

# **Do Domestic Firms Learn to Export from Multinationals? Empirical Evidence from Cameroon**

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## **Abstract**

*Multinational Corporations (MNCs) have continued to be a major concern to most governments in developing countries due to the numerous benefits they can bring in terms of improved productivity, employment, technological research and development. In this paper, firm level data from the World Bank Investment Climate Survey (ICS) for the period 2006 and 2009 were used to investigate the effect of Multinational Corporations on the export performance of manufacturing firms in Cameroon. The paper specifically examined the channel through which Multinationals influence the export performance of manufacturing firms using the Heckman Two Stage Selection Technique. The empirical results provided evidence that MNCs influence the export performance positively through the demonstration, competition and information channels. The results however showed that the information channel was statistically insignificant in influencing the likelihood to export. The paper therefore recommended that policies aimed at promoting a good business climate such as stable political and macroeconomic environment, improved security should be encouraged to attract more MNCs in an attempt to improve the export performance of domestic firms.*

**Keywords:** Multinational Corporations, Export, Manufacturing Firms, Cameroon

**JEL Classification:** F10, F14, F23

## **1. INTRODUCTION**

The increasingly role of multinational enterprises or Corporations (MNCs) in the global economy is the focus of much attention. This is linked to questions of how the foreign direct investment (FDI) they control influences the overall economic activity in the recipient countries. This has prompted trade policy reform by countries to involve extensive investment by governments in order to attract MNEs, partly because of a perceived link between MNEs and the improved export competitiveness of the host country, which has a multiplier effect of influencing the general economic environment and growth. As a matter of fact, MNEs are considered to be owners of superior firm specific assets that they cannot completely protect from spilling over to local firms. This probably explains the increasing number of transnational investment in the form of FDI flows.

The United Nations (1992) reports that by 1990, the total number of transnational corporations exceeded 35,000 with more than 150,000 foreign affiliates. The growth in number has been accompanied by a massive outpouring of FDI. The total stock of FDI stood at 1.7 trillion dollars with annual flows in 1990 amounting to 225 billion dollars. In the 2001 report, it is observed that FDI inflows into the developing countries increased from 24 billion dollars in 1990 to 170 billion dollars in 1998 with China being the main recipient of FDI. According to UNCTAD (2002) FDI promotes exports of host countries in different ways among which include; augmenting domestic capital for exports, helping transfer of technology and new products for exports, facilitating access to new and large foreign markets, and providing training for the local workforce and upgrading technical and management skills. On the other hand, however, it is sometimes suggested that FDI may lower or replace domestic savings and investment; transfer technologies

that are low level or inappropriate for the host country's factor proportions; target primarily the host country's domestic market and thus not increase exports; inhibit the expansion of indigenous firms that might become exporters; and may not help in developing the host country's dynamic comparative advantages by focusing solely on local cheap labour and raw materials<sup>1</sup>. While further theoretical insights would be valuable, empirical analyses of the issue are needed as well for a better understanding of the FDI-export link.

This therefore prompts the study of MNCs and or FDI and their role in influencing performance to be of paramount importance to researchers and policy makers. Much effort have therefore been directed in this respect as reviewed in Agarwal (1980), Graham (1992), Lipsey (2002), Feenstra (2004) and Caves (2007). The literature on the linkage between MNCs and export try to investigate whether export spillovers exist and what is the transmission mechanisms from MNCs to domestic owned firms. In recent times, the literature on spillovers has acknowledged that exports could be an important source of spillovers. By their very nature they comprise a pure form of technology spillovers, since domestic firms may learn to export by interacting with foreign owned firms within the host country. According to Bernard and Jensen (1995) exporting firms usually perform better than domestic market oriented firms. In this regard, there has been a debate on whether successful firms export more or exporting lead to higher firm productivity. Two different but not mutually exclusive views have approached the issue in the literature - the first argues in favour of the self-selection of better firms into the export markets (Bernard and Jensen, 1999), while the other view favours the learning by exporting hypothesis (Van Biesebroeck, 2005).

The role played by MNCs or FDIs in influencing the export performance of domestic firms has not yet been fully embraced, until recently. In addition, studies that consider export spillovers differ in several important aspects, such as the definition of export spillovers and/or the level of data disaggregating causing econometric results to show mixed evidence. For instance, Greenaway and Kneller (2008) and Koenig et al. (2010) all find evidence of export spillovers from MNCs. On the other hand, Barrios et al. (2003) and Bernard and Jensen (2004) find no evidence of export spillovers. Other studies suggest that transmission effect from foreign to domestic firms in the host country depend on the characteristics of domestic firms and industries in terms of human capital participation, financial market development and the technology gap (Anwar and Nguyen, 2011). In addition, some studies (Gorg and Strobl, 2005) emphasized the importance of links that allow technological and pecuniary externalities from foreign investment to occur. The above mentioned review shows that reasonable attempts have been made to understand whether MNCs are a source of export spillovers, however the findings remain largely inconclusive. Moreover, few studies have devoted considerable attention in understanding the transmission channels of MNCs in developing economies like Cameroon.

In this endeavour, this paper examined the effect of MNCs on export performance of domestically owned manufacturing firms in Cameroon. Furthermore, the paper identified the various mechanisms or channels through which such effects can take place using firm level data for 2006 and 2009 collected by the World Bank.

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<sup>1</sup> See UNCTAD(2002). *World Investment Report 2002: Transnational Corporations and Export Competitiveness*.

The rest of the paper is organised as follows; the section on literature review makes an overview of the existing literature on MNCs and their transmission mechanisms on domestic companies, while the section on data description and empirical model presents the estimation methodology and describes the data used in the analyses. The empirical results on the effect of MNCs on export performance and its channels of transmission are presented and discussed in the section for presentation and discussion of results while the last section presents the conclusion and policy implications of the study.

## **2. Review of Literature**

The effect of MNCs and FDI and their spillover channels are typically classified into one of two categories according to their 'direction' -*horizontal (intra-industry spillovers)* and *vertical (inter-industry spillovers)*. According to Blyde, Kugler and Stein (2005), the main difference between them lies on the fact that the former is more likely to involve sector specific technical knowledge that would benefit competitors. Thus, there is greater incentive to prevent spillovers of this type. Possible channels through which such spillovers might occur are the acquisition of human capital (for instance Multinational Enterprises train local workers on specific production techniques, who may subsequently be hired by indigenous businesses taking the acquired human capital therein) and imitation (reverse engineering).

In terms of vertical spillovers, it concerns general rather than sector specific technological knowledge and would bring benefits to those firms in upstream industries (suppliers) and downstream industries (buyers) which foreign affiliates deal with. These firms represent stakeholders of the subsidiaries of Multinational Corporations (MNCs), not direct competitors, and therefore foreign affiliates may have some incentive to share general technological know-how with them, in order to achieve higher degree of co-ordination and automation in their production activities, and thereby higher profits. More specifically, backward and forward linkages between foreign affiliates and domestic suppliers and clients might involve design, procurement, market information and tooling.

The linkage between buyers and suppliers in foreign and domestic firms may be considerably important for spillovers as underlined by several authors. Dunning (1993) claimed that the incentive for foreign affiliates to share general technical knowledge with firms in upstream and downstream sectors with which they have business linkages may have effect on both the quantity and quality of the inputs supplied. Reviewing the literature to date he affirmed there was little doubt that foreign affiliates raise the quality of inputs produced and the productivity of suppliers.

Looking at the theories linking foreign and domestic enterprises, Rodriquez-Clare (1996) showed how linkages between foreign subsidiaries and indigenous firms may boost the productivity of the latter. Similarly, Markusen and Venables (1999) argued that contacts between domestic and foreign enterprises (supported by production complementarities and scale economies) may foster the development of domestic sectors with wider consequences for the host region and industry. They also linked vertical spillovers to market structure, while it is argued that backward spillovers may occur if foreign affiliates establish a supply arrangement to encourage competition in the upstream sector.

In terms of the empirical evidence studies on inter-industry and intra-industry spillovers have concentrated mostly on productivity. The findings on horizontal spillovers have not drawn any

conclusion as reviewed by Görg and Greenaway (2004). Moreover, some studies found negative horizontal productivity spillovers (Aitken and Harrison, 1999). This lack of evidence in support of positive productivity spillovers may be as a result of the fact that foreign affiliates are successful in avoiding leakage of sector-specific technical knowledge on which their success is based. However, in terms of vertical productivity spillovers, some studies have reported significant results (Smarzynska-Javorcik, 2004; Girma and Wakelin, 2002). These results corroborate the hypothesis that MNCs might have incentives in sharing generic technical knowledge with buyers and suppliers.

The above discussion clearly shows that few studies have concentrated on export spillovers as opposed to productivity spillover. This is supported by the review of Görg and Greenaway (2004) which showed 40 studies on productivity spillover as against five for export spillover. Moreover, the literature has focused attention exclusively on horizontal spillovers, although Aitken et al. (1997) add a regional dimension to these. The evidence from this approach is somewhat mixed. While the earlier literature identified strong positive spillover effects (Aitken et al., 1997; Greenaway et al., 2004) more recent studies have either found no and in some cases negative spillover effects (Ruane and Sutherland, 2005).

The inconsistencies in the results may be attributed to the differences in the country from which the underlying data are taken rather than from the methods used in the analyses. This is because almost all the studies used the same measure of foreign presence, the sum of employment or output in the industry. However, some mixed evidence exists. In a study by Aitken et al. (1997) using firm level data set of manufacturing plants in Mexico for the 1986-1989 period, their results showed that the probability to export by domestic firms increased with the concentration of exports from foreign firms operating in the same industry and region as domestic companies. This result was found to be robust to the inclusion of more variables and samples. In a similar study, Kokko et al. (2001) obtained results for Uruguay which showed that foreign firms established after 1973 (this period corresponds to the outward-oriented period of Uruguay) positively affected the likelihood to export by domestic firms.

Sjoholm (2003) used the sum of total FDI in the region to measure foreign presence in an attempt to assess the effect of FDI on the performance of manufacturing firms in Indonesia. This was because he was concern more with cross-industry spillovers. His results showed that for Indonesian manufacturing firms, FDI in the region had no significant effect on exports. In another study, using samples from European countries, Greenaway et al.(2004), Barrios et al. (2003) and Ruane and Sutherland (2005) reached contrasting conclusions. Greenaway et al. (2004) for the UK found that both the likelihood to export and the export share are increasing in the industry-level foreign presence index, even when controlling for firm level and industry level characteristics. They obtained results that were not very clear for the index measuring the export activities of foreign firms. The results were positive but weakly significant for the export decision and positive and insignificant in the decision of how much to export.

Greenaway et al. (2004) and Ruane and Sutherland (2004) adapted the same methodology for their studies of firms in Ireland. They found a positive effect from the employment share and a negative effect from the export share of foreign multinationals on both the export decision and the export share. They explained the latter results as being due to the use of Ireland as an export platform to the rest of the EU. They argued that export spillovers are unlikely where the country

is used as an export platform because competition with domestic firms in local product markets is limited.

### **3. Estimation Framework and Data Description**

The study used secondary data that were obtained from the firm-level World Bank Investment Climate Survey (ICS) data on companies. The data aimed at assessing the investment climate in the various countries. The firms are surveyed using questions designed to identify firm specific characteristics and factors that can promote and inhibit their activities. To facilitate the selection of firms in the sample, stratification of the firms is carried out to consider aspects such as the location, sector of operations, size of the firm, year of establishment, domestic and exports sales, domestic and imported raw materials, capacity utilization and value of utilities consumed, fixed assets and capital investment by nationality, detailed information on employees, research and expenditures. This study used an unbalance panel data collected for two years. It is unbalance because some companies could not be included in both surveys as shown in Table A1.

From Table A1, it is can be noted the survey included firms in the different sectors of operations giving a total observation of 535 data points. However, in this study focus is on the spillover effect on domestic manufacturing firms, consequently only 160 (83+77) data points are included. In terms of ownership, Table 1 also presents a breakdown of the dataset used for the two periods.

For the purpose of this study firms with at least 10 percent of their nominal capital owned by foreigners are defined as foreign owned firms, while the rest are considered as locally owned.<sup>2</sup> This definition as observed by De Mello (1997) is restrictive, because FDI comprises of bundles of capital stocks, know-how, and technology among other things which are not taken into account. Furthermore, firms today can exercise various forms of control over distance enterprises without direct ownership (Winder, 2006).

The mean values of different characteristics across all firms are presented in Table A2 while the correlation matrix for the different spillover variables is presented in Table A3 in the Appendix. From Table A3, the correlation between the spillover variables is not very high (ranging from 0.45 to 0.64). For cautious purposes and to avoid potential multicollinearity the variables are included separately in the estimations. In Table A2, a comparison is made between foreign and domestic firms. Furthermore, each group is categorised based on whether the firms participate in the export market or not. For all the firms, exporters have higher turnover, employment and average wages. They are also older compared to non-exporters. In addition, these firms are on average 9 years older than the non-exporting firms.

It can be further deduced from Table A2 that exporting firms (foreign or domestic owned) have higher average wages and employment compared to non-exporting firms. Domestic exporting firms however, have higher average wage compensation and labour cost than the exporting foreign owned firms. Foreign owned non exporting firms are also superior to domestic owned non exporting firms, except for the number of full time employees. They pay higher wages, have

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<sup>2</sup> This definition follows that adopted by OECD (1993). *Balance of Payments Manual: Fifth Edition* Washington, D.C., International Monetary Fund; UNCTAD (1996). *Detailed Benchmark Definition of Foreign Direct Investment*, 3<sup>rd</sup> Edition, Paris, OECD.

higher turnover and are slightly older. These descriptive results are very similar to the findings by Graner and Isaksson (2009) and Rasiah and Gachino (2005).

The empirical captured export behaviour using two elements viz, the decision to export and the proportion of output exported. The econometric analysis is thus framed to account for both elements and for the fact that they are interdependent, that is, decision to export influences the quantity of goods exported. This specification avoids selectivity biases associated with focusing exclusively on export propensity of exporting firms, which may cast doubt on econometric results.

The export decision or propensity equation is expressed as:

$$EXP_i = \alpha_0 + \alpha_1 WAGE_i + \alpha_2 TURN_i + \alpha_3 EXPER_i + \alpha_4 SIZE_i + \alpha_5 INSEC_i + \alpha_6 POWER_i + \alpha_7 RDF_i + \alpha_8 EMF_i + \alpha_9 EXF_i + \varepsilon_i \quad (1)$$

While the performance equation (export intensity or proportion equation) is stated as:

$$EXINS^* = \beta_0 + \beta_1 WAGE_i + \beta_2 TURN_i + \beta_3 EXPER_i + \beta_4 SIZE_i + \beta_5 INSEC_i + \beta_6 POWER_i + \beta_7 RDF_i + \beta_8 EMF_i + \beta_9 EXF_i + \gamma_i \quad (2)$$

$$\text{Where } EXINS \begin{cases} = 1 & \text{if } EXINS^* > 0, \text{ firm } i \text{ exports} \\ = 0 & \text{if } EXINS^* \leq 0, \text{ otherwise} \end{cases} \quad (3)$$

$\varepsilon_i \sim N(0,1)$ ;  $\gamma_i \sim N(0,\delta)$ ;  $corr(\varepsilon_i, \gamma_i) = \rho$  and  $(\varepsilon_i, \gamma_i) \sim$  bivariate normal  $(0, 0, 1, \delta, \rho)$ . The subscripts  $i$  and  $s$  refer to the firms and sectors respectively. Equation (1) estimates the probability to export using the sample of domestic manufacturing firms only. EXP is a dichotomous dependent variable, which takes the value of 1 if the firm exports and 0 otherwise. This equation also performs the sample selection for the second model that focuses exclusively on the export propensity of the subset of firms that do decide to export. The dependent variable in equation (2) is expressed in terms of the share of output exported, which is the proportion of total sales exported. The independent variables for the two equations are included to reflect firm specific heterogeneity, environmental and spillover factors. The firm specific variables are average wage (*WAGE*), turnover (*TURN*), size of the firm (*SIZE*), experience in the sector (*EXPER*) while the environmental variables are power outage (*POWER*) and insecurity (*INSEC*). The spillover variables used in this study are; relative weight of foreign owned firms in total employment in a given sector (*EMF*), proportion of foreign owned firms' export in a given sector (*EXF*) and a dummy that captures Research and Development (*RDF*) or technology licence from a foreign owned company. Unlike previous studies (Kinuthia, 2013; Barrios et al., 2003) that have used proportion of expenditure on Research and Development carried out by foreign owned firms in a given sector to measure the effect of imitation this study uses a dummy variable to capture the use of a foreign licence technology. This is due to the non-availability of data on research and development expenditure for domestic manufacturing firms in Cameroon. A detailed definition of the variables and their expected signs are presented in Table A4, while Table A5 presents the different manufacturing sectors.

#### 4. Presentation and Discussion of Empirical Results

The Heckman selection model is used to estimate equation (1) and (2) since it takes into account the truncated nature of the sub samples of firms in the export propensity model and incorporates a sample selection mechanism given by the export decision equation. The firm level data for the 2 years are pooled, clustering it by firm, which allows the use of robust standard errors and unspecified serial correlation within the firms, while assuming independence between them. To avoid potential collinearity occurring between the spillover variables, the variables are included separately in the estimation and jointly as shown in Tables A6 and A7.

#### **4.1 The export propensity results**

The results of the export propensity estimation are presented in Table A6. The different channels of the effect of MNCs were captured separately in the different columns and jointly in column 4. The results showed evidence of positive spillovers or transmission on the domestic firms' export decision through the demonstration effects as presented in column one. Evidence was also found suggesting positive spillovers through the competition and information channels as presented in column two and three, respectively. The evidence of demonstration effects in Cameroon is consistent with the findings by Langdon (1981) and Gachino (2006). This seems to suggest that the likelihood to export from domestically owned firms was influenced by the decision to use foreign R&D licence. This therefore confirmed the fact that imitation or copying new products or easy processes from foreign owned firms can promote the probability or decision to export. Indeed, Greenaway et al. (2004) has found that in UK there are significant spillovers from R&D activities of foreign firms to domestic firms, but not from the R&D activities of domestic firms to other firms. However, Barrios et al. (2003) observed that R&D channels, whether from domestic or multinational firms do not appear to encourage exporting activities from domestic firms in Spain.

The competition channel was found to be positive suggesting that MNCs may have introduced foreign links in the home markets which positively influence domestic firms. This result is consistent with the findings by Greenaway et al. (2004) who found that the relative importance of multinationals in the domestic markets is positive and significantly associated with a higher probability of the domestic firms to export. The importance of the information channel also suggests that concentration of foreign firms in given sectors benefit domestic firms. This is in contrast to the results of Barrios et al. (2003) who failed to find evidence on information spillovers from exporting activities of foreign owned firms on domestic firms in the same sector but who found evidence that domestic firms located in export oriented sectors are more likely to be exporters. Furthermore, Ruane and Sutherland (2007) observed that it is likely that foreign owned firms engaged exclusively in production for exports can be a source of negative export spillovers. However, the results of Aitken et al. (1997) and Greenaway et al. (2004) showed that information spillovers or channels have a positive and statistically significant effect on the exporting activities of multinationals.

Other results from the estimation showed that size, turnover, experience and insecurity are statistically significant, suggesting their importance in the domestic firms' decision to export. The significance of the turnover, size and experience variables implies that firms are likely to be exporters the larger and more experience they get. These results are consistent with those obtained by Robert and Tybout (1997) and Barrios et al. (2003) in their analysis of the decision to export by Columbian firms and Spanish firms, respectively.

The average wage coefficient is negative and is in contrast with the findings by Aitken et al. (1997) and Bernard and Jensen (2004) where export production is considered relatively skill-intensive due to high wages. The negative wage coefficient obtained in this study provides evidence of labour intensive export oriented foreign owned firms, which would be interested in cost effectiveness including low wages. This may suggest that a labour abundant economy like Cameroon, exporting firms can obtain cheap labour and demand the most from them, in an attempt to increase production and export. This finding is consistent with that of Kinuthia(2013) studying export spillover in Kenyan firms.

The result also showed that insecurity and power outage have a negative effect on the decision to export, suggesting that the presence of insecurity and continuous power failure can discourage domestic firms to decide whether or not to engage in foreign trade. This effect is however statistically insignificant.

#### **4.2 The Export Intensity Results**

The results of the export intensity estimation are presented in Table A7.

The results for the transmission effect of MNCs showed that there exists a positive influence for all the proxies used to capture the spillover effect. The result however showed that only the used of foreign licence technology and the proportion of employment have statistical significant effects on the export intensity in the individual and combined estimations, while the proportion of foreign export in total export is statistically insignificant. The results thus confirmed the existence of a positive effect from demonstration, competition and information channels on the proportion of goods exported by the domestic firms in Cameroon.

Other results showed that domestic firm's export intensity is influenced by turnover, size and experience. Turnover has a positive and statistically significant effect on the intensity to export, suggesting that an increase in turnover was accompanied by an increase in the proportion of sales committed to exports by domestic manufacturing firms. Experience and the size of the firm also have a positive influence on the proportion of goods exported by domestically owned firms. These results are consistent with the findings by Greenaway et al. (2004) in their study of domestic and multinational firms in UK. Finally, insecurity and power outage have negative and statistically insignificant effects on the proportion of goods exported by domestic manufacturing firms.

#### **5. Conclusion and Policy Implications**

The paper had as objective to investigate the effect of MNCs on the export intensity and propensity of domestic manufacturing firms in Cameroon and to identify the various channels through which such effects are transmitted. The literature on MNCs and export performance considers the spillover effect of MNCs suggesting that foreign owned firms operating in host countries can be important sources of export spillovers, through information dissemination concerning foreign markets that can be useful to local firms. In addition, the literature has identified various channels through which the effect of spillovers can be transmitted. In this paper, three channels of export are used namely; information externalities, demonstration effects and competition effects. Using firm level data from the World Bank Investment Climate Survey

(ICS) of companies, for the period 2006 and 2009, the simultaneous decision to export and the export propensity decision were estimated using the two stage Heckman selection model.

The findings from this study revealed that foreign firms influence the export decision of domestic firms positively in Cameroon through the demonstration, competition and information channels. The estimated results also revealed that a firm's decision to export and the proportion exported are influenced by turnover, size and experience. Hence, developing countries like Cameroon which aspire to industrialize and emerge must consider innovative ways which can spur vertical backward linkages between foreign-owned firms and domestic firms. It is also important to put in place policies aimed at promoting foreign direct investment in the country that are complementary and will encourage technological transfer and promote information dissemination. There is therefore dire need to encourage the current socio-economic and political stability existing in the country and to foster and improve the climate of doing business by both foreigners and nationals.

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Foreign	35	30	8	27	-	9	109
Local	83	77	46	110	-	110	426
Total	118	107	54	137	-	119	535

Source: Computed by Author using data from World Bank Investment Climate Survey (ICS)

**Table A2: Mean characteristics of the firms for the survey period**

Variables	Foreign owned firms		Domestic owned firms	
	Exporters	Non Exporters	Exporters	Non Exporters
Wage (average monthly compensation in FCFA)	134537.1	111142.9	137755	88441.71
Labour cost (FCFA)	1.63e+09	2.93e+08	1.80e+09	4.76e+07
Turnover (FCFA)	1.83e+10	4.35e+09	9.43e+09	5.59e+08
Full time employees	138.2647	15.33333	100.2368	25.70435
Power outage losses	4.04e+08	7033333	1.60e+07	1.28e+07
Age (Years of experience)	18.1	23.46667	17.87179	17.55833

Source: Computed by Author using data from World Bank Investment Climate Survey (ICS)

**Table A3: Correlation matrix of spillover variables**

	Research & Development	Proportion of foreign exports	Proportion of foreign employment
Research & Development	1.00		
Proportion of foreign exports	0.45	1.00	
Proportion of foreign employment	0.57	0.64	1.00

**Table A4: Description of explanatory variables**

Variable	Description	Expected sign
EXP	Dichotomous variable that takes the value of 1 if the firm exports and 0 otherwise.	
EXINS	Export intensity of domestically owned exporting firms measured as a ratio of firm <i>i</i> 's exports to turnover.	
WAGE	Log of Average wage per employee.	+/-
TURN	Log of Firm's turnover.	+
EXPER	Number of years operating in the sector.	+
SIZE	Number of employees.	+
POWER	Number of times experience power outage.	-
INSECURITY	Dichotomous variable that takes the value of 1 if the firm indicates that it experience losses to theft, robbery, vandalism or arson and 0 otherwise.	-
RDF	Dichotomous variable that takes the value 1 if the firm uses technology licence from a foreign owned company and 0	+

	otherwise.	
FEM	Ratio of foreign owned firms share in employment in sector j to total employment in sector j.	+
FEX	Ratio of foreign owned firms exports in sector j to total exports in sector j.	+

**Table A5: Classification of firms**

Sector	Domestic	Foreign
Textiles	4	0
Garments	11	0
Food	34	24
Metals and machinery	14	3
Electronics	1	1
Chemicals and pharmaceuticals	12	3
Non-metallic and plastic materials	3	5
Other manufacturing	80	28
Retail and wholesale trade	1	1
Total	160	65

**Table A6: Empirical Results on the propensity to export**

Variable	Coefficient (Standard error)	Coefficient (Standard error)	Coefficient (Standard error)	Coefficient (Standard error)
RDF	0.2717** (0.121)	-	-	0.1145*** (0.0542)
EMF	-	0.0182*** (0.0034)	-	0.0134* (0.0071)
EXF	-	-	0.0686 (0.0543)	0.0218 (0.0141)
WAGE	-0.2354 (0.2908)	-0.2322 (0.2571)	-0.202 (0.3122)	-0.165 (0.3652)
TURN	0.5384*** (0.1602)	0.5132*** (0.1505)	0.4537*** (0.1225)	0.3433** (.1619)
SIZE	0.0120* (0.0063)	0.0162*** (0.002)	0.0152*** (0.0011)	0.0134* (0.0068)
EXPER	0.06471** (0.0304)	0.07321** (0.02216)	0.03216** (0.0121)	0.03021** (0.0123)
INSEC	-0.0383* (0.024)	-0.0450** (0.016)	-0.0221* (0.0104)	-0.0315** (0.0154)
POWER	-0.0013 (0.0024)	-0.0021* (0.0011)	-0.0018 (0.0021)	-0.0015 (0.0035)
Constant	-2.154*** (0.3763)	-2.021*** (0.3032)	-2.0884*** (0.4135)	-3.4327 (1.0231)
Observations	157	151	154	150
Log Likelihood	-90.6045	-81.9181	-74.8721	-66.4353
Wald Chi-square (7)	71.45	64.62	63.25	-
Wald Chi-square (9)	-	-	-	89.87

\*\*\*, \*\* and \* significance at the 1%, 5% and 10% levels, respectively

**Table A7: Empirical Results for the Export Intensity Equation**

Variable	Coefficient (Standard error)	Coefficient (Standard error)	Coefficient (Standard error)	Coefficient (Standard error)
RDF	0.3385* (0.1811)	-	-	0.2156* (0.1263)
EMF	-	0.0243** (0.010)	-	0.0114* (0.0075)
EXF	-	-	0.0465* (0.027)	0.0304 (0.019)
WAGE	-0.08560 (0.0864)	-0.0758 (0.0801)	-0.0695 (0.071)	-0.0713 (0.0912)
TURN	1.1808*** (0.1149)	1.519* (0.811)	1.028* (0.523)	1.234** (0.5513)
SIZE	0.0032* (0.0017)	0.0041* (0.0021)	0.0038* (0.0023)	0.0049** (0.0023)
EXPER	0.0441** (0.0223)	0.0451* (0.0255)	0.0414** (0.0203)	0.0362** (0.0157)
INSEC	-0.0619 (0.9503)	-0.0746 (0.8166)	-0.0592 (0.7037)	-0.0605 (0.0791)
POWER	-0.0091 (0.0118)	-0.0071 (0.0104)	-0.0087 (0.0214)	-0.0083 (0.0135)
Constant	-14.956 (28.676)	-12.397 (27.547)	-15.474	-8.287 (25.222)
Observations	157	151	154	150
Censored Observations	118	113	116	112
Uncensored Observations	39	38	38	38
$\rho$	0.6952 (0.0698)	0.6018 (0.0664)	0.5420 (0.0971)	0.5968 (0.0644)
Sigma	6.2420 (0.2447)	5.9203 (0.1690)	5.8754 (0.1761)	5.9156 (0.1666)
$\lambda$	4.3394 (0.5892)	3.5631 (0.4728)	3.1845 (0.6464)	3.5304 (0.4586)
LR test for independence of equations (Rho = 0)	13.06	26.75	18.12	31.07
prob>chi <sup>2</sup> (1)	0.0003	0.0000	0.000	0.0000

\*\*\*, \*\* and \* significance at the 1%, 5% and 10% levels, respectively