Globalisation and Labour Productivity in the Malaysian Manufacturing Sector

Abstract: Globalisation process has forced the Malaysian manufacturing sector to strengthen its ability to compete in the international market. Globalisation, coupled with advancement in information, communication and technology has increased the demand for quality labour, having knowledge and competing to maximise production. The objective of this paper is to analyse the depth of globalisation impact on labour productivity in the Malaysian manufacturing sector. The analysis has used data from the Manufacturing Industrial Survey, Department of Statistics Malaysia comprising 24 years, from 1985 to 2008 and selected six sub-industries. A multiple regression model using panel data is estimated to analyse the relationship between labour productivity using capital-labour ratio, number of labour, foreign direct investment (FDI), foreign labour, economic openness and technology. Findings of the study show that globalisation indicators like FDI and economic openness have negative and significant effect on labour productivity in the manufacturing sector. The dummy period after the year 1995 is positive and significant reflecting that the impact of globalisation on labour productivity in the Malaysian manufacturing sector is higher after the year 1995 as compared to the years prior to 1995.

JEL Classifications: J01, J08, J24
Keywords: Globalisation, Labour productivity, Manufacturing sector

1. Introduction

Globalisation is a phenomenon that cannot be avoided. The world economy is moving towards global integration. The globalisation issue has already been long debated by researchers. Hoogvelt (1997:117-118) characterised globalisation in terms of the world habitation being increasingly dependent in a system. This occurs through trade, ties and co-operation between countries, the existence of international organisations and the global awareness manifested through the exposure of the global community to unify communication through the compression of time and space. From the economic perspective, Thomas and Skidmore (1997) view globalisation as the expansion of companies through national boundaries.
In the manufacturing sector, labour and capital factor play a crucial role in contributing the output growth. Efficient labour has helped to increase productivity of this sector. Successful development not only covers growth of physical labour and capital but also growth of productivity. Understanding the fact that input is limited then emphasis must be shifted to productivity. Porter (1990) stated that the key for income per capita growth is productivity growth. While, the key for economic growth is innovation, the key to innovation is the success of the innovation system developed in a country.

The manufacturing sector is the main contributor to the Malaysian economic growth and acts as the engine of growth as its contribution to (GDP), employment and export is very pertinent. The development of this sector is supported by the participation of the country in international trade and foreign direct investment (FDI). The manufacturing sector’s contribution to GDP increased from 18.3 percent in 1970 to almost 31.9 percent in 2000 and 31.4 percent in 2005. The contribution of the manufacturing sector to total export also increased from 21.7 percent in 1980 to more than 85.0 percent in 2000 and 80.5 percent in 2005. The manufacturing sector also creates 27.7 percent job opportunities from total workforce in 2000 to 28.7 percent in 2005. This sector has recorded an average growth rate of 4.1 percent a year during the Eight Malaysia Plan (8MP). In the Ninth Malaysia Plan (9MP) the manufacturing sector has contributed 29.4 percent to total jobs creation (Malaysia 2006).

Globalisation can be linked with labour productivity through various ways including trade liberalisation or economic openness, exposure to new technology and FDI. FDI is often related to inflow of new technology to the recipient country. Developed countries usually use the latest production technology compared to the less developed countries. Therefore, spill over effect of technology can occur from the developed countries, the origin of FDI to the FDI recipient developing countries. The spill over effect enhances labour productivity through the acquisition of new technology.

Besides that, globalisation is also often associated with increase in competitiveness, which brings about the concept of global competitiveness; a measurement to investigate the depth a country is able to compete at the global level. According to the Global Competitiveness report (GCR) 2009-2010, the Malaysian overall competitiveness level has weakened, from the 21st position in Global Competitiveness Index (GCI) 2008-2009, it dropped to 24th position in the period 2009-2010 among 133 countries (MPC 2009).

Although in the GCR 2009-2010 period, the country’s competitiveness level recorded a decline but in the World Competitiveness Yearbook 2009 published by the Institute for Management Development (IMD) the situation is different. Malaysia’s competitiveness level is at the top 10th place among 58 countries, mostly recording an increase at the competitiveness level position from the previous year of 18th position. This proves that the country is capable of providing conducive investment environment climate to foreign investors.

In line with the aspiration of the government to make Malaysia a high per capita income country, the government has emphasised productivity and innovation based growth as implemented in the other high-income Asian countries like South Korea, Hong Kong, Singapore and Taiwan. Therefore, the Malaysian government is constantly monitoring the country’s competitiveness level and taking measures to enhance competitiveness from time to time. In the current situation, the government will continue to boost efforts to enhance the country’s competitiveness level (MPC 2010).

Therefore, the issue is that how far the globalisation indicators, like FDI, transfer of technology and economic openness can affect labour productivity. This article will answer this question by dividing the discussion into five sections. The next section discusses literature review, followed by methodology and source of data, results, conclusion and policy implication.
2. Literature Review

Increase in labour productivity benefits the employer, worker, consumer and the nation. To enhance global competitiveness, increasing labour productivity is essential. Increasing labour productivity also means increasing wealth shared together by the worker, employer and the nation. According to Chong Chee Leong (2000), there is a need to increase labour productivity by emphasising on quality input and effective process. Chong has also stated that there are five factors which influence the increase in productivity; those are capital, human resource, materials, information and technology.

Solow (1957) argues that labour productivity is the most important determinant influencing the nation’s level of income. Meanwhile, according to Englander and Gurney (1994), low labour productivity will be a barrier to income increment rate and can also increase the incidence of conflicts in income distribution. Labour productivity has a close relationship with economic growth and is a determinant of economic stability. Therefore, understanding the determinants and sources for increasing labour productivity is important to understand economic growth. Among the factors that increase labour productivity are technology, physical capital and human resources (Rahmah Ismail, 2009).

Empirical Study

Study on the effects of globalisation on labour productivity that analyses all the globalisation indicators as in this research is not common. Most of the studies focus on a particular globalisation indicator, for example, trade (export and import), and technology or FDI in detail. Discussion on the empirical findings is divided into three sections, namely, FDI and labour productivity; economic openness and labour productivity; and technology and labour productivity.

FDI and Labour Productivity

Chin Chen and Yir-Hueih (2000) studied the efficiency and growth of productivity in 10 Asian countries and found that FDI inflow contributes to increase in labour productivity through technological innovation. Xiaming Liu et al. (2001) study the impact of FDI on labour productivity in the Chinese electronics industry using panel data approach support this finding. Data from 47 sub sectors of the electronics industry from 1996 to 1997 was used. Results have shown that FDI has high positive impact towards labour productivity in the Chinese electronics industry.

Vather (2004) studied the impacts of FDI on labour productivity in the manufacturing industry for two selected countries in transition, namely, Estonia and Slovenia. The emphasis of the study was to investigate if the local market was export or import oriented. The study was based on panel data at the firm level. The results show that in Estonia, foreign firms that are export oriented have lower labour productivity compared to local firms with foreign investment and domestic market oriented. On the other hand, in Slovenia, firms with foreign investment are not significantly correlated to labour productivity. Furthermore, there is positive FDI spill over to local firms in Estonia, whereas, in Slovenia there is positive FDI impact but no FDI spill over in firms with foreign investment. The conclusion is that various types of FDI have different impact to the recipient country and the presence of positive FDI spill over depends on the level of economic progress of the recipient country.

Koirala and Koshal (1999) investigated the effects of entry of foreign firms in Nepal as an indicator of globalisation clearly prove that labour productivity in foreign firms is relatively higher than that in the domestic firms. Performance of labour productivity is found to be higher for foreign firms, although technically they are less efficient compared to the domestic firms. The main factor for this higher performance is because foreign firms are utilising capital-intensive technology.

Similar study by Robert and Thoburn (2004) analyses the effects on the entry of foreign firms and workers for the textile industry in Africa. The effects of investment of foreign firms in Africa
had changed the textile industry work force due to restructuring of firm operations utilising capital-intensive technology, rationalising production and focusing on various outputs. Results show that labour productivity has increased due to production operations utilising capital-intensive technology, which reduced total work force in the industry.

The study is supported by Rasiah and Gachino (2005) who found that labour productivity is higher in foreign firms compared to domestic firms in the textile industry and garment production in Kenya. Labour productivity achievement is motivated by higher technology intensity for the foreign firms. Nevertheless, Ramstetter (2004) argues differently from other studies, showing that globalisation impact, namely, foreign ownership has a weak relationship with labour productivity and wages in the services sector in Thailand.

Another study in the electronics industry in China found that FDI has positive impact on labour productivity in the industry through the direct utilisation of capital input, technology, management skills and indirect spill over effects towards the domestic firms. What is interesting is that labour productivity depends on the degree of foreign presence in the industry and other variables like capital intensity, human capital and firm size (Xiaming et al. 2001).

Economic Openness and Labour Productivity

Mei Hsu and Been-Lon Chen (2000) studied the factors that influence labour productivity between big and small sized firms in Taiwan’s manufacturing sector. The results show that increase in the export sector will increase labour productivity in small sized firms, but decrease labour productivity in larger firms. Foreign direct investment has positive effect on labour productivity for the smaller firms, but negative effect for the larger firms.

Study in Indonesia conducted by Sjoholm (1997) investigates if international trade openness affects labour productivity using services industry data from 1980 to 1991. The impact of international trade openness is tested using the data on industry’s participation in export and import. Results show that the export variable has positive impact on labour productivity. The bigger is the export from total output, the bigger the growth of labour productivity. Import also caused high growth of labour productivity. Sjoholm argued that trade liberalisation causes the transfer of technology and knowledge that eventually increases labour productivity of the industry in a country.

Prasiwi Westining (2008) studied the impact of international trade on labour productivity in the textile industry and textile product with the 5 digit industrial code in Indonesia using panel data from 1991 to 2005. The results of the study show that abolishing import quota gives negative influence on labour productivity; meanwhile, labour productivity is significantly influenced by the export intensity variable with positive effect.

Through the same method and approach, Phan (2004) studied the services industry in Thailand, Jayantha Kumaran (1999) studied the manufacturing industry in Australia from 1989 to 1997, while Bloch and Mcdonald (2000) studied the manufacturing industry in Australia from 1984 to 1993, and Kwak (1994) probed into the manufacturing sector in Korea. All four studies show that trade liberalisation has positive and significant impact on labour productivity.

Study by Hung et.al (2004) also analyses the impact of international trade on labour productivity and total factor productivity (TFP). Their study was more comprehensive, whereby; growth of labour productivity was divided into three, caused by changes in import price, impact of economies of scale towards new market for import and export changes. Change in import prices on labour productivity is positive and significant, whereby; a drop in import prices by one percent will increase growth of labour productivity by 3 percent for both of the models estimated, namely, fixed-effects model and random-effects model. Both models assume that the changes in import price are constant for the whole period. The second variable, new market for import is found to have a positive and significant role on the growth of labour productivity. When both the models assume changes in import prices differ, the new market for import variable also influences labour
productivity positively. The third factor increases export positively to influence growth of labour productivity. Paus et.al (2003) studied the relationship between trade liberalisation and labour productivity in the manufacturing sector among 27 industries in Latin America. He found that trade liberalisation has positive relationship with all variables under study, namely, export and import, and labour productivity in various aspects.

Differing from the study by Egger and Egger (2006), Tomiura (2007) studied the international outsourcing on labour productivity. Nevertheless, study by Tomiura (2007) also analysed other globalisation variables like export and foreign ownership through FDI. Study by Tomiura (2007) found that foreign firms have higher labour productivity compared to domestic firms that do international outsourcing. Egger and Egger (2006) focus on low skilled labour productivity in the manufacturing sector for Europe. The results show that in the short-run, international outsourcing has negative impact on labour productivity; meanwhile, in the long-run the impact is positive.

Technology and Labour productivity

Oulton (1990) studied labour productivity in the industrial sector in England during the 1970s and 1980s using the panel data. The results show that investment in new technology gives significant contribution to growth of labour productivity in the industrial sector, whereas, increase in price of intermediate goods makes labour productivity to decrease. Apergis et. al. (2008) studied the relationship between labour productivity, innovation and technology transfer in the services industry in six selected countries in Europe. They found that research and development (R&D), human capital and international trade could accelerate innovation process and facilitate transfer of technology. The results show that there is a balanced relationship between labour productivity, innovation and technology transfer in the long run. Furthermore, R&D, trade and human capital have statistically and significantly affected labour productivity through innovation and spread-out of technology.

3. Methodology and Data Source

Analysis in this paper adopts panel data approach from the Manufacturing Industrial Survey data, Department of Statistics Malaysia. The approach combines time series data with cross sectional data. The study covers 24 observations by time series, from 1985 to 2008 and 6 sub-industries, making 144 panel data observations. A multiple regression model is used to investigate the relationship between labour productivity and several independent variables, namely, number of workers, economic openness, technology, FDI, foreign workers, dummy capital-intensive industry, dummy FDI interaction with capital intensive -industry and dummy time.

To estimate the labour productivity equation, several models can be used, namely, pooled least square model, fixed effect model and one or two-way random effect models. To select the most suitable model with this set of data, a redundant fixed effect test is performed (Saadiah Mohammad et al. 2008). Nevertheless, the analysis will only select between the pooled least square model and fixed effect model because the random effect model cannot be used, as the number of cross sectional are less than the number of independent variables. In the analysis, there are six cross sectionals (based on type of sub-industry) and 9 independent variables. To choose the best model between the pooled least square model and the fixed effect model, the F-test is conducted with the following null hypothesis and alternative hypothesis:

\[ H_0: \text{Pooled Least Square Model is better} \]
\[ H_1: \text{Fixed Effect Model is better} \]

The F-statistical value is calculated as follows (Greene 2003: 562):
If the F-statistical value is significant, then the best model is the fixed effect model and vice versa. Estimation of the labour productivity model is done based on the Cobb Douglas production function. The function can be written as follows:

\[ Y = AK^{\beta_1}L^{\beta_2} \]  

where \( Y \) is total output, \( A, \beta_1, \) and \( \beta_2 \) are parameters, \( K \) is value of capital stock and \( L \) is number of labour. If we assume constant returns to scale (CRS), then \( \beta_1+\beta_2 = 1 \). But if we assume non-constant returns to scale, then \( \beta_1+\beta_2 \neq 1 \), with two possible conditions, either \( \beta_1+\beta_2 > 1 \) which reflects increasing returns to scale (IRS) or \( \beta_1+\beta_2 < 1 \) which reflects decreasing returns to scale (DRS). Dividing equation (1) by \( L \), we derive labour productivity model as follows,

\[ \frac{Y}{L} = AK^{\beta_1}\frac{L^{\beta_2}}{L} = AK^{\beta_1}L^{\beta_2-1} \]  

or,

\[ \frac{Y}{L} = A\left(\frac{K}{L}\right)^{\beta_1}L^{\beta_1+\beta_2-1} \]  

In the logarithm form, equation (3) can be rewritten as:

\[ \ln\left(\frac{Y}{L}\right) = \ln A + \beta_1 \ln\left(\frac{K}{L}\right) + \left(\beta_1 + \beta_2 - 1\right)\ln L \]  

Adding the globalisation indicators to equation (4) and splitting labour into local and foreign, we derive,

\[ \ln\left(\frac{Y}{L}\right)_{it} = \ln A + \beta_1 \ln\left(\frac{K}{L}\right)_{it} + \left(\beta_1 + \beta_2 - 1\right)\ln LL_{it} + \ln FL + \beta_3 \ln OPEN_i + \beta_4 \ln T_i + \beta_5 \ln FDI_i + \gamma_1 D_{it} + \gamma_2 D_{it} FDI_i + \gamma_3 D_2 + \epsilon_i \]  

where \( Y/L \) is labour productivity, which is the total gross nominal output of the manufacturing sector divided by the number of workers. \( K/L \) is the capital–labour ratio that is the value of nominal capital owned by firms divided by the number of workers in the manufacturing sector. \( L \) is the number of workers in the manufacturing sector, \( LL \) is local labour and \( FL \) is foreign labour. Data for these three variables are collected from the Manufacturing Industrial Survey, Department of Statistics Malaysia.

KE is the level of economic openness measured by the ratio of nominal value of export plus import in the manufacturing sector and nominal output for the manufacturing sector. Data is collected from the Ministry of International Trade and Industry (MITI). FDI is the value of nominal foreign direct investment for the manufacturing sector based on the total projects approved by the Malaysian Industrial Development Authority (MIDA). \( T \) is the transfer of technology measured by the number of technology agreements between the government and the foreign investors. The data is collected from MIDA. PA is the number of foreign workers in the manufacturing sector. The data is collected from the Ministry of Home Affairs, Malaysia.

Meanwhile, \( i \) is the sub-industries comprising six selected groups based on their contribution to gross output. They are the production, processing and freezing meat, fish, fruits, vegetables, oil and...
fat (MSIC 151), manufacturing sieved petroleum products (MSIC 232), manufacturing chemical base products (MSIC 241), manufacturing iron base and metal (MSIC 271), manufacturing office equipment, accounting and calculators (MSIC 300) and manufacturing valves and electronic tubes and other electrical components (MSIC 321). Lower-case \( t \) indicates time. \( D1 \) is the dummy variable for industry, 1 implies capital intensity, that is, when the capital-labour ratio is more than the average value; 0 implies labour intensity. \( D1FDI \) is the interaction term between FDI and the capital-intensive industry. \( D2 \) is time dummy variable, 1 implies the period after 1995, and 0 implies the period before 1995.

4. Results

Table 1 shows descriptive statistics of the variables. It shows that from 1985 to 2008 the annual average labour productivity is RM 11,646 and the capital-labour ratio has an average annual value of RM 5,553.192. The average number of workers is 54,941 and the average value of FDI is RM 14.4 million. For the economic openness, the average value is 1.516181 and the average number of technology agreement is 825.33.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>s.d.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y/L (RM)</td>
<td>11646.32</td>
<td>577.19</td>
<td>18908.98</td>
<td>93.67</td>
<td>3249.08</td>
<td>144</td>
</tr>
<tr>
<td>K/L(RM)</td>
<td>5553.19</td>
<td>156.41</td>
<td>4760.21</td>
<td>19.45</td>
<td>841.93</td>
<td>144</td>
</tr>
<tr>
<td>L (Number)</td>
<td>54941.78</td>
<td>22738.00</td>
<td>334013.5</td>
<td>1077.91</td>
<td>72614.42</td>
<td>144</td>
</tr>
<tr>
<td>FDI(RM'000)</td>
<td>14383.24</td>
<td>13107.01</td>
<td>46098.77</td>
<td>959.29</td>
<td>9668.871</td>
<td>144</td>
</tr>
<tr>
<td>FL (Number)</td>
<td>214053.2</td>
<td>132200.1</td>
<td>733372.0</td>
<td>7202.00</td>
<td>221397.4</td>
<td>144</td>
</tr>
<tr>
<td>OPEN (Ratio)</td>
<td>1.516181</td>
<td>1.508879</td>
<td>1.657013</td>
<td>1.38224</td>
<td>0.063702</td>
<td>144</td>
</tr>
<tr>
<td>T (Number)</td>
<td>825.3333</td>
<td>857.0000</td>
<td>1101.000</td>
<td>333.0000</td>
<td>176.7990</td>
<td>144</td>
</tr>
<tr>
<td>D1</td>
<td>0.500000</td>
<td>0.500000</td>
<td>1.000000</td>
<td>0.000000</td>
<td>0.501745</td>
<td>144</td>
</tr>
<tr>
<td>D1FDI</td>
<td>4.650253</td>
<td>3.433098</td>
<td>10.73854</td>
<td>0.000000</td>
<td>4.707763</td>
<td>144</td>
</tr>
<tr>
<td>D2</td>
<td>0.583333</td>
<td>1.000000</td>
<td>1.000000</td>
<td>0.000000</td>
<td>0.494727</td>
<td>144</td>
</tr>
</tbody>
</table>

In estimating the model, we come across with the problem of auto-correlation judging from a very low Durbin-Watson value. To overcome this problem, we estimate the model using auto-regressive (AR) approach. Apart from this, we perform the White- test and the results show the estimation has a problem of heteroskedasticity, therefore, the models are estimated using the weighted least square regression.

From Table 2, it is shown that the p-value in the redundant fixed effect test for all models are insignificant at the 5% significance level. Therefore, the pooled least square model is more appropriate to be used in the analysis.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Cross-section F-Statistics</th>
<th>Degree of Freedom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1.4820</td>
<td>5,120</td>
<td>0.2007</td>
</tr>
<tr>
<td>II</td>
<td>0.8807</td>
<td>5,119</td>
<td>0.4964</td>
</tr>
<tr>
<td>III</td>
<td>0.7262</td>
<td>5,124</td>
<td>0.6051</td>
</tr>
<tr>
<td>IV</td>
<td>0.7862</td>
<td>5,117</td>
<td>0.5616</td>
</tr>
<tr>
<td>V</td>
<td>0.7168</td>
<td>5,116</td>
<td>0.6121</td>
</tr>
<tr>
<td>VI</td>
<td>0.6980</td>
<td>5,115</td>
<td>0.6261</td>
</tr>
</tbody>
</table>

Table 3 below shows the results of the labour productivity regression equation.
Model 1 is the constant returns to scale (CRS) model. In this model the R\(^2\) is 0.94, which means that 94% of the variation in labour productivity can be explained by the independent variables. Coefficient for the capital-labour ratio is positive and significant in influencing labour productivity. A one percent increase in the ratio will increase labour productivity by 0.6430 percent.

<table>
<thead>
<tr>
<th>Variable (Loglinear Function)</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3.4641</td>
<td>24.5363</td>
<td>33.3448</td>
<td>32.8650</td>
<td>36.2771</td>
<td>37.0487</td>
</tr>
<tr>
<td>(5.1127)***</td>
<td>(2.0586)**</td>
<td>(0.7995)</td>
<td>(1.2599)</td>
<td>(0.3051)</td>
<td>(0.9708)</td>
<td></td>
</tr>
<tr>
<td>K/L</td>
<td>0.6430</td>
<td>0.0611</td>
<td>0.0777</td>
<td>0.0766</td>
<td>0.0753</td>
<td>0.0759</td>
</tr>
<tr>
<td>(8.2912)***</td>
<td>(0.8929)</td>
<td>(1.2315)</td>
<td>(1.2735)</td>
<td>(1.1811)</td>
<td>(1.1767)</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>-0.9478</td>
<td>-0.9296</td>
<td>-0.9294</td>
<td>-0.9247</td>
<td>-0.9264</td>
<td>-0.9264</td>
</tr>
<tr>
<td>FDI</td>
<td>-0.0890</td>
<td>-0.1050</td>
<td>-0.1222</td>
<td>-0.1149</td>
<td>-0.1149</td>
<td>-0.1149</td>
</tr>
<tr>
<td>FL</td>
<td>-0.0195</td>
<td>-0.0304</td>
<td>-0.0294</td>
<td>-0.0294</td>
<td>-0.0294</td>
<td>-0.0294</td>
</tr>
<tr>
<td>OPEN</td>
<td>-0.2354</td>
<td>-0.2031</td>
<td>-0.2031</td>
<td>-0.2031</td>
<td>-0.2031</td>
<td>-0.2031</td>
</tr>
<tr>
<td>T</td>
<td>-0.0332</td>
<td>-0.3306</td>
<td>-0.3306</td>
<td>-0.3306</td>
<td>-0.3306</td>
<td>-0.3306</td>
</tr>
<tr>
<td>D1</td>
<td>-0.3474</td>
<td>0.4372</td>
<td>-0.2900</td>
<td>-0.2907</td>
<td>-0.3420</td>
<td>-0.3646</td>
</tr>
<tr>
<td>(-0.4593)</td>
<td>(0.9145)</td>
<td>(-0.5398)</td>
<td>(-0.8775)</td>
<td>(-1.0529)</td>
<td>(-1.0950)</td>
<td></td>
</tr>
<tr>
<td>D1FDI</td>
<td>0.0373</td>
<td>-0.0611</td>
<td>0.0250</td>
<td>0.0249</td>
<td>0.0299</td>
<td>0.0320</td>
</tr>
<tr>
<td>(0.4647)</td>
<td>(-1.2032)</td>
<td>(0.4346)</td>
<td>(0.6711)</td>
<td>(0.8341)</td>
<td>(0.8865)</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>0.0110</td>
<td>0.1416</td>
<td>0.1113</td>
<td>0.1376</td>
<td>0.1695</td>
<td>0.1689</td>
</tr>
<tr>
<td>(0.0871)</td>
<td>(1.6903)**</td>
<td>(1.4533)***</td>
<td>(4.8762)***</td>
<td>(4.8582)***</td>
<td>(4.3003)***</td>
<td></td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.946</td>
<td>0.975</td>
<td>0.976</td>
<td>0.976</td>
<td>0.976</td>
<td>0.976</td>
</tr>
<tr>
<td>R(^2)-Adjust.</td>
<td>0.944</td>
<td>0.974</td>
<td>0.975</td>
<td>0.974</td>
<td>0.974</td>
<td>0.974</td>
</tr>
<tr>
<td>N</td>
<td>132</td>
<td>132</td>
<td>132</td>
<td>132</td>
<td>132</td>
<td>132</td>
</tr>
</tbody>
</table>

Note: 1. Numbers in brackets are t-values; for equations IV, V and VI, L is local labour.
2. *, **, *** indicate significance at the level of 10%, 5% and 1%, respectively.

Models II to VI are labour productivity equations with the assumption of non-constant return to scale. The value of R\(^2\) is more than 0.97. The results show that the capital-labour ratio becomes insignificant but labour coefficient is negative and significantly affect labour productivity at a one percent significance level. A one percent increase in the number of local workers causes labour productivity to decrease by 0.9247 to 0.9296 percent. In addition, an increase in FDI causes a fall in labour productivity significantly. When the variable D1 and D1FDI are dropped from the model, the result still shows a significant and negative effect of FDI on labour productivity at 10 percent significance level. This implies that the entry of foreign investors together with technology and expertise has lowered labour productivity in the manufacturing sector in Malaysia due the fact that technology differences are wider between the local and the foreign firms. The result concurs with the study by Kathuria (1998) which shows that to increase labour productivity, the technology gap between the domestic firms and the foreign firms must be narrowed.

Foreign labour also gives a significant negative impact on labour productivity. Nevertheless, the impact is low and only significant in model V. On the other hand, economic openness and technology agreements do not give any significant impact on labour productivity. Similarly, foreign investors in the capital-intensive industry do not give a different impact on labour productivity.
compared to those in the labour-intensive industry. However, years after 1995 have greater impact on labour productivity in the Malaysian manufacturing sector.

5. Conclusion and Policy Implications

FDI inflow that brings technology and expertise from the country of origin is not successful in enhancing but rather reducing labour productivity in the Malaysian manufacturing sector. One of the prevalent problems is the existence of too many semi-skilled workforces in the manufacturing sector especially from abroad, which limit its capability to absorb new technology. Therefore, the government needs to encourage and enhance the technology transfer through upgrading skills among the workers. The application of new technology in the manufacturing sector is crucial to enhance production and labour productivity.

Policy makers have a role to ensure that priority is given to enhance quality of education and training opportunities especially in the science and information technology field that can be adapted to suit the current industry needs. Creation of the high quality labour will enhance FDI related technology and expertise absorption that will eventually lead to a more advanced domestic technology development. Our policy makers should also need to ensure the creation of a more quality oriented education and training especially in the field of science and information technology. Educationists are to ensure that co-curriculum education is relevant to the industry needs of the country. Consequently, one relevant mechanism is to ensure that there is a bond among the institutions of higher learning, industry and research centres so that transfer and exchange of up-to-date information technology is efficient, smooth and constantly on-going among the players. At the same time, the industry also needs to support the research centres and the institutions of higher learning to reduce the paradigm problem of mismatch of workers and employee needs.

To ensure and encourage the high labour productivity achievement in the manufacturing sector, relevant policies related to knowledge must be formulated an incentive to encourage investment in human capital, technology and innovation. Besides that, emphasis on the manufacturing sector is crucial as this sector plays an important role in contributing highly towards national income and economic growth. Recruitment of foreign semi-skilled and unskilled labour must be reduced to avoid a decrease in labour productivity as the result shows that an increase in the number of foreign labour will reduce labour productivity. The domestic skilled workers must replace the semiskilled and unskilled foreign workers. Hence, this strategy will subsequently promote capital-intensive industry that produces higher value added to this country.

References


