

The Impact of Foreign Direct Investment on the Productivity of Manufacturing Firms in Cameroon

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Abstract

This paper attempts to evaluate the impact of Foreign Direct Investment (FDI) on the productivity of manufacturing firms in Cameroon. To do so, a Cobb-Douglas type production function was estimated using the Generalized Least Squares method for 1,269 enterprises in 24 branches of the country's industrial sector. Data obtained from the country's National Institute of Statistics, for the period spanning from 2005 to 2011 was used in the econometric estimations. The findings show that FDI has a negative impact on the productivity of manufacturing firms. A 1% increase in the productivity of foreign companies leads to a 4.4% reduction in that of domestic firms. Also, a 1% increase in multinational enterprises reduces the sales growth of domestic firms by 0.10%. From the findings, it is recommended that: first, domestic companies should invest more in research and machinery to reduce production cost and improve the quality of their products. Second, the government of Cameroon should facilitate the acquisition of technology and innovations for its home industries.

Keywords: Foreign Direct Investment, Productivity, Manufacturing Firms, Cameroon

1. Introduction

The development of African countries in general and Cameroon in particular has to be catalyzed by industrialization. Industrialization is very essential in alleviating poverty and harnessing economic development. A viable and competitive industrial sector is critical in modernizing and diversifying an economy, creating more wealth, increasing employment, augmenting exports and enhancing the integration of an economy in the world market. However, developing countries find it very difficult to generate the necessary resources needed for their development. This is partly explained by their limited access to international credit. It is in this regard that most of them increasingly resorted to Foreign Direct Investment (FDI) since the 1980s, thereby making it one of the most privileged ways to finance investments in developing countries. Unlike other forms of international finance, FDI is less volatile, thus preventing economic crises in the host country that could result from financial fluctuations on the international financial market (Aghion and Jaravel, 2015). Furthermore, FDI encompasses more advanced technologies, edge-cutting innovations, and skilled labor from which the host country's firms can benefit to improve their production and competitiveness (Acs et al., 2012). Also, positive externalities that might flow from multinational enterprises (MNEs) to domestic firms could constitute a non-negligible technological base in the host country given that the technologies are well exploited, adapted and reproduced (Bascavusoglu-Moreau and Li, 2013). This paper therefore attempts to evaluate the impact of Foreign Direct Investment on the productivity of manufacturing firms in Cameroon. The rest of the work is structured as follows: section 2 looks at the theoretical impact of FDI on firms; section 3 presents the empirical evidence of FDI impact on domestic enterprises; section 4 presents the methodology; section 5 discusses findings, section 6 concludes the paper.

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2. The theoretical impact of FDI on firms

FDI is susceptible to impact firms in many ways. Some of which include: demonstration, imitation and contagion effect, increased mobility of skilled labor, increased exports, increased competitiveness, and technology transfer.

2.1. Demonstration, imitation and contagion effect

The demonstration effect of a multinational corporation and the imitation by local firms is probably one of the most evident canals of benefiting from FDI (Das, 1987; Wang and Blomström, 1992). Previous studies, particularly those of Arrow (1971) and Findlay (1978) on the diffusion of technology by FDI emphasized on the contagion effect emanating from multinational corporations. These studies considered technology as a disease that is spread through human contact. They underlined that technological innovations, for example, are copied more efficiently when there is a physical contact between the holder of a technology and its potential adopter. In this regard, FDI serves as a canal to transfer technology as there are most often contacts between foreign companies and domestic firms via supply, demand, and maintenance contracts.

The purchase or acquisition of a new technology on the market might be difficult for some local firms due to limited financial resources, and to some extent insufficient skilled labor to optimally utilize the technology. It is in this light that some multinational enterprises in the quest to ameliorate the supply of raw material and the delivery finished product facilitate the acquisition and use of new technologies to their domestic partners by putting the technologies and at their disposal. Also, foreign companies sometimes train the staff of their domestic partners on how to use the technologies (Barrios and Strobl, 2002). Domestic firms could equally imitate or copy new or better business organization methods from their foreign counterparts to reduce bureaucracy and improve their efficiency and effectiveness (Blomstrom and Kokko, 1998; Javorcik, 2004). In short, FDI enables local firms to acquire technologies or improve theirs through the processes of learning by watching, learning by using and learning by doing (Kumar, 1996).

2.2. Increased mobility of skilled labor

Mobility of labor here is when a domestic firm hires or recruits a more qualified staffs who had worked or still working for a multinational corporation with a higher level of technology, and eventually apply their skills, knowledge and technology in the domestic firm (Fosfuri et al., 2001; Verre and Saggi, 2002). This is common when there are projects and/or investments jointly realized by local and foreign enterprises or when a foreign firm leaves the host country and the domestic firm recruits the workers it hired.

Most often, multinational corporations recruit the most skilled workers on the labor market because they offer relatively high wages and better working conditions (Sinani and Meyer, 2004). This sometimes pushes local enterprises to improve the working conditions and also increase the wages of their workers to limit the loss of skilled labor to foreign firms. In addition, local firms can offer frequent trainings for their personnel to improve their skills so as to be more productive (Blomstrom and Kokko, 1998; Javorcik, 2004). In fact, curbing the loss of skilled labor by domestic firms to multinational corporations, particularly those abroad can enable the local economy to build a pool of highly skilled labor that could be recruited at all levels of the economy (Caves, 1974; Aitken and Harrison, 1999; Haskel et al., 2002).

2.3. Increased exports

The economic success of the newly industrialized countries of Asia in the 1970s and 1980s underscores the importance of export performance in the economic development process of a nation. MNEs indirectly improve the export capacity of domestic firms, particularly when they follow the export processes of the former through imitation and collaboration in sub contracting or the supply of raw materials (Rhee, 1990; Aitken et al., 1997; Kokko et al., 2001). Interacting and competing with MNEs on the domestic market can enable them to improve the quality of their products to meet the required international standards. This would ease and enhance the access of domestic firms to the international market and as such they would export more of their produce because they are already acquainted with international norms by interacting and competing with MNEs (Aitken et al., 1997; Greenaway et al., 2004).

2.4. Increased competitiveness

FDI has the potential to improve the competitiveness of domestic firms through its effect on competition. Competition from MNEs can negatively affect home enterprises in case they lose part of their market shares and their existence threatened by foreign entrants (Wang and Blomström 1992, Markusen and Venables, 1999). In short, the presence of MNEs puts competitive pressure on domestic firms which compels them to become more efficient and competitive by modernizing and streamlining their production processes (Sjöholm, 1999).

Competition between MNEs and domestic firms mounts pressure on the latter to optimally utilize their resources and technology so as to produce quality products in large volumes at a lower cost. Nonetheless, in most cases, the presence of MNEs weakens domestic enterprises as well as their capacity to absorb the technologies emanating from FDI. As such, any inefficiencies of domestic firms would be a hard blow to them because they can lose a significant part of their market shares to their foreign counterparts (Harrison, 1994; Aiken and Harrison, 1999). So, they have a permanent pressure to improve their competitiveness. In short domestic firms have to be competitive or they perish.

2.5. Transfer of technology

In most countries, multinational corporations train the local workforce they recruit to meet the exigencies of the work they are to do for the foreign companies. They also train the personnel of their partners upstream and downstream to reduce delivery time and cost among other things. By so doing, MNEs transfer techniques, technologies, methods, innovations and marketing strategies to local enterprises.

However, the sectors in which MNEs operate greatly determine the qualification and number of workforce they seek, as well as the type of training they offer to the staff of their local partners. As such, the technological spillovers to domestic firms would vary from one sector to another (Girma et al., 2008). Also, the net technological effect of FDI on domestic enterprises depends on the technological gap between local firms and their foreign counterparts. The effect is positive when this gap reaches a minimum threshold that allows local firms to easily upgrade their technology and improve production.

3. Empirical evidence of FDI impact on domestic enterprises

Among the pioneer empirical works that focused on the analyses of the impact of MNEs on domestic firms include: Balasubramanyam (1973), Brash (1966), and Dunning (1970). In the literature, there are divergent views on the impact of FDI on the firms of host countries depending on the type of FDI, the sector to which it is directed, the absorptive capacity of local firms, the nature and structure of the host countries' economies, etc. For example, the works of Caves (1974) on the manufacturing sector of Canada concluded that FDI is beneficial to the host country. Globerman (1979) equally had the same views while looking at the effect of FDI on the manufacturing sector in Australia. Aitken and Harrison (1999) show that a 1% increase in foreign investment in Venezuelan firms increased their output by 0.1% between 1976 and 1989.

Additionally, a 10% increase in industrial workforce in Britain to respond to its industrial sector increased the Total Factor Productivity (TFP) in manufacturing firms by 0.5% between 1973 and 1992 (Haskel et al., 2007). It is worth noting that as in most countries, the training of workforce is partly financed by companies that invest in their staff to upgrade their capacities and skills in order to address possible challenges related to labor quality.

In Lithuania, domestic firms benefited from the spillovers of FDI, and eventually improved their productivity (Javorcik, 2004). For instance, a 3% increase in the presence of MNEs downstream resulted to a 10% increase in the output of domestic firms. In addition, local enterprises benefited more from the presence of foreign affiliates oriented towards the local market than those oriented towards foreign markets (Girma et al., 2008).

Conversely, a 10% increase in investment by MNEs in an industry deteriorates the productivity of domestic firms by 2.67%. This shows that FDI has a negative impact on the TFP of domestic firms. Djankov and Hoekman (2000) underlined that a 10% increase in foreign investment leads to a 1.7% reduction in the productivity of domestic firms. While examining the responses of domestic firms to the presence of U.S. MNEs on the European market between 1955 and 1975, Cantwell (1989) pointed out that externalities are more likely to appear in regions that have endogenous technological bases that only need to be stimulated. Therefore, regions or countries with quasi inexistent technological bases would get little or nothing of the technological spinoffs from FDI.

Although the share of foreign capital is positively correlated to the productivity of some firms in developed economies, the presence of foreign companies negatively affects the productivity of most domestic firms in developing countries because of their inability to compete. Moreover, Aitken and Harrison (1999) used data from 4,000 companies in the Venezuelan industrial sector for the period 1976-1989 and found no evidence that supports the existence of technological externalities emanating from FDI to the local economy.

Nonetheless, FDI might have positive effects on the enterprises of developing countries. Haddad and Harrison (1993) examined data on the Moroccan manufacturing industry between 1985 and 1989 and concluded that the presence of foreign capital in low-tech industries leads to high levels of TFP. They however added that there is no significant correlation between productivity growth of domestic firms and a significant presence of MNEs in the manufacturing sector in protected markets. Thus, the technological spillovers of FDI to domestic firms are limited when the technological gap between MNEs and domestic firms is wide. This gap might widen if foreign companies find no interest in disseminating part of their technology to the host country's firms (Kokko, 1994 and 1996). In Poland, for instance, domestic firms benefited substantially in terms of technological spinoffs from MNEs because of their relatively high absorptive capacity Marcin (2008). This was equally the case in the countries of the Organization for Economic Cooperation and Development (Bitzer et al., 2008).

Generally, the presence of MNEs in the host country affects domestic firms horizontally and vertically. Some authors argue that this presence negatively affects the productivity of domestic firms in the same industry in developing and emerging countries (Aitken and Harrison, 1999; Haddad and Harrison, 1993). However, the type and magnitude of the effects depend on the absorptive capacity of domestic firms and their links with foreign firms (Girma et al., 2008). In developed countries, FDI brings in more benefits to domestic enterprises (Keller and Yeaple, 2003). Thus, the benefits are reaped by firms that have the required minimum threshold in terms of human capital, infrastructure, and technological base (Borensztein et al., 1998).

4. Methodology

4.1. Model

An augmented Cobb-Douglas type production function was used to evaluate the impact of FDI on the productivity of Cameroon's manufacturing firms. This production function is employed because it encompasses the factors capital and labor to which it could be added other inputs to produce a given good or service. Moreover, the Generalized Least Squares method was used to estimate the production function as it enables the correction of any possible bias in the estimates.

The production function that will be used is defined as follows:

$$Y_{ijt} = A_{ijt} F(K_{ijt}, L_{ijt}, M_{ijt}) \quad (1)$$

Where:

i represents the companies;

j stands for the different branches of the industrial sector;

t is time index.

It is assumed that the production function is homogeneous of degree *g* and the factors of production can be substituted.

A_{ijt} is used to measure the TFP which can be determined by factors like managerial performance, organizational skills, research and development, technical progress, and the diffusion of technology (Felipe, 1999). TFP is therefore considered to be dependent on the other variables of the production function (Haddad and Harrison, 1993; Sjöholm, 1999; Zukowska-Gagelman, 2000; Kinoshita, 2001).

By differentiating equation (1), the following equation is derived.

$$\begin{aligned} dY_{ijt}/Y_{ijt} = & dA_{ijt}/A_{ijt} + \left[d \log(Y_{ijt})/d \log(K_{ijt}) \right] * dK_{ijt}/K_{ijt} + \left[d \log(Y_{ijt})/d \log(L_{ijt}) \right] * dL_{ijt}/L_{ijt} \\ & + \left[d \log(Y_{ijt})/d \log(M_{ijt}) \right] * dM_{ijt}/M_{ijt}, \quad (2) \end{aligned}$$

Where:

dY_{ijt} , dA_{ijt} , dK_{ijt} , dL_{ijt} and dM_{ijt} are the derivatives of equation (2) in time.

Moreover, $d \log(Y_{ijt})/d \log(Z_{ijt})$ is equal to b_{yz} , with Z_{ijt} standing for either capital (K_{ijt}), employment (L_{ijt}) or material (M_{ijt}) such that b_{yz} be the elasticity of a given output.

By replacing the variables in equation (2) above, the following equation is obtained.

$$dY_{ijt}/Y_{ijt} = dA_{ijt}/A_{ijt} + b_{yk} * dK_{ijt}/K_{ijt} + b_{yl} * dL_{ijt}/L_{ijt} + b_{ym} * dM_{ijt}/M_{ijt} \quad (3)$$

Equation (3) can be rewritten as follows:

$$\log(Y_{ijt}/Y_{ijt-1}) = dA_{ijt}/A_{ijt} + b_{yk} * \log(K_{ijt}/K_{ijt-1}) + b_{yl} * \log(L_{ijt}/L_{ijt-1}) + b_{ym} * \log(M_{ijt}/M_{ijt-1}) \quad (4)$$

Due to the characteristics of the selected enterprises in the manufacturing sector, the proxy variables (externalities) and a dummy variable characterizing the enterprises of the sample will be integrated in equation (4) to obtain the final equation.

The proxy variables for FDI are:

- $IDEE_{jt}$, employment offered by FDI with respect to the total number of jobs in the industrial sector;
- $IDEK_{jt}$, capital brought in by FDI with respect to the total capital in the manufacturing sector;
- $IDEV_{jt}$, sales of foreign firms with respect to the total sales made by all enterprises in the manufacturing sector.

Thus, the final model to be estimated is given by the augmented linear logarithmic production function below:

$$\log(Y_{ijt}/Y_{ijt-1}) = \alpha + \beta_{yz} \sum_{k=1}^K \log X_{Kit} + b_z \text{Externalities}_{it} + \varepsilon_{it} \quad (5)$$

$i = 1, \dots, 1269$, $t = 2005, \dots, 2011$, and $j = 1, \dots, 24$;

$\log(Y_{ijt}/Y_{ijt-1})$ represents the productivity of enterprises;

X_{Kit} denotes the matrix of explanatory variables;

$\text{Externalities}_{it}$ stands for the various variables that enable to measure the presence of foreign firms;

ε_{it} is the random variable.

4.2. Data and variables

The data used in this work were obtained from the database of Cameroon's National Institute of Statistics for the period spanning from 2005 to 2011 for 1,269 enterprises selected from 24 branches in the country's industrial sector. The period and the number of enterprises under study are justified by the availability and continuity of data. The explained variable is the productivity of enterprises. The explanatory variables are: FDI externalities by branch, capital, material, labor (skilled and unskilled), and dummies (in time and by branch). Moreover, the variables in the sample are deflated by the many factors GDP deflator for the selected period in order to eliminate the inflation effect.

Table 1: Descriptive statistics of variables

Variables	Observations	Means	Standard deviation	Minimum	Maximum
Ln Production	2615	16.831	2.910	3.800	25.043
Ln Capital	2617	23.267	2.158	18.293	28.102
Ln Material	2594	17.978	2.803	8.325	27.274
Ln MOQ	2617	2.461	1.620	0.000	8.009
Ln MONQ	2617	2.791	1.705	0.000	9.480
IDEK	2617	0.265	0.193	0.000	1.000
IDEE	2615	0.439	0.301	0.000	1.000
IDEV	2604	0.485	0.328	0.000	1.000

Note: MOQ: Skilled labor; MONQ: Unskilled labor; IDEK: Capital externality; IDEE: Employment externality; IDEV: Sales externality.

5. Results and discussions

The results will be presented in two parts. The first part will present the direct impact of FDI on the productivity of domestic enterprises and part two will focus on the indirect impact of FDI on the productivity domestic enterprises.

5.1. Direct impact of FDI on the productivity of domestic enterprises

The results are presented in the table below.

Table 2: Direct impact of FDI on the productivity of domestic enterprises

Variables	Coefficients
Dum	-4.4023** (1.7361)
Capital	0.0921 *** (0.0078)
Material	0.4329 *** (0.0083)
Skilled labor	-0.0585 *** (0,0116)
Unskilled labor	-0.0076 (0.0117)
Constant	-5.4299 (3 8198)
Dumyear	Yes
Dumsector	Yes
Wald χ^2 (33)	6491.38
p-value Wald χ^2	0.0000
Number of observations	1085
Number of groups	542

Note : * signifies coefficient significant at 10% ; ** significant at 5% ; *** significant at 1%. Standard deviations are in parentheses.

The results in table 2 above show that FDI has a negative impact on domestic firms. This implies that domestic firms do not benefit from the direct contact with foreign companies. Since the dummy variable measuring FDI is statistically significant and negative, foreign firms are therefore more efficient than their domestic counterparts. These results affirm the dominance of MNEs over domestic firms. According to these results, a 1 % increase in the productivity of foreign companies leads to a 4.4% reduction in that of domestic firms. These results confirm that the entry of foreign firms into the domestic market increases competition with those of the host country that are generally vulnerable to shut down or lose a great proportion of their market shares to the new entrants (Wang and Blomstrom, 1992; Glass and Saggi, 2002). The inability of domestic firms to compete with MNEs is principally because of their inefficiency, low level of technology and innovations, and limited capital to invest in research. In general, MNEs are bigger than domestic firms, especially in developing economies in Sub Saharan Africa. The MNEs employ almost four times the number of employees in domestic firms. As a result, inefficient domestic enterprises exit the market, thereby creating unemployment, reducing the purchasing power of those they employed, contracting government tax revenues, etc. Also, foreign companies tend to engulf most of the qualified labor as they offer relatively high wages, leaving domestic firms with more of unskilled and less qualified workforce. This contributes to the ineffectiveness of local firms as highlighted by the significant and negative coefficient of skilled labor coefficient at 1%.

5.2. Indirect impact of FDI on the productivity of domestic firms

The indirect impact of FDI on the productivity of domestic firms are summarized in the following table.

Table 3: Indirect impact of FDI on the productivity of domestic enterprises

Variables	Coefficients
Capital	0.0945 *** (0.0123)
Material	0.4568 *** (0.0091)
Skilled labor	-0.1253 *** (0.0141)
Unskilled labor	-0.0162 (0.0135)
IDEK	0.0269 (0.0868)
IDEE	0.2247 ** (0.0935)
IDEV	-0.1085 * (0.0571)
Dumyear	Yes
Dumsector	Yes
Constant	20.8993 (23.2697)
Wald χ^2 (31)	12988.19
p-value Wald χ^2	0.0000
Number of observations	768
Number of group	425

Note: * signifies coefficient significant at 10%; ** significant at 5%; *** significant at 1%. Standard deviations are in parentheses. IDEK: Capital Externality; IDEE: Employment Externality; IDEV: Sales Externality.

The presence of MNEs negatively affects the sales of domestic firms. The results obtained suggest that a 1% increase in MNEs decreases the sales growth of domestic firms by 0.10%. This is partly explained by the huge financial resources, advanced technologies and great marketing strategies of MNEs. Also, regardless of the sector of activity, MNEs operate in more integrated sophisticated networks that enable them to obtain production enhancing information, technology and equipments in shorter periods at lower costs. In addition, they have research centers and improve the quality of their products very often. The coefficient of skilled labor is statistically significant and negative. This implies that a 1% increase in the skilled labor rate leads to a 0.12% decrease in the productivity rate of domestic firms. This reflects the inefficiency in the use of factors of production in the industrial sector. Another explanation for this sign could be the absorption of human capital by MNEs at the detriment of domestic firms.

6. Conclusion

Industries play a crucial role in the production of goods and services, creation of job opportunities, and transformation of economies. Today, the level of economic development of a country is most often reflected by the modernity and performance of its industrial sector. As such, many countries the world over strive to improve their industrial sectors either by investing more or attracting FDI, which is assumed to bring in new technologies, innovations, create more jobs, and so on. In short, countries attract FDI to benefit from its spillovers. In the quest to improve its economy, Cameroon attracted MNEs to its industrial sector. It is in this regard that this paper endeavored to evaluate the impact of FDI on the manufacturing enterprises in Cameroon. The results of the econometric estimations indicate that FDI adversely affect the country's enterprises. This partly explained by the industrial inability of the country's manufacturing firms to compete, as well as the limited absorptive capacity of the economy which could enable it to significantly benefit from the spillover effects of FDI.

To this effect, it is recommended that: first, companies should invest more in research and machinery to reduce production cost and improve the quality of their products. Second, the government of Cameroon should facilitate the acquisition of technology and innovations by its home industries.

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