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We Bring You Capital and Job – Foreign Investment and Employment in Malaysia

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Abstract: Research Question: Do foreign investment inflows bring jobs for a small open economy, Malaysia? **Motivation:** Past studies have employed aggregate FDI and employment data, but their findings are subjected to aggregation bias. This 'puzzle' is resolved by employing disaggregated data. This study is built on the basis of Wong and Tang (2011), Hale and Xu (2016), and Jude and Silaghi (2016). This study explores the impact of foreign investment inflows on jobs creation for 19 industries. It offers a better understanding either foreign investment inflows create jobs or not in the host country. It is important because foreign investment has been strategized long ago by Malaysia for economic growth. The findings are relevant for policymakers. **Idea:** The core idea is that foreign investment inflows into different industries in Malaysia may have different impact on jobs creation. **Data:** Foreign investment inflows and employment data are obtained from Malaysian Investment Development Authority (MIDA) covering annual observations between 1980 and 2016. Other variables are human capital, population, and real Gross Domestic Product acting as control variables. **Method/Tools:** This study considers cross-sectional (ordinary least square, OLS) equation for its respective year between 1980 and 2016. And, time-series autoregressive-distributed lag (ARDL) approach for the 19 industries, respectively. **Findings:** Of the estimated cross-sectional equations, foreign investment has a positive effect on employment, in which the largest effect is in the year of 1995 (0.85). The ARDL results show that foreign investment inflows and employment are cointegrated for the 19 industries. Their long-run elasticity of foreign investment on employment are statistically significant, expect for Textiles & Textile Products (TTP), Paper, Printing & Publishing (PPP), and Petroleum Products (including Petrochemicals) (PetP) industries. They have a positive sign as expected (i.e. foreign investment creates jobs), except for Leather & Leather Products (LLP), and Non-Metallic Mineral Products (NMMP) industries. **Contributions:** This study adds fresh findings to the research literature on effect of foreign investment inflows on employment in Malaysia, in general, and her 19 industries. It sheds an insight for policy implication, especially for both financial market and labour market.

Keywords: Employment, foreign direct investment inflow, industry, Malaysia
JEL classifications: F21, J21

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1. Introduction

In an era of financial globalization (financial liberalization), capital inflow is being considered as a main '*transactor'* recorded in the financial account of a country's balance of payments (BoP), which about all financial transactions, or changes in international ownership of assets such as *direct investments*, securities (stocks and bonds) and commodities (gold and hard currency). Undoubtedly, foreign direct investment (FDI, henceafter) has been considered as an important topic by economists, as well as for policymakers because of its contribution in promoting the host country's economic growth. According to Sjöholm (2014), multinational firms manage to attract inflow of FDI in Southeast Asia in rising economic growth over the past decades. Indeed, the multinational enterprises [FDI] are not only bring capital in, but also create more jobs for the host country by means of establishment of local manufacturing plant, or acquisition of a local firm.

This study aims to examine the [long-run] impact of foreign investment inflow on employment for a small open economy, Malaysia. In contrary to the past studies (Yusof, 2010; Bekhet and Mugableh, 2016; Irpan *et al.*, 2016) of using aggregate data, this study employs disaggregated data of 19 industries for the period 1980-2016 (annual data). Foreign investment has been acknowledged as a crucial and inescapable part of the Malaysian economy. Malaysia as an active participant in global trade has been very successful in attracting FDI even when the country was at its infancy (Mohamed, 2017). In fact, Singapore was the top source of FDI in Malaysia followed by Netherlands, Japan, the U.S and Hong Kong, while China was only the sixth largest foreign investor contributing 7.1% of total FDI to Malaysia (Ridzwan, 2018). Foreign investment adds various benefits to the process of a country's economic development, in particularly for the developing countries via. entrepreneurial, stable capital inflows, highly-paying jobs, transfer of technology and workplace skills, and strengthening the global business. Foreign investment inflows can be traced to domestic political developments in Singapore and Malaysia because of stability and geography of these countries that more foreign firms have entered by expanding production, and by introducing new technologies. They have also benefited broad segments of the populations by providing modern sector employment and relatively high wages (Sjöholm, 2013). According to Dogan *et al.* (2017), Malaysia is aiming to transforms the nation into a high-income stage by attracting more FDI given that Malaysia's economy is currently in a phase of technology and skills upgrading. As reported by the Malaysian Investment Development Authority (MIDA), investment in the manufacturing, services and primary sectors involved 3,886 projects, and would have a capacity to create 91,500 jobs. Also, 464 manufacturing projects worth RM35 billion were approved in January-September of 2017, of which about a third was oil and gas-related and has the capacity to create more than 32,700 jobs (*RM113.5bil in investments approved*, 2017).

Topic on the association between FDI and employment has been largely studied. Hale and Xu's (2016) study has reviewed 30 empirical studies published between 1995 and 2015 on the effect of foreign investment on labor market of the host country with four concerns, namely employment, wage, productivity and inequality. The reviewed past studies are inconclusive (i.e. either positive or negative) on the effects of foreign investment on employment. Most of those studies (19 cases) support a positive significant coefficient of FDI on employment, while only 5 cases for a negative coefficient, for developing countries. However, opposite observation holds for advanced countries that negative coefficient is 15 cases which is slightly more than the positive coefficient (13 cases).[1] A summary of other past

[1] As stated in Hale and Xu (2016, p.3) on the summary of the empirical results in the literature: Effects of FDI on labor market outcomes.

Employment	Advanced: 42/ 13/ 15	Developing: 32/ 19/ 5

Number of studies/ Number of positive significant coefficients/ Numbers of negative significant coefficients.

studies are tabulated by Jude and Silaghi (2016, pp. 34-35) for further reference. Indeed, an obvious feature reflected by the current studies is that they employ different testing methods to estimate the association between FDI and employment (Wong and Tang, 2011; Jude and Silaghi, 2016; Colak and Alakbarov, 2017; Rozen-Bakher, 2017).

Let look at a case study of Malaysia that FDI is believed to have a positive impact on employment as a developing country that notified in a survey study by Hale and Xu (2016). Unfortunately, only three studies are found from the literature search. Yusof (2010) finds that globalization does not affect much on the labor variables, but inflows of foreign investment which interacts with productivity and output growth for the period 1989- 2006. More lately, Bekhet and Mugableh (2016) document that the Malaysian employment (for all sectors) and inward foreign investment are cointegrated for the period 1972-2012. Also, a causality is found from inward foreign investment to employment in manufacturing sector, but from employment in construction sector to inward foreign investment. Irpan *et al.* (2016) also confirms that FDI, number of foreign workers and GDP significantly explain the unemployment rate in Malaysia by using macroeconomic data for the period 1980-2012. Surprisingly, these findings are heavily based on the empirical results of aggregate data on foreign investment and employment, that a positive impact of foreign investment on employment is supported. Perhaps, empirical finding(s) of using disaggregated data, especially at industry levels remains vacuum in the literature for Malaysia. Hence, this study is relatively considered new and important, in particular to shed insight on policy implication i.e. to formulate favorable policies in order to attract more inflows of capita into the country in which with jobs are expected to be created.

The structure of this study is organized as follows. Section 2 is about conceptual framework, data and testing method used in this study. The empirical results are presented in Section 3. Section 4 concludes this study.

2. Conceptual Framework, Data and Testing Method

This section briefly describes a conceptual framework that explains the possible impact of foreign investment inflows on employment, mainly as based on Jude and Silaghi (2016). According them (Jude and Silaghi, 2016), foreign investors play a crucial role in the host country for jobs creation in several channels. The first is, the so-called greenfield investment which is expected to have high potential for creating more job opportunities, in particularly the labour-intensive sectors. The immediate effects of such investment on employment seem to be negligible for the cases of merger and acquisition. Secondly, FDI inflow is eventually assumed, to a large extent will be a bad impression towards employment due to higher efficiency in the use of labour. Indeed, multinationals are thought to possess certain intangible firm i.e. 'specific assets' which are productivity enhancing. In this relation, more productive firms would create less employment than local firms. The third channel, is through competition effect and productivity spillovers that FDI can influence the labour demand of domestic firms. If competition crowds out domestic firms at FDI entry, labour intensity of receiving industries might be negatively affected. The last channel is that local linkages can lead to productivity spillovers for domestic firms and job creation i.e. the spillovers in the upstream sectors are generally positive, while spillovers in the downstream sectors will be negative (Jude and Silaghi, 2016, pp. 32-49). By and large, an *analytical* framework on the causality (i.e. that is to examine *which came first, chicken or egg?*) between employment and foreign direct investment is described by Wong and Tang (2011, pp. 317-8) for additional insight. This study looks at the impact of FDI on employment, instead of their causality pattern(s).

This study employs an *ad hoc* employment model that relates employment *directly* to foreign investment inflows. Foreign investment creates jobs - that a positive impact of FDI on employment is expected; but opposite may be the case if foreign investment comes and reduces jobs (see, Hale and Xu, 2016, p.3-4). Three control variables are included, namely human capital, population and real GDP those have important implication on employment. These variables have been conventionally employed by the past studies as macroeconomic determinants of employment. Also, their selection is basically due to the data availability, and for simplicity reason (i.e. to avoid *over-parameterization* problem).[2] Human capital is about knowledge, skill and motivation, in which it provide economic value (Simon, 1998, p. 223; Jude and Silaghi, 2016), and higher economic growth (as proxied by real GDP) creates employment opportunity (Burggraeve, *et al.*, 2015). Population growth, however, may reduce employment due to surplus in labour market given a full employment assumption holds (Sweezy and Owens, 1974).

Table 1: The variables

Variable	Unit of measurement	Source
Employment, *ln*EM[1]	Number of employment created by the approved manufacturing projects.	Malaysian Investment Development Authority (MIDA).
Real Foreign Investment, *ln*FI[1]	Approved amount by MIDA (in RM). Nominal value is deflated by CPI (2010=100).	As above.
<u>Control variables</u> [2]		
Index of Human Capital per Person, *ln*HC	Index of human capital per person, based on years of schooling and returns to education.	Federal Reserve Economic Data, https://fred.stlouisfed.org/series/HCIYISMYA066NRUG
Population, *ln*POP	Total population is based on the *de facto* definition of population, which counts all residents regardless of legal status or citizenship.	World Development Indicators, World Bank. https://databank.worldbank.org/data/
Real GDP (Gross Domestic Product), *ln*Y	GDP is the sum of gross value added by all resident producers in the economy, which is measured in constant local currency. Consumer Price Index (2010=100) is used as deflator.	As above.

Notes: [1] These variables are disaggregated data of 19 industries, namely Food Manufacturing (FM), Beverages and Tobacco (BT), Textiles and Textile Products (TTP), Leather and Leather Products (LLP), Wood and Wood Products (WWP), Furniture and Fixtures (FF), Paper,Printing and Publishing (PPP), Chemical and Chemical Products (CCP), Petroleum Products (including Petrochemicals) (PetP), Rubber Products (RP), Plastic Products (PP), Non-Metallic Mineral Products (NMMP), Basic Metal Products (BMP), Fabricated Metal Products (FMP), Machinery and Equipment (ME), Electronics and Electrical Products (EEP), Transport Equipment (TE), Scientific and Measuring Equipment (SME) and Miscellaneous (MISC). For the foreign investment, a constant value of 1000 is added because of zero value for some periods.
[2] The three control variables are macroeconomic data (i.e. time series data at aggregate levels).

Table 1 describes the underlying variables and their data source. Table 2 reports the key summary statistics (mean, median and standard deviation) of the 19 industries over the sample period 1980-2016 with 37 annual observations. It is interesting to be observed that Leather and Leather Products (LLP) industry has the lowest average values (median) of employment

[2] By and large, this study does not consider GDP per capita as an explanatory variable, but to use a variable for GDP, and another for population as described above, because GDP per capita is conventionally accepted to measure standard of living, which is not a feasible explanatory variable to explain employment creation in a country. And, it is to note that this study focuses on the impact of FDI on employment, instead of other control variables underlie.

Table 2: Summary statistics

	Employment, *ln*EM			Real Foreign Investment, *ln*FI		
Industry	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
FM	8.334	8.324	0.451	19.925	20.055	0.933
BT	5.638	5.924	1.051	16.115	16.990	3.392
TTP	8.277	8.429	1.006	19.304	19.561	1.354
LLP	5.181	5.268	1.260	13.813	14.262	3.151
WWP	8.519	8.350	0.799	18.916	19.081	1.259
FF	7.957	8.409	0.952	17.519	17.931	1.257
PPP	7.438	7.550	0.590	19.047	19.181	1.427
CCP	7.777	7.851	0.443	20.636	20.720	1.270
PetP	6.352	6.258	0.788	20.066	20.966	3.121
RP	8.205	8.110	0.747	19.042	18.728	0.989
PP	8.036	8.143	0.506	19.192	19.397	1.166
NMMP	7.926	8.008	0.566	20.116	20.217	1.152
BMP	7.976	8.018	0.654	20.634	20.570	1.456
FMP	8.231	8.316	0.556	19.554	19.959	1.218
ME	8.094	8.267	0.631	19.419	19.707	1.249
EEP	10.111	10.142	0.632	21.938	22.296	1.404
TE	8.406	8.426	0.631	19.636	19.737	1.286
SME	6.725	7.002	1.272	18.208	18.009	1.866
MISC	7.027	6.878	0.736	17.299	17.471	1.788

(*ln*EM), 5.27 which is associated with the lowest real foreign investment (*ln*FI), 14.26. Similarly, the highest averages of both employment (10.14) and foreign investment (22.3) are observed for Electronics and Electrical Products (EEP) industry. It offers a basic understanding that a positive correlation holds between employment and foreign investment for a small open economy, Malaysia.

For baseline analysis, a cross-sectional employment [simple] regression equation (1) is feasible to be estimated by OLS (ordinary least square) estimator for the cross-sectional data of 19 industries between the respective years of 1980 and 2016.

$$ln\text{EM}_i = \beta_0 + \beta_1 ln\text{FI}_i + e_t \tag{1}$$

where EM is employment, FI is real foreign investment, *ln* is natural logarithm transformation, and *i* is the 19 industries those are named in as note [1] in Table 1. Meanwhile, equation (2) represent a [multiple] time series regression equation which is the core equation to be estimated in this study covering 37 yearly observations between the years of 1980 and 2016 for 19 industries, respectively.

$$ln\text{EM}_t = \beta_0 + \beta_1 ln\text{FI}_t + \beta i\mathbf{X}_t + e_t \tag{2}$$

to add that where **X** represent a matric of the three basic control variables in explaining employment, namely index of human capital per person, (HC), population (POP) and real GDP (Y) as described in Table 1. More precisely, equation (2) is a long-run (level) relation which reflects the long-run impact (i.e. elasticity) of foreign investment (β_1) on employment by each of the 19 industries in Malaysia, as well as the three control variables (**X**), β_i.

With the past decades of practice in time series data analysis, this study employs a *conventional* testing and estimation procedure which has been proposed by Pesaran *et al.* (2001) that is ARDL (autoregressive-distributed lag) approach for equation (2). Conversely, it is to note that OLS regression of using nonstationary, let say *I*(1) time series variables can be *spurious* i.e. invalid their estimated coefficients if no long-run relation (no cointegration) is suggested by the respective testing approach (see, Engle and Granger, 1987). According to Engle and Granger (1987), a linear combination of two or more nonstationary series may be stationary, $I(0)$ that a cointegrating relation does exist. Hence, the OLS regression is not a *"spurious regression*." This study takes this concern into consideration for the time series data of 19 industries over the period 1980-2016. The ARDL procedure can be applied irrespective of the regressors are $I(0)$ or $I(1)$, and this avoids the pre-testing problems associated with standard cointegration analysis (see, Engle and Granger, 1987; Johansen and Juselius, 1990) which requires the classification of the variables into $I(1)$ and $I(0)$.[3] In brief, the ARDL procedure is based on the estimation of an error-correction version of ARDL specification as showed in equation (3) which is derived from the employment relation (equation 2).

$$\begin{aligned}\Delta lnEM_t = c &+ \sum_{i=1}^{n} \beta_{1i}\Delta\, lnEM_{t-i} + \sum_{i=0}^{n} \beta_{2i}\Delta\, lnFI_{t-i} + \sum_{i=0}^{n} \beta_{3i}\Delta\, lnHC_{t-i} \\ &+ \sum_{i=0}^{n} \beta_{4i}\Delta\, lnPOP_{t-i} + \sum_{i=0}^{n} \beta_{5i}\Delta\, lnY_{t-i} + \gamma_0 lnEM_{t-1} \\ &+ \gamma_1 lnFI_{t-1} + \gamma_2 lnHC_{t-1} + \gamma_3 lnPOP_{t-1} + \gamma_4 lnY_{t-1} + u_t\end{aligned} \tag{3}$$

Also, equation (3) takes into account the three major crises occurred in Malaysia during the post-independence era, by introducing the following zero-one dummy variables: i) *Dummy_1985-1986*, to capture the 'commodity shock' in the mid-1980s), ii) *Dummy_1997-1998*, for the Asian financial crisis between 1997 and 1998, and iii) *Dummy_2008-2009* reflects the global financial crisis of 2008. They are expected to have a negative implication on employment growth. A value of one for the years with the respective crisis occurs, otherwise zero (0). For instance, *Dummy_1985-1986*, one is assigned for the years 1985 and 1986, other years are zero. A level (long-run) relation among the underlying variables can be written as $ln\mathrm{EM}_t$ -$ln\mathrm{FI}_t$ -$ln\mathrm{HC}_t$ -$ln\mathrm{POP}_t$ -$ln\mathrm{Y}_t$ in which it can be tested their long-run relationship or "cointegratedness' by testing the null hypothesis $H_0{:}\gamma_0 = \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = 0$ (i.e. no level relationship), against the alternative hypothesis $H_1{:}\gamma_0 \neq 0,\ \gamma_1 \neq 0,\ \gamma_2 \neq 0,\ \gamma_3 \neq \gamma_4 \neq 0$ (i.e. a level relationship) with a usual F-test, bounds test. The statistical inference of bounds test is as that, if the computed F-statistic exceeds the upper bound of the critical value band $I(1)$ as in the tables – Critical values for the bounds test from Narayan (2005, pp. 1987-1990), the null hypothesis can be rejected at a conventional level of significant (i.e. 1%, 5%, or 10%), and the underlying variables are said to be cointegrated or a long-run relation does exist. If the computed F-statistic falls below the lower bound of the critical value band $I(0)$, the null hypothesis cannot be rejected, hence no cointegration among the variables (i.e. no level relationship) can be delivered. In the case that the computed F-statistic is between the critical value band $I(0)$ and $I(1)$, conclusive finding cannot be made, and it is a requirement to run a unit root tests in order to determine the degree of integration $I(d)$ among the variables are either $I(0)$ or $I(1)$, but not all $I(0)$ or all $I(1)$, and none of $I(2)$ regressor(s). Once cointegration is established, the long-run coefficient (elasticity) of foreign investment variable ($lnFI_t$) for instance, can be calculated as -(γ_1/γ_0) (Pesaran *et al.*, 2001, p. 294), while its short-run coefficients are the OLS estimated β_{2i} of $\Delta lnFI_{t-i}$, (i.e. variable at first-differenced) with their respective lags.

[3] Also, see Jenkinson (1986) for an early cointegration technique which is identical to ARDL framework or unrestricted error-correction model, but different sets of critical values applied.

3. Empirical Results

First of all, this section tells about the empirical finding(s) of equation (1) that consist of 37 estimated cross-sectional regression equations (i.e. the respective years between 1980 and 2016) based on 19 observations (industries) each. The estimated coefficients of foreign investment (lnFI$_i$), β_1 are graphically illustrated in Figure 1, while their OLS estimates are reported in Appendix A. It shows that the impact of foreign investment inflows on the Malaysian employment are in a positive sign ranging between 0.034 (in 1983) and 0.853 (in 1995). Interestingly, Figure 1 shows two 'peaks' those occurred in the year of 1995 (0.853) and 2001 (0.771) indicating foreign investment inflows on the 19 industries with more jobs have been created. Indeed, three 'deep troughs' have been observed for the year of 1983 (0.034), 1999 (0.121) and 2009 (0.239) those are identified around the three crises experienced in Malaysia. The 'trough' that occurs in 1983 may be a signal of the economic recession in 1985-1986. Other two 'troughs' (1999 and 2009) are clearly explained by the latest two crisis episodes, namely the 1997-1998 Asian financial crisis, and 2008-2009 global financial crisis. By the same token, these observations may reflect structural changes in manufacturing sectors experienced in Malaysia over the period 1980-2016. It can be partially explained by industry transformation (innovation) from labour-intensive to capital-intensive production after 2001 that requires less labour inputs. Also, it explains a change in the structure of labour market in Malaysia – from traditional manufactory sector to services sector, and from domestic workers to immigrant workers that employment becomes less response (i.e. more expensive the labour costs endure) to the inflows of foreign capital for the 19 industries.

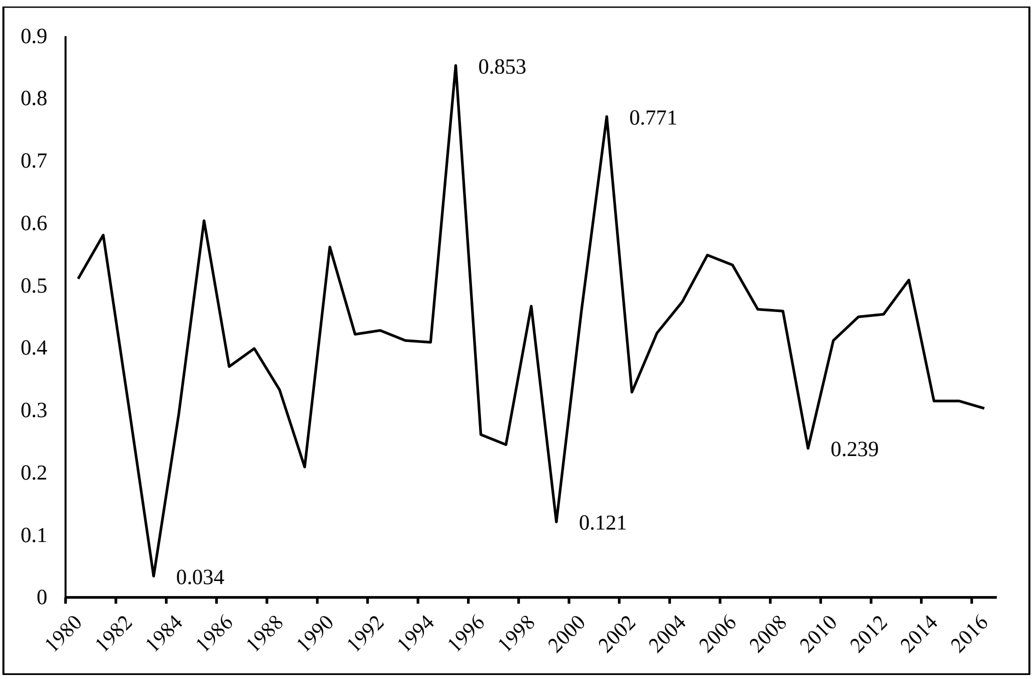

Figure 1: The estimated coefficient of lnFI$_i$ on lnEM$_i$, regression equation (1) of 19 industries between 1980 and 2016

Let look at the estimates of equation (2) for each 19 industries based on 37 yearly observations (1980-2016). Table 3 reports the F-statistics of ARDL bound tests (by estimating equation 3) for the 19 industries individually in order to determine the existence

Table 3: ARDL *F*-statistics bound test for cointegration

Industry		F (*ln*EM | *ln*FI, *ln*HC, *ln*POP, lnY) ARDL(.)	*F*-statistic
FM	Food Manufacturing	ARDL(3, 3, 1, 3, 3)	20.078***
BT	Beverages and Tobacco	ARDL(2, 1, 0, 1, 0)	9.454***
TTP	Textiles and Textile Products	ARDL(1, 3, 1, 1, 1)	7.656***
LLP	Leather and Leather Products	ARDL(1, 3, 2, 3, 3)	19.884***
WWP	Wood and Wood Products	ARDL(2, 2, 3, 2, 3)	16.269***
FF	Furniture and Fixtures	ARDL(3, 3, 0, 3, 2)	3.545**
PPP	Paper, Printing and Publishing	ARDL(3, 3, 3, 3, 3)	6.065***
CCP	Chemical and Chemical Products	ARDL(2, 0, 3, 0, 3)	15.221***
PetP	Petroleum Products	ARDL(3, 1, 1, 3, 2)	13.842***
RP	Rubber Products	ARDL(2, 1, 1, 3, 0)	9.017***
PP	Plastic Products	ARDL(3, 2, 1, 3, 2)	6.250***
NMMP	Non-Metallic Mineral Products	ARDL(3, 3, 3, 3, 3)	15.042***
BMP	Basic Metal Products	ARDL(3, 3, 3, 3, 3)	8.255***
FMP	Fabricated Metal Products	ARDL(1, 1, 2, 3, 3)	8.925***
ME	Machinery and Equipment	ARDL(3, 0, 0, 3, 1)	30.521***
EEP	Electronics and Electrical Products	ARDL(3, 0, 1, 3, 1)	26.090***
TE	Transport Equipment	ARDL(1, 0, 1, 3, 3)	18.579***
SME	Scientific and Measuring Equipment	ARDL(3, 3, 3, 2, 0)	2.715*
MISC	Miscellaneous	ARDL(1, 1, 1, 3, 3)	6.653***
Critical values (*k*=4, *n*=35)		Lower bound, I(0)	Upper bound, I(1)
10%*		2.969	3.898
5%**		3.276	4.630
1%***		4.590	6.368

Notes: The lag structure of ARDL(.) is suggested by AIC (Akaike information criterion) of a maximum lag length of 3, which is based on Enders's (2014) rule that $T^{1/3}$, where T is the number of observations, i.e. 37^1/3 = 3. The underlying null hypothesis is 'no levels relationship'. The reported critical values are from Narayan (2005, p. 1988) with k is the number of regressors, and n is sample size for Case III unrestricted intercept and no trend.

of a long-run relation between employment (dependent variable) and foreign investment with a set of control variables, namely human capital, population and real GDP. All of the computed *F*-statistics are large enough that is above the *I*(1) critical bands at least 10% level, thus a long-run relation among the underlying variables can be concluded. For the food manufacturing industry (FM), for example, its computed *F*-statistic, 20.078 lies above the 1% upper band *I*(1) critical value, 6.368, that the null hypothesis of no levels relationship (no cointegration) can be rejected. It is to say that employment, foreign investment (inflows), index of human capital, population and real GDP (*ln*HC) are cointegrated or moving together in the long-run. Hence, the OLS estimates of equation (2) for this [FM] industry is valid - *not spurious!* It is the case for all other industries.

Table 4 reports the estimated long-run relation of employment equation (2) for the 19 industries since the underlying variables are cointegrated. The estimated coefficients, more precisely their elasticity of real foreign investment are statistically significant at least, 10% level, expect for three industries, namely Textiles and Textile Products (TTP), Paper, Printing and Publishing (PPP), and Petroleum Products (PetP). The long-run elasticities of real foreign investment on employment, in their absolute values are ranging between 0.12 (Beverages and Tobacco, BT) and 0.81 (Wood and Wood Products, WWP). It is interesting to inform that both the Leather and Leather Products (LLP), and Non-Metallic Mineral Products (NMMP) industries are in a negative sign, -0.52 and -0.20, respectively, which is contrary to the conventional expectation that foreign investment creates employment. This finding also suggests that both industries are more capital-intensive in their production, in which FDI reduces the demand for labour. This study adds to the previous studies with findings from using disaggregated data of 19 industries that foreign investors bring in their capital and create more jobs, in particularly the 19 industries as mentioned. Of the three control variables, in brief, human capital remains an important factor in determining the employment in Malaysia than of others (real GDP and population) with 10, 6 and 4 industries are statistically significant at least 10% level for these control variables, respectively.

Table 4: Long-run estimates (a level relation) of equation (2), dependent variable: $lnEM_t$

Regressors	$lnFI_t$	$lnHC_t$	$lnPOP_t$	lnY_t
Industry				
FM	0.803 (0.000) ***	15.739 (0.029) **	-5.709 (0.279)	-3.217 (0.000) ***
BT	0.117 (0.010) ***	-40.324 (0.000) ***	21.626 (0.006) ***	1.911 (0.262)
TTP	0.100 (0.641)	15.420 (0.271)	-7.478 (0.508)	-3.102 (0.143)
LLP	-0.519 (0.004) ***	8.464 (0.735)	1.320 (0.95)	-0.479 (0.889)
WWP	0.814 (0.000) ***	-6.607 (0.106) **	-3.255 (0.347)	2.418 (0.007) ***
FF	0.681 (0.000) ***	13.471 (0.130)	-8.501 (0.248)	-0.688 (0.593)
PPP	-1.080 (0.893)	-675.307 (0.858)	280.977 (0.860)	77.697 (0.855)
CCP	0.282 (0.005) ***	7.882 (0.169)	-8.017 (0.204)	0.808 (0.397)
PetP	0.069 (0.209)	36.627 (0.002) ***	-43.147 (0.000) ***	7.300 (0.000) ***
RP	0.314 (0.014) **	-1.818 (0.876)	-1.301 (0.881)	1.364 (0.222)
PP	0.316 (0.001) ***	19.008 (0.001) ***	-12.795 (0.010) ***	-0.442 (0.636)
NMMP	-0.200 (0.036) **	-7.329 (0.070) *	-4.775 (0.148)	4.811 (0.000) ***
BMP	0.639 (0.000) ***	-1.096 (0.841)	-3.883 (0.425)	1.733 (0.251)
FMP	0.427 (0.000) ***	13.038 (0.085) *	-3.115 (0.616)	-2.941 (0.007) ***
ME	0.190 (0.002) ***	-13.895 (0.014) **	7.040 (0.115)	1.678 (0.016) **
EEP	0.542 (0.000) ***	-21.626 (0.008) ***	15.571 (0.013) **	0.610 (0.372)
TE	0.217 (0.006) ***	-17.533 (0.055) *	11.229 (0.126)	1.121 (0.368)
SME	0.414 (0.003) ***	-4.667 (0.530)	5.109 (0.532)	0.025 (0.990)
MISC	0.192 (0.033) **	16.171 (0.371)	-8.947 (0.562)	-1.513 (0.484)

Notes: ***, **, * denote significant level at 1%, 5% and 10% based on MacKinnon's critical value respectively. The value in bracket (.) is *p*-value. The trend specification is assumed by restricted constant and no trend.

The second 'segment' of equation (3) - the estimated error-correction models are reported in Appendix B, but their estimates are not being discussed lengthily here since this study is aimed to look at the long-run impact of foreign investment on employment which is a considerable concern in both real (i.e. labour) and financial (i.e. foreign investment) sectors. In general, the estimated error-correction term (ect_{t-1}) is statistically significant at least at 10% level for all of the 19 industries that it reinforces a cointegration (long-run relation) between employment and foreign investment along with human capital, population and real GDP. This is to note that the estimated coefficient of error-correction term, ect_{t-1} measures the speed of adjustment of the *i*-th endogenous variable towards the equilibrium (i.e. long-run). Theoretically, it is expected to be in a negative sign less than one. However, some cases such as PetP is more than one, -1.589 which is 'explosive' that 158.9% of the disequilibrium is corrected wit hin a year or in 7.6 months. In the short-run, growth of foreign investment ($\Delta lnFI$) i.e. more capital flow in into the host country has impacted the growth of employment, but it is varying in terms of their estimated sign, and size for the 19 industries. The three crises dummy variables (i.e. *Dummy_1985-1986*, *Dummy_1997-1998* and *Dummy_2008-2009*) have different implications on the Malaysian employment - either positive or negative their estimated sign, depending on the nature of the underlying industries. The estimated equations of the 19 industries are considerably stable as suggested by the CUSUM and CUSUM of squares tests, except for Electronics and Electrical Products (EEP), and Transport Equipment (TE) by CUSUM of squares test.

4. Conclusion

To refresh, this study looks at the effects of foreign investment inflows on employment for 19 industries in Malaysia for the period between 1980 and 2016. *Yes! Foreign investors bring their capital (money) in and make more jobs for us.* This conclusion is based on the main findings as summarized. First, of the cross-sectional data analysis of 19 industries, foreign investment shows a positive effect on employment between 1980-2016. The largest elasticity is 0.85 (i.e. inelastic) for the year of 1995. Second, real foreign investment inflows and employment of the 19 industries are cointegrated (i.e. a long-run relation) with human capital, population and real GDP as control variables. And, third, foreign investment has a long-run effect on employment for the 19 industries, expect for Textiles and Textile Products, Paper, Printing and Publishing, and Petroleum Products. Both the Leather and Leather Products, and Non-Metallic Mineral Products industries have a negative sign, suggesting that both investments are about more capital-intensive goods.

This study is feasible for policymakers, especially for the capital markets in formulating relevant policy in promoting foreign investment inflows in order to create employment in the era of Industrial Revolution 4.0 (Ministry of International Trade and Industry, 2018). It includes strengthening policies and practices those support economic development, improve service delivery and infrastructure, financial services, and address regulatory barriers.[4] More importantly, labour policy should encourage domestic workers' participation than of the *cheaper* low skill foreign workers (World Bank, 2015) for the jobs created by foreign investors with quota requirement, incentives and rewards. for examples. Other trade related policies are important such as those to promote market integration of the exporting industries - the potential industries that of interest of the foreign investors with bringing more jobs.

By and large, a few of limitations have been encountered in this study. Firstly, this study employs highly aggregated data of foreign investment and employment for 19 industries, instead of sectoral/firm-level data. Secondly, other relevant control variables are not included such as wages, industry's characteristics (i.e. production, years of operation, turnover, etc.) because of data unavailability. Also, further study can include an indicator of public investment as a macroeconomic control variable as higher levels of public investment could push up industries' profitability and hence employment at the industry level, in the long-run. Other relevant variables, export orientation, and physical capital accumulation both tend to influence growth and employment at the aggregate and industry levels in the long-run. Lastly, the findings are eventually based on time series data of 19 industries for the period 1980-2016, and omit some benefits of using panel data (N x T, i.e. 19 x 37) in analysis such as controlling for individual heterogeneity, more informative data, dynamics of adjustment process and identification of parameters. Further research on this topic is recommended to employ highly disaggregation SITC (Standard International Trade Classification) data, and to consider other relevant variables as outlined above as well as dummy variable(ies) to capture the government's policies implemented or shocks. Of course, panel data testing methods can be applied with the current dataset for comprehensiveness.

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Appendices

Appendix A: Cross-sectional OLS regression estimates of 19 industries between 1980 and 2016 (dependent variable: $\Delta ln EM_i$)

Year	Coefficient of $lnFI_i$	Constant	Adjusted R^2	F-statistic (*p*-value)
1980	0.511 (0.000)***	-1.634 (0.279)	0.665	36.658 (0.000)
1981	0.581 (0.000)***	-2.900 (0.079)	0.711	45.253 (0.000)
1982	0.309 (0.001)***	1.898 (0.199)	0.429	14.518 (0.001)
1983	0.034 (0.001)***	2.065 (0.130)	0.450	15.747 (0.001)
1984	0.294 (0.029)**	2.289 (0.029)	0.207	5.699(0.029)
1985	0.604 (0.000)***	-3.078 (0.019)	0.812	78.945 (0.000)
1986	0.370 (0.006)***	0.565 (0.786)	0.336	10.097 (0.006)
1987	0.399 (0.005)***	-0.059 (0.980)	0.345	10.469 (0.005)
1988	0.333 (0.000)***	1.837 (0.212)	0.498	18.844 (0.000)
1989	0.209 (0.031)**	4.284 (0.027)	0.196	5.392(0.033)
1990	0.562 (0.003)***	-3.018 (0.359)	0.392	12.606 (0.002)
1991	0.422 (0.008)***	-0.066 (0.982)	0.308	9.012 (0.008)
1992	0.428 (0.002)***	-0.284 (0.900)	0.418	13.918 (0.002)
1993	0.412 (0.025)**	-0.069 (0.983)	0.218	6.027 (0.025)
1994	0.409 (0.005)***	0.142 (0.955)	0.346	10.520 (0.005)
1995	0.853 (0.000)***	-8.742 (0.003)	0.707	44.513 (0.000)
1996	0.261 (0.000)***	2.872 (0.017)	0.531	21.406 (0.000)
1997	0.245 (0.000)***	3.095 (0.015)	0.467	16.792 (0.000)
1998	0.467 (0.002)***	-1.262 (0.603)	0.395	12.737 (0.002)
1999	0.121 (0.064)*	3.880 (0.048)	0.140	3.923 (0.064)
2000	0.460 (0.003)***	-1.310 (0.619)	0.388	12.395 (0.002)
2001	0.771 (0.000)***	-7.509 (0.000)	0.776	63.533 (0.000)
2002	0.329 (0.062)*	1.191 (0.710)	0.142	3.988 (0.062)
2003	0.424 (0.000)***	-0.502 (0.806)	0.463	16.492 (0.000)
2004	0.474 (0.005)***	-1.291 (0.654)	0.350	10.695 (0.005)
2005	0.549 (0.001)***	-2.751 (0.313)	0.460	16.323 (0.001)
2006	0.533 (0.000)***	-2.597 (0.217)	0.588	26.705 (0.000)
2007	0.462 (0.001)***	-1.282 (0.567)	0.485	17.940 (0.000)
2008	0.459 (0.002)***	0.425 (0.621)	0.425	14.297 (0.001)
2009	0.239 (0.002)***	3.002 (0.029)	0.415	13.782 (0.002)
2010	0.412 (0.001)***	-0.302 (0.878)	0.484	12.857 (0.001)
2011	0.450 (0.001)***	-1.038 (0.626)	0.485	17.968 (0.001)
2012	0.454 (0.000)***	-1.214 (0.436)	0.653	34.836 (0.000)
2013	0.509 (0.001)***	-2.358 (0.378)	0.441	15.175 (0.001)
2014	0.315 (0.000)***	1.756 (0.126)	0.639	32.869 (0.000)
2015	0.315 (0.000)***	1.571 (0.072)	0.748	54.527 (0.000)
2016	0.303 (0.000)***	1.659 (0.149)	0.611	29.240 (0.000)

Notes: The value in bracket (.) is *p*-value. ***, **, and * indicate significant at the level of 1%, 5%, and 10% respectively. The subscript, *i* is the cross-sectional data of 19 industries.

Appendix B: Error-correction model (ECM) regression equations (dependent variable: $\Delta ln EM_t$)

Industry	FM	BT	TTP	LLP	WWP	FF
Intercept	408.551 (0.000)	-685.989 (0.000)	175.951 (0.000)	-19.952 (0.000)		302.811 (0.000)
$\Delta ln EM_{t-1}$	0.801 (0.000)	0.258 (0.111)			0.350 (0.000)	0.978 (0.008)
$\Delta ln EM_{t-2}$	0.185 (0.064)					0.485 (0.049)
$\Delta ln FI_t$	0.361 (0.000)	0.089 (0.014)	0.449 (0.000)	-0.068 (0.214)	0.496 (0.000)	0.323 (0.001)
$\Delta ln FI_{t-1}$	-1.244 (0.000)		0.526 (0.000)	0.549 (0.000)	-0.567 (0.000)	-0.738 (0.006)
$\Delta ln FI_{t-2}$	-0.510 (0.000)		0.339 (0.001)	0.211 (0.001)		-0.398 (0.017)
Control variable						
$\Delta ln HC_t$	-5.257 (0.699)		-31.807 (0.127)	67.315 (0.299)	63.178 (0.000)	
$\Delta ln HC_{t-1}$				254.896 (0.003)	7.638 (0.639)	
$\Delta ln HC_{t-2}$				-	-140.835 (0.000)	
$\Delta ln POP_t$	-1294.04 (0.000)	318.723 (0.000)	-178.29 (0.000)	520.933 (0.287)	461.963 (0.000)	-995.338 (0.004)
$\Delta ln POP_{t-1}$	2253.123 (0.000)			-1875.68 (0.045)	-305.347 (0.000)	1689.789 (0.004)
$\Delta ln POP_{t-2}$	-1547.28 (0.000)			1674.186 (0.002)		-1095.930 (0.002)
$\Delta ln Y_t$	-1.881 (0.045)		0.392 (0.797)	8.683 (0.013)	0.370 (0.609)	2.748 (0.126)
$\Delta ln Y_{t-1}$	3.070 (0.001)			-0.047 (0.984)	0.218 (0.678)	3.040 (0.056)
$\Delta ln Y_{t-2}$	2.378 (0.005)			7.495 (0.003)	-2.473 (0.000)	-
Dummy_1985-1986	1.697 (0.000)	-0.432 (0.494)	-0.505 (0.175)	-1.589 (0.113)	0.010 (0.960)	-0.136 (0.788)
Dummy_1997-1998	0.706 (0.001)	1.251 (0.073)	0.299 (0.362)	1.853 (0.019)	0.054 (0.719)	0.218 (0.527)
Dummy_2008-2009	0.681 (0.001)	0.179 (0.775)	-0.312 (0.310)	1.231 (0.039)	-0.929 (0.000)	0.280 (0.387)
ect_{t-1}	-2.466 (0.000)	-1.807 (0.000)	-0.851 (0.000)	-1.356 (0.000)	-1.507 (0.000)	-2.019 (0.000)
Adjusted R^2	0.902	0.739	0.793	0.855	0.956	0.704
Durbin-Watson	2.747	2.278	2.214	2.572	2.794	2.611
LM test (*F*-sta.)	2.615 (0.118)	1.306 (0.292)	0.806 (0.463)	2.347 (0.138)	3.788 (0.053)	9.863 (0.003)
RESET test (*F*-sta.)	5.257 (0.041)	3.872 (0.144)	0.089 (0.769)	4.984 (0.044)	0.116 (0.739)	5.643 (0.032)
CUSUM (5%)	Stable	Stable	Stable	Stable	Stable	Stable
CUSUM of Squares	Stable	Stable	Stable	Stable	Stable	Stable

Notes: The reported figures are estimated coefficients with their *p*-values in in bracket (.). LM test refers to Breusch-Godfrey (Godfrey, 1996) serial correlation test, and RESET test (Ramsey, 1969) is for specification errors.

Appendix B *(continued)*

Industry:	PPP	CCP	PetP	RP	PP	NMMP
Intercept	-504.635 (0.000)	116.619 (0.000)	805.249 (0.000)	-22.284 (0.000)	382.474 (0.000)	-112.193 (0.000)
$\Delta lnEM_{t-1}$	-1.099 (0.000)	-0.284 (0.003)	0.259 (0.016)	0.307 (0.031)	0.332 (0.118)	1.067 (0.000)
$\Delta lnEM_{t-2}$	-0.601 (0.001)		0.420 (0.016)		0.388 (0.014)	0.445 (0.002)
$\Delta lnFI_{t}$	0.234 (0.001)		0.009 (0.628)	0.293 (0.002)	0.000 (0.997)	-0.029 (0.552)
$\Delta lnFI_{t-1}$	0.299 (0.003)				-0.254 (0.004)	0.500 (0.000)
$\Delta lnFI_{t-2}$	0.227 (0.012)					0.250 (0.000)
Control variable						
$\Delta lnHC_{t}$	-91.5669 (0.005)	26.521 (0.140)	113.352 (0.000)	65.935 (0.032)	63.101 (0.001)	-13.935 (0.510)
$\Delta lnHC_{t-1}$	6.942 (0.862)	2.052 (0.929)				175.444 (0.000)
$\Delta lnHC_{t-2}$	-143.670 (0.007)	-82.360 (0.002)				130.513 (0.004)
$\Delta lnPOP_{t}$	2083.748 (0.000)		-1765.472 (0.000)	-964.551 (0.002)	-848.337 (0.000)	2145.396 (0.000)
$\Delta lnPOP_{t-1}$	-3283.393 (0.000)		2864.213 (0.000)	2053.966 (0.000)	1048.080 (0.000)	-4317.950 (0.000)
$\Delta lnPOP_{t-2}$	1896.263 (0.000)		-1203.379 (0.000)	-963.551 (0.001)	-566.030 (0.000)	2819.848 (0.000)
ΔlnY_{t}	9.509 (0.000)	2.206 (0.039)	3.028 (0.086)		-0.520 (0.599)	0.015 (0.988)
ΔlnY_{t-1}	6.989 (0.000)	2.317 (0.005)	-7.617 (0.000)		2.870 (0.001)	-7.174 (0.000)
ΔlnY_{t-2}	4.912 (0.005)	2.808 (0.001)				-2.146 (0.025)
Dummy_1985-1986	1.240 (0.032)	0.967 (0.001)	0.747 (0.127)	-0.341 (0.412)	0.123 (0.632)	-0.002 (0.995)
Dummy_1997-1998	-0.257 (0.432)	-0.244 (0.248)	-0.412 (0.239)	-0.552 (0.150)	0.154 (0.422)	1.259 (0.000)
Dummy_2008-2009	-0.108 (0.696)	-0.157 (0.365)	1.250 (0.001)	0.293 (0.410)	-0.323 (0.081)	-1.825 (0.000)
ect_{t-1}	-0.079 (0.000)	-1.068 (0.000)	-1.589 (0.000)	-1.746 (0.000)	-1.763 (0.000)	-3.222 (0.000)
Adjusted R^2	0.875	0.882	0.812	0.748	0.741	0.884
Durbin-Watson	2.305	2.581	2.873	2.121	2.706	2.677
LM test (*F*-sta.)	5.239 (0.050)	3.394 (0.059)	7.045 (0.008)	0.696 (0.512)	7.738 (0.006)	2.035 (0.187)
RESET test (*F*-sta.)	0.228 (0.643)	0.542 (0.472)	0.143 (0.710)	5.016 (0.038)	0.856 (0.307)	0.012 (0.916)
CUSUM (5%)	Stable	Stable	Stable	Stable	Stable	Stable
CUSUM of Squares	Stable	Stable	Stable	Stable	Stable	Stable

Notes: The reported figures are estimated coefficients with their *p*-values in in bracket (.). LM test refers to Breusch-Godfrey (Godfrey, 1996) serial correlation test, and RESET test (Ramsey, 1969) is for specification errors.

Appendix B *(continued)*

Industry	BMP	FMP	ME	EEP	TE	SME	MISC
Intercept	34.925 (0.000)	179.858 (0.000)	-262.327 (0.000)	-315.423 (0.000)	-246.853 (0.000)	218.977 (0.001)	213.275 (0.000)
$\Delta ln EM_{t-1}$	1.026 (0.001)		0.567 (0.000)	0.147 (0.082)		1.120 (0.016)	
$\Delta ln EM_{t-2}$	0.770 (0.001)		0.351 (0.000)	0.234 (0.009)		0.600 (0.013)	
$\Delta ln FI_{t}$	0.500 (0.000)	0.361 (0.000)				0.478 (0.000)	0.115 (0.002)
$\Delta ln FI_{t-1}$	-0.675 (0.001)					-0.615 (0.019)	
$\Delta ln FI_{t-2}$	-0.215 (0.021)					-0.499 (0.006)	
Control variable							
$\Delta ln HC_{t}$	14.080 (0.527)	21.900 (0.247)		32.164 (0.002)	-45.181 (0.013)	-9.540 (0.895)	104.480 (0.003)
$\Delta ln HC_{t-1}$	-4.966 (0.861)	-38.158 (0.088)				52.979 (0.549)	
$\Delta ln HC_{t-2}$	-102.71 (0.014)					230.269 (0.021)	
$\Delta ln POP_{t}$	1433 (0.000)	-444.831 (0.016)	1506.201 (0.000)	1339.737 (0.000)	1312.551 (0.000)	-835.537 (0.005)	1481.813 (0.000)
$\Delta ln POP_{t-1}$	-1751 (0.001)	717.095 (0.022)	-2745.265 (0.000)	-2213.641 (0.000)	2049.333 (0.000)	733.108 (0.006)	2302.472 (0.000)
$\Delta ln POP_{t-2}$	620.4 (0.007)	-588.842 (0.003)	1553.632 (0.000)	1235.848 (0.000)	989.792 (0.000)		1073.364 (0.001)
$\Delta ln Y_{t}$	3.451 (0.030)	1.099 (0.278)	1.068 (0.240)	-0.266 (0.685)	3.403 (0.005)		3.545 (0.092)
$\Delta ln Y_{t-1}$	-0.678 (0.547)	4.419 (0.000)			-1.187 (0.143)		3.877 (0.014)
$\Delta ln Y_{t-2}$	-2.279 (0.030)	2.373 (0.010)			1.202 (0.139)		-2.319 (0.143)
Dummy_1985-1986	0.225 (0.539)	0.126 (0.654)	0.271 (0.284)	-0.179 (0.310)	0.261 (0.385)	1.284 (0.218)	1.461 (0.018)
Dummy_1997-1998	-0.155 (0.533)	-0.495 (0.025)	0.111 (0.519)	0.448 (0.008)	0.342 (0.124)	0.387 (0.578)	0.333 (0.385)
Dummy_2008-2009	-1.194 (0.001)	0.130 (0.482)	0.081 (0.636)	-0.107 (0.368)	-0.008 (0.968)	-0.849 (0.177)	0.322 (0.387)
ect_{t-1}	-2.645 (0.000)	-1.451 (0.000)	-1.741 (0.000)	-1.173 (0.000)	-1.211 (0.000)	-2.595 (0.001)	-1.161 (0.000)
Adjusted R^2	0.863	0.818	0.893	0.909	0.814	0.848	0.701
Durbin-Watson	2.670	2.329	2.085	2.115	2.306	2.310	2.553
LM test (*F*-sta.)	3.294 (0.084)	1.008 (0.390)	1.008 (0.386)	1.338 (0.290)	0.457 (0.641)	1.407 (0.280)	2.155 (0.151)
RESET test (*F*-sta.)	0.832 (0.383)	0.075 (0.788)	2.422 (0.137)	0.826 (0.376)	0.017 (0.897)	0.434 (0.521)	0.093 (0.765)
CUSUM (5%)	Stable	Stable	Stable	Stable	Stable	Stable	Stable
CUSUM of Squares	Stable	Stable	Stable	2013	2012-2014	Stable	Stable

Notes: The reported figures are estimated coefficients with their *p*-values in in bracket (.). LM test refers to Breusch-Godfrey (Godfrey, 1996) serial correlation test, and RESET test (Ramsey, 1969) is for specification errors.