Impact of Globalization on Labour Productivity in the Malaysian Construction Sector

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Abstract: The sector has contributed significantly to the economic growth and employment in Malaysia. In the present era of globalization and liberalization, the growth of the construction sector should be more robust in line with the flexibility in the policies regarding the possession of properties in Malaysia and the increasing global demand. This article aims to analyze the impact of globalization on labor productivity in the construction sector using 1990-2009 panel data collected from the Department of Statistics Malaysia. The construction sector is divided into four sub-sectors, namely, residential building, non-residential building, installation of building and civil engineering. Indicators of globalization such as foreign direct investment (FDI), economic openness and foreign labor are used as part of the independent variable in the analysis. Estimation results show FDI and economic openness are statistically significant in influencing the labor productivity in the construction sector, but the ratio of foreign labor to total employment in the construction sector is not significant.
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1. Introduction

The contribution of the construction sector to the Malaysian economy is considerably significant and important. This industry has changed in the last decade and has moved in line with globalization. Rapid economic development has boosted demand for property in Malaysia and the relaxation of the government to own property among foreigners has provided opportunities for the construction sector continues to grow. The importance of the construction industry can be seen clearly through its involvement in various types of construction such as residential buildings, shops, office buildings, schools, institutions and others.

Generally, the construction sector encounters a moderate growth rate, which is between 3-4 per cent for the period 1990-2000. But it is higher compared to some other subsectors such as electricity, gas and water in the services sector, which the growing rate is of 2-3 per cent for the same period. Construction output growth rate reached the highest in 1995, at 4.4 per cent compared with other years. The economic vibrancy drives this sector to grow before the economic downturn in 1997/1998.

Contribution of the construction sector on employment is also important to be discussed because it is related to the problem of unemployment. Number of employment in the construction is the fourth highest after the country's main sectors such as services, manufacturing and agriculture. In the Sixth Malaysia Plan (6-MP) the number of construction sector employment is the highest, although the number of other sectors' employment except for the manufacturing sector experienced a decline. This situation is consistent with the intense growth of construction output that was achieved at the end of the 6-MP, which was in 1995. However, number of employment in the construction sector experienced the lowest volatility in the Ninth Malaysia Plan (9-MP). Malaysia's economic downturn during the financial crisis that took place in 2007/2008 contributed to less employment generation in the construction sector. During the crisis the real estate sector was also affected which further dampen the activity of this sector through the reduction in output and employment.

Although, theoretically, the inflow of FDI will have positive spillover effects on productivity, empirical researches show mixed results. The magnitude of spill over varies across the level of technology, capital intensity of industries, skilled labor, the domestic firm size, and the pattern of each country's FDI. Barrios (2002) and Ramirez (2006) reviewed the effect of FDI on productivity by using the endogenous growth model showing the existence of positive relationship between FDI in labor performance. In the context of the construction sector FDI spill over obtained through the supply of inputs and machinery for the use of this sector. The presence of foreign investors involved in the manufacturing project provides access for the construction sector to get input at a lower price compared with the imported inputs.

Economic theory suggests that increasing access to economic openness can affect the productivity of the firm through the channels that can

be summarized broadly such as the increment in competitive pressures, changes in market share, increase access to technology, as well as spillover effects. Whether the effects are positive or negative, are very much dependent on market structure and types of instruments used in trade. For the construction sector, economic openness facilitates the inflow of foreign inputs, including skills. There are construction projects that depend on foreign expertise, such as mega projects KLCC and KL tower. Parts of the intermediate inputs in construction sector are not available locally and had to be imported directly from abroad. Furthermore, foreign workers, especially the semiskilled and unskilled workers are very much needed by the construction sector in Malaysia. In fact, the majority of lower level employees in this sector are dominated by the foreign workers due to the unwillingness of the local workers to work in the construction sector that is considered dangerous and less attractive. Therefore, based on these arguments, all the variables of globalization, FDI, economic openness and foreign labor will have positive impact on labor productivity in the construction sector.

2. Literature Review

The idea that FDI increase the productivity of local companies proposed by Caves (1974) when he tested the benefits of FDI in the manufacturing sector of the two leading host country during that time which is Canada and Australia. He pointed out that FDI increase productivity through the competition between the enterprises. FDI also pushed technology to the next level and innovation for local firms. His research in Canada found that the correlation between the shares of subsidiary companies and local manufacturing productivity level is not clear due to the limited data problem, while in Australia, this correlation is clear and positive.

However, Globerman (1979) showed that labor productivity in the firm has a positive relationship with the presence of FDI in Canada. He showed that FDI leads to some spillover such as industry capital intensity, economies of scale, and quality of labor. Liu et al. (2000) supported this idea in their review of the 48 industries in the United Kingdom. They prove that the greater the technological capabilities of British companies, the greater the benefits they receive from FDI. Liu et al. (2000) in another study also showed that FDI has a positive effect on labor productivity in the electronics industry in China, and they concluded that the most important determinant is the quality of labor, followed by the domestic firm size and level of foreign investment.

According to Vahter (2004), positive spill over from FDI depends on the level of economic development of host country. Based on his research, there is no positive spill over of FDI in Estonia. He found that export-oriented foreign companies have lower labor productivity than domestic market-oriented companies and owned by local and foreign investors. On the contrary, in Slovenia, the export-oriented companies of local and foreign combination are not correlated with labor productivity. The results showed that different types of FDI would have different effects on the productivity of the host country. As for Kien (2008) and Vahter (2004), the most important advantages of FDI for host countries are acquiring modern technology, management skills and marketing skills in addition to capital.

Although many previous studies concluded that the effect of FDI on the productivity of the firm is clear and positive, but there are also studies showing that this effect is obscure and even negative. According to Aiken and Harrison (1999), the productivity of local firms decreased when the foreign investment increased in Venezuela. They proved that the positive relationship between venture companies and productivity of domestic companies is sound for only small local firms with less than 50 employees. Thus, they concluded that this relationship is relatively small and ambiguous. This conclusion is different from the Caves (1974) from Liu et al. (2000).

Konings (2000) found that there were negative effects of FDI on the productivity of local firms in market, including Bulgaria, Romania and Poland. He argued that the effects will depend on the conditions in the receiving country and proved that they have a positive correlation with the level of development and different types of FDI (whether joint ventures or projects wholly owned by foreigners), and also the level of labor skills. This decision was supported by Thiam (2006) who found the positive relationship between FDI and productivity in eight East Asian economies - China, Hong Kong Special Administered Region of China, Indonesia, Malaysia, Republic of Korea, Singapore, Taiwan, China and Thailand.

Pradhan (2004) then concluded that the efforts made to promote R & D and some centralization of the size of local firms in the industry may be better than a passive liberalize FDI policy from the standpoint of increasing the efficiency of local enterprises productivity. In his study, the hypothesis spill over of FDI was tested in the pharmaceutical industry in India by using the unbalanced panel data for the sample firms in the period 1989-1990 to 2000-2001. The study found that the presence of foreign companies might be

unimportant for the local firm productivity growth unless it is supported by R & D. Contradict with the opinion of Bohra (2011) in the analysis of India's economic sectors who found that FDI has helped to increase output, productivity and employment in some sectors, especially in the services sector. He stated that FDI is a tool for economic growth by strengthening capital, domestic productivity, and employment. FDI plays an important role in the grading of the technology, skills and management capabilities in various sectors of the economy. The analysis proved that FDI is an important stimulus for economic growth of India in which the growth of FDI increased the output and productivity in the services sector.

Wong (2006) concluded that trade liberalization of Ecuador improved manufacturing productivity. In his study, the focus was on changes in productivity and restructuring of resources from less to a more productive unit. It applied the robust estimation procedure on the micro-level data to identify the impact of policies on productivity and economic problems that can interfere with productivity levels throughout the study. The study took particular interest in seeing how the competing imports and exports respond to trade openness. Wong (2006) stated that there are positive and significant evidence of trade openness on the productivity of the manufacturing industry for export-oriented industry after the trade executed.

Nevertheless, for Casabucerta et al. (2004), they stated that there was no evidence of dynamic changes in productivity across different industry concentration levels. Analysis has been done on the effects of trade liberalization on labor and gross capital flows as well as productivity in the country's production sector of Uruguay. Openness to the international environment had increased the employability rates and reduced the capital. Although industry concentration reduced the level of job elimination, it has no impact on employability or capital dynamics. Changes in the use of labor and capital followed by the increasing productivity occurred only for certain sectors with the reduction of the tariff is large and no union. Therefore, trade openness actually can give different effects on different segments of the industry (Abizadeh et al., 2007).

Rapid increment in the demands of foreign employees reflects the excess demand and rapid economic growth, as well as their cheaper cost. Zaleha et al (2011) found that foreign workers have a positive impact on labor productivity of the manufacturing sector. In the long run, immigrants do not affect the local unemployment rate, but increase productivity and average income of the destination country (Abdul Kadir et al., 2005). These findings are consistent with the study in the United States (Peri, 2010) and supported by Nikolaj et al. (2011), and Ottaviano and Peri (2008). Nikolaj et al. (2011) studied of how foreign expertise influenced the productivity and wages of local firms in Denmark and found that the firms employing foreign expertise were capable of raising productivity and higher wages and a tendency to continue to employ foreign expertise.

3. Methodologies and Model Specifications

The labor productivity model used in the analysis of this article is based on the Cobb-Douglas production function.

$$Y = AK^{\beta 1} L^{\beta 2} \qquad (1)$$

where Y is total output, A is the parameter, K is capital stock and L is the total force. Marginal product is derived from equation (1) as follows:

$$\frac{\partial Y}{\partial L} = \frac{\partial}{\partial L}\left[Y(K,L)\right] = \beta_2 AK^{\beta 1} L^{\beta 2-1}$$

$$= \frac{1}{L}\beta_2 AK^{\beta 1} L^{\beta 2} \qquad (2)$$

Or,

$$\frac{\partial Y}{\partial L} = \beta_2 \frac{Y}{L} \qquad (3)$$

From equation (3), the average output of labor (Y / L) is equal to labor productivity. This function can be derived as follows:

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$$\frac{Y}{L} = \frac{\partial Y}{\partial L}\frac{1}{\beta_2} \qquad (4)$$

Substitute $\frac{\partial Y}{\partial L}$ from equation (2), then equation (4) become

$$\frac{Y}{L} = \beta_2 \frac{AK^{\beta 1} L^{\beta 2}}{L} \frac{1}{\beta_2}$$
$$= AK^{\beta 1} L^{\beta 2-1}$$
$$\frac{Y}{L} = A\left(\frac{K}{L}\right)^{\beta 1} L^{\beta 1+\beta 2-1} \quad (5)$$

Equation (5) can be written in the form of natural logarithms as:

$$\ln\left(\frac{Y}{L}\right) = \ln A + \beta_1 \ln\left(\frac{K}{L}\right) + (\beta_1 + \beta_2 - 1)\ln L \quad (6)$$

To see the impact of globalization on labor productivity, the globalization variables are added in equation (6) and estimated equation will be as follows:

$$\ln\left(\frac{Y}{L}\right)_{it} = \beta_0 + \beta_1 \ln\left(\frac{K}{L}\right)_{it} + \beta_2 (LPROF/L)_{it}$$
$$+ \beta_3 (LTEK/L)_{it} + \beta_4 (FL/L)_{it} +$$
$$\beta_5 \ln FDI_t + \beta_6 OPN_t + \varepsilon_{it} \quad (7)$$

where,

$\ln A = \beta_0$

lnY / L = the natural logarithm of labor productivity; real output in the construction sector is divided with the total force for the sector.

lnk / L = the natural logarithm of capital Intensity; true value of the assets owned by the construction sector is divided with the total labor sector.

lnFDI = natural logarithm of Malaysia's real foreign direct investment value

OPN = level of Malaysia's economic openness; the export and import value is divided with the real GDP.

LPROF / L = ratio of local professionals employment to total employment in the construction sector.

LTEK / L = ratio of local employment for the technical category to total employment in the construction sector.

FL / L = ratio of foreign employment to total employment in the construction sector.

i = the various selected building categories, which consists of four construction sub-sectors.

t = time.

B0-β6 = estimator coefficient

ε = error term

3.1 Source of Data

Data Y, L, Prof. TEK and FL were obtained from the Construction Industry Survey Report, Department of Statistics Malaysia, FDI data were obtained from the Ministry of International Trade and Industry (MITI), while data on exports, imports and GDP were obtained from the Economic Report, Ministry of Finance, Malaysia. Year 2000 was the basis for real data.

3.2 Static Data Panel

Typically, a panel data analysis model used is the constant coefficient estimator, estimators of fixed effects and random effects. Constant coefficient estimator model is also known as pooled regression model and this model is using fixed effect, which is known as the Least Square Dummy Variable Model (LSDV), which refers to the model with a constant slope but different intercept based on cross-sectional units. Random effects estimator model refers to the fixed random regression with cross-sectional units error that do not relate to the variables error in the model. It was found that the value of cross section of sub-sectors was four sub-sectors and it was smaller than the regression number, 6 variables, resulting in failure of random effects estimator that could not be performed due to the insufficient requirements. The regression number must be smaller than the number of cross-section.

3.3 Dynamic Data Panel

The analysis of panel data based on constant estimators, fixed effects or random effects could not coordinate heterogeneous dynamics in long-term relationship equilibrium (Pesaran et al., 1995). Long-term parameters are more consistent if estimated using autoregressive distributed lag approach (ARDL) (Pesaran & Shin, 1999). In addition, as found by Pesaran et al. (1999) this approach has been consistent in producing long-term coefficient estimators whether the basic repressor I (1) or I (0). Therefore, the estimated Mean group (MG) and the Pooled Mean Group (PMG) is conducted in this study for a dynamic panel data analysis.

3.3.1 Pooled Mean Group (PMG)

PMG is based on autoregressive distributed lagged (ARDL) model that has the advantage to determine the dynamics long-term and short-term relationships. Panel analysis on the unrestricted error correction ARDL (p, q) (Pesaran et al., 1999):

$$\Delta y_{it} = \phi_i y_{i,t-1} + \beta_i' x_{i,t-1} +$$
$$\sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it}$$

$$\Delta y_{it} = \phi_i y_{i,t-1} + \beta_i' x_{i,t-1} +$$
$$\sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it} \quad (8)$$
$$i = 1,2,...; t = 1,2,...T$$

with v is the dependent variable, x_{it} is the kx 1 vector of (weakly exogenous) regressor for group i, μ_i represents the fixed effects, ϕ_i are scalar coefficients on lagged dependent variable, β_i is a 1xk coefficient vector on describing variables, λ_{ij} is scalar coefficients of the lagged dependent variable in first differentiation, and γ_{ij} is the kx 1 vector of coefficients on variables that explain the first differentiation and lagged values.

Disruption in ARDL model is considered having no relation on all i and t, with mean zero and variance > 0.ϕ_i < 0 for all i and therefore long-term relationship exists between y_{it} dan x_{it} as defined by:

$$\Delta y_{it} = \phi_i \eta_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it} \quad (9)$$

$$y_{it} = \theta_i' x_{it} + \eta_{it}$$

$$i = 1,2,...;t = 1,2,...T$$

With kx1vector as the long-term coefficient and η_{it} as unchanged with the possibility of non-zero mean (including the fixed effects).
Equation (8) can be rewritten as

$$\Delta y_{it} = \phi_i \eta_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it} \quad (10)$$

Where $\eta_{i,t-1}$ is the correction of errors in (2), ϕ_i is the error correction coefficient that measures the speed of adjustment towards the long-term equilibrium.

Under this general framework, Pesaran et al. (1999) suggested PMG estimator. PMG allows intercept, short-term coefficients and the free difference error in all groups, but the long-term coefficients are constrained as well, $\theta_i = \theta$ for all i. The specific group of short-term and long-term coefficients was calculated by the pooled maximum likelihood estimator.

The rationale behind the expecting of long-term equilibrium relationships between the same variables across the groups was due to budget constraints or Solvency, arbitrage conditions, and common technology that affect all groups in the same way.

3.3.2 Mean Group (MG)

According to Pesaran and Smith (1995), less restricted procedure allows the diversity of all parameters (impose any restrictions on country borders). It consists of estimating separate regression estimates for each country to collect country specific coefficients.

Both MG and PMG estimation requires choosing an appropriate lag length for equation of individual countries; Schwarz Baysian Criterion (SBC) / Akaike Information Criterion (AIC). MG measurement provides a consistent long-term mean estimation even if this can be inefficient if the homogeneity sloping. In long-term sloping homogeneity, pooled estimators are consistent and efficient. MG estimation is the weighted mean of the regression of N individuals' coefficients. MG option is through all the panels in the sample to estimate the parameters of the equation (8). MG estimation is presented as a two-equation model of normal co-integration vectors and dynamic short-term coefficients.

3.3.3 Hausman test

The long-term homogeniti parameter hypothesis cannot be regarded as major, but it requires an empirical test in all specifications. The mean coefficient heterogeneity effects can be determined by the Hausman test (Hausman, 1978). Hausman test is used to distinguish between MG and PMG.

3.4 Analysis of Estimation Results

Table 1 shows the descriptive statistics of variables. In general, the labor productivity of this sector is RM3, 219. The average value of the capital-labor ratio is RM16, 616.2. This sector has a small ratio of professional workers and local technical workers, which is 4.9 per cent and 5.7 percent respectively. On the average, the ratio of foreign workers involved in the construction sector is about 10 per cent and the average FDI is RM 181 million for the whole economy of Malaysia. The degree of Malaysia's economic openness in the period 1990-2009 is 1727.

Model estimation is done through two methods of panel data analysis; using constant coefficient estimator model and fixed coefficient estimator model. The random effect estimator model was not used because the data does not meet the criteria of this model which requires a larger number of cross-sectional than regression number. The findings from both estimations were tested to select the best model using Wald F-test specifications. Hypothesis for this test is:
H_0 = constant coefficient estimator model
H_1 = fixed effects estimator model

Table 1: Descriptive Statistics of the Variable

Variable	Mean	Median	Maximum	Minimum	Standard Deviation	N
Y/L	3.219804	3.327600	3.562006	2.559085	0.277341	80
K/L	16.6162	15.6478	38.9682	0.0058	7.5735	80
LPROF/L	0.0489	0.0426	0.1995	0.0049	0.0278	80
LTEK/L	0.0572	0.0532	0.2192	2658.000	0.0315	80
FL/L	0.1034	0.1059	0.1135	0.07885	0.733761	80
FDI	181.3043	16347.70	48098.80	6287.000	10579.27	80
OPN	1.727	1.715	2.75	1.33	0.3001	80

Note:
Y / L = Real labour productivity in construction sector (RM '000)
K / L = ratio of real capital-labor in construction sector (RM'000)
PROF / L = ratio of the professional labor force to total labor force in construction sector
TEK / L = ratio of the technical labor force to total labor force in construction sector
FL / L = ratio of foreign labor force to total labor force in construction sector
FDI = foreign direct investment in Malaysia (RM million)
OPN = degree of economic openness of Malaysian (ratio)

It was found that by using F-Wald test, the results indicated that the fixed effects estimator model is better than the constant coefficient estimator model when H_0 is rejected. The R^2 value of fixed effects estimator is also higher than the R^2 value of constant coefficient estimator which is (0.7678> 0.7129). Thus, the fixed effects estimator model is better as an estimator model (see Table 2).

The results of estimation showed the capital-labor ratios are found to be significant in influencing the labor productivity in the construction sector. A 1 per cent increase in this ratio will increase labor productivity by 0.217 per cent. Capital-labor ratio may reflect the level of capital intensity and technology level of construction sector. These results suggested that more advanced technologies must be used in the construction and thus reduced the dependency on foreign workers. Similarly, the results show that the ratio of professional and technical labor to the total labor is not statistically significant in influencing labor productivity of the construction sector. This reflects that labor productivity in the construction sector does not depend on the proportion of skills, but more important is the capital intensity.

Estimation results further indicate that the globalization variables such as FDI and economic openness are significant in influencing the labor productivity in the construction sector. A 1% increase in FDI will increase labor productivity by 0.198 per cent, while an increase of one point in the economic openness will increase labor productivity by 0.6 per cent. FDI inflows into the economy helped the construction sector in getting inputs or materials, which are formerly imported. Similarly, the economic openness will facilitate the process of acquiring inputs that have still to be imported. It will further affect the efficiency of the production as well as enhancing the labor productivity.

Table 2: Results of estimation of panel data using pooled model and the fixed model

Variables	Pooled Model	Fixed Effect Model.
INTERCEPT	1.324001	1.209055
	(2.859052)***	(2.752268)**
lnK/L	0.034211	0.217161
	(0.632353)	(3.098030) ***
LPROF/L	111.1289	56.70393
	(2.238434)**	(1.183305)
LTEK/L	-89.72439	-30.31473
	(-2.181453)**	(-0.741287)
FL/L	-1.045849	-0.459362
	(-2.726353)***	(-1.109350)
lnFDI	0.256140	0.198548
	(5.180699)***	(4.064380)***
OPN	0.868520	0.618828
	(8.428508)***	(5.486481) ***
R-SQUARED	0.712891	0.767810
F-STATISTIC	30.20974	25.71970
	0.0000	0.0000

Wald F-test rejected H_0
Note: * / ** / *** significant at the significance level of 10%, 5%, 1%

3.5 The Results of Dynamic Data panel technique (PMG and MG)

Results of the PMG and MG methods are shown in Table 3. PMG estimation provides further details in panel data regression with long-term relationship objects separated from short-term relationship. PMG estimation shows a positive relationship between changes in OPN and FDI in the long term and short-term labor productivity growth, while the K / L and LPROF / L is positive and significant for the long term only. LTEK / L have a negative relationship in the long-term level of labor productivity. The positive relationship between economic openness with the labor productivity is consistent with the study of Wong (2006) who found that there is a positive and significant evidence of trade openness on the productivity of the

manufacturing industry for export-oriented industry after the trade activities were carried out.

The result of PMG estimation implies that FDI and economic openness is important to be increased in order to increase labor productivity in the construction sector. The effect occurs rapidly and persistently. The benefits of labor productivity from the capital-labor ratio and professionals labors only happen in the long run showing the effects of both variables on labor productivity takes a long time to occur. This may be due to the time consumption of new technology adaptation by professional labor. On the contrary, in the case of foreign workers, they contribute to increased labor productivity only in the short run, but when they stay longer in the construction sector, they no longer provide a significant contribution, which may be due to low skill levels. The findings of MG showed that most of the coefficients were not significant except for FDI variables, which showed a significant and positively-related relationship besides good labor productivity in the long run. Meanwhile, economic openness variable, technical labor and foreign labor were all significant and positive for short term only.

Hausman test showed that the results of PMG were more suitable compared to MG. The Hausman statistic calculated was 1.00 with χ^2 = 0.00. PMG estimator is a more efficient measurement under the null hypothesis, making PMG a better and more reliable method. In general, the result obtained from the ARDL specification is more consistent in describing the relationship between the dependent variable and the independent variable for the long-term compared to the traditional static data panel method. The results produced are consistent with the economic theories and fulfil the statistics requirements.

Table 3: The estimation of PMG and MG model

Pooled Mean Group and *Mean Group* Estimator
(dependent variable: Y/L_{it})

	PMG Estimator			MG Estimator				
	Coefficient	se	p- value	Coefficient	se	p- value	$\chi^2(2)$	P
Prod $_{it}$								
ΔlnK/L $_{it}$	0.2839	0.1506	0.059*	2.9821	4.1107	0.468		
Long-term	0.1125	0.1063	0.290	0.1151	0.0115	0.317		
Short-term								
ΔLPROF/L $_{it}$	6.1718	0.5443	0.000***	7.1644	9.3003	0.441		
Long-term	-0.0040	0.0430	0.925	0.0421	0.1077	0.696		
Short-term								
ΔLTEK/L $_{it}$	-4.4642	0.3316	0.000***	1.0847	3.3777	0.748		
Long-term	0.0041	0.0065	0.532	-0.0185	0.0094	0.050**		
Short-term								
ΔFL/L $_{it}$	0.0475	0.0580	0.413	1.0790	3.1872	0.735		
Long-term	0.1044	0.0429	0.015**	0.1463	0.0384	0.000***		
Short-term								
ΔlnFDI $_{it}$	-1.0453	0.0127	0.000***	-1.0443	0.0122	0.000***		
Long-term	0.0141	0.0079	0.074*	0.0227	0.0207	0.287		
Short-term								
ΔOPN $_{it}$	2.1284	0.1768	0.000***	-1.9061	2.5682	0.458		
Long-term	0.5516	0.3910	0.000***	0.2910	0.1687	0.084*		
Short-term								
Hausman Test							0.00	1.0000

Note: * / ** / *** significant at the significance level of 10%, 5%, 1%

4. Conclusion

The findings of this study showed that the FDI variables and economic openness are two important elements in escalating labour productivity in construction sector in Malaysia. This positive and strong relationship did not happened only in the short term but also in the long term. Although FDI in Malaysia is not directly occurred in the construction sector, but the presence of foreign investors who keeps opening up new projects facilitated the construction sector to get inputs at a cheaper price compared to the imported ones. However, not all inputs can be produced or available in the country. There are some which still needed to be imported

especially the high quality inputs for the construction of high-impact projects. Therefore, economic openness is helping a lot for this sector to get imported inputs.

When dynamic analysis is done, there are significant relationships between other variables such as professional and technical labour ratio and the ratio of foreign labour to total labour in the construction sector. But their relationship is different in the short and long term. For instance, the ratio of professional labour is positive and significant in the long term, while the technical labour ratio is negative and significant in the long term.

Based on these findings, several basic implications can be presented. The importance of FDI and economic openness in labour productivity is very clear, and this requires government commitment in the promotion of both activities. Encouragement for FDI should be supported with incentives and information that is able to attract foreign investors to invest in the country. Similarly, the capital intensity should be intensified to reduce our dependency on foreign labour especially in the long run. This means that in the long run, these two types of investments, namely human capital investment to improve the professional labours and physical capital investment to increase the capital intensity needs to be done. There are some physical capital investments made by foreign investors through FDI. In conclusion, the government should be sensitive towards important contributors to labour productivity in the construction sector to ensure the continuance of the development of this sector is maintained.

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