short-run in developed Asian countries only. Additionally, this study concludes that the governments should imply policies to attract foreign investors to invest in form of greenfield investment or brownfield investment to invest in order to reduce the unemployment even in the long term especially developing Asian countries.

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