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Abstract: Using firm-level data, this paper investigates whether Foreign Direct Investment (FDI), and hence Multinational Enterprise (MNE) presence, explains India's improved export performance during post-reforms. The recent literature stresses that firm heterogeneity gives some firms an edge over others to self select into export market. Apart from ownership, this paper takes into account firm heterogeneity and various other firm-specific factors while understanding firm-level export performance. Hausman-Taylor estimation results show that foreign ownership does not have significantly different impact on export performance over domestic firms across sectors in Indian manufacturing. Rather firms acquire internationally competitiveness from imported raw materials, foreign technical know-how and local R&D. Further, firm heterogeneity measured in terms of sunk costs significantly impacts on firm-level export intensity. The study further reveals that there are ownership specific factors that determine firm-level exports. The results have significant implications for policy in order to attain international competitiveness of firms in India.

Key words: *Export competitiveness, FDI, Multinational Enterprises, Firm Heterogeneity, Hausman-Taylor estimation, Dynamic Panel Data estimation*.

Introduction

Foreign Direct Investment (FDI), especially Multinational Enterprises (MNEs)[1], through by bringing in a bundle of tangible and intangible assets such as technology and know-how, skill, efficient marketing and distribution networks, managerial capabilities etc., provides impetus in accelerating export performance in host economies. This is especially true for an emerging market economy including India. MNEs access foreign markets with much more ease than their domestic counterparts in the host country and often use the host country as an export platform. Again the MNEs, given their scale of operations and a wide array of intangible assets also have the capability to overcome the huge sunk costs while entering export markets.[2] These specific advantages give the foreign firms an edge in the export market than the domestic firms. Apart from ownership, the recent literature shows that firm heterogeneity measured in terms of differences in productivity and/or sunk costs is one such factor determining export performance. This paper investigates into the factors including ownership (foreign vis-à-vis domestic) pattern of firms explain post-reforms export performance across manufacturing industries in India.

The reforms in foreign investment policy measures initiated in 1991 made India more open and proactive with a view not only to get better access to technology but also to build strategic alliances to penetrate the world market (Ahluwalia, 2008) and improve India's export competitiveness (Kumar and Joseph, 2007).[3] With wide ranging reforms, the firms across sectors responded differently to the stimuli resulting in varied export performance[4]. Such evidence is indicative of the continuing existence of various firm specific factors including productivity and sunk cost that determine performance.

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[1] MNEs, being the main channel through which FDI flows into host countries, either acquire a substantial controlling interest in a host country firm or sets up a subsidiary in a host country (Markusen, 2002).
[2] See Greenaway and Kneller (2007); Roberts and Tybout (1997), for details.
[3] See Nagaraj (2003) for a different view which suggests that there is little evidence to show that higher FDI inflows have led to faster output and export growth in India.
[4] See Sinha Roy (2007) for detailed account of varying export performance across sectors.

There is a rich body of literature analyzing the various dimensions of the effect of FDI on export performance and export spillovers. Despite the evidence of export-enhancing role of FDI in the literature[5], there is no conclusive evidence on better export performance of MNEs over local enterprises. A varying FDI-export relationship can be traced across countries (Pain and Wakelin, 1998) and sectors (Furtan and Holzman, 2004; James and Ramstetter, 2008). While some studies, for instance by Reidel (1975), Solomon and Ingham (1977), Jenkins (1979), Kirim (1986), find no significant difference between the export performance of foreign controlled enterprises and their local counterparts, Cohen (1975) finds domestic firms outperforming foreign firms.

For India, Aggarwal (2002) and Siddharthan and Nollen (2007) find better export performance of MNE affiliates than their dometic counterparts.[6] Further, Aggarwal (2002) shows that low-tech industries with high foreign ownership have better competitive advantage than high-tech ones. Earlier, Subrahmanian and Pillai (1979) and Kumar (1989) also arrived at similar results in case of Indian manufacturing sector. This is in line with other empirical works relating to India and other developing countries [Newfarmer and Marsh, (1981), quoted in Lall and Mohammad, (1983)]. Singh (1986), in a different analysis, finds that the foreign firms have higher export intensity compared to local pharmaceutical firms.

Apart from ownership, a recent strand of research focuses on the effects of, among other factors, firm heterogeneity measured in terms of productivity on industry performance. Bernard and Jensen (1995, 1999) and Aw, Chung and Roberts (2000) show strong self selection by productive firms in the export market.[7] These empirical observations are formalized by Melitz (2003) in a theoretical model with heterogeneous firms. Further, empirical literature by Roberts

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[5] See, for instance, Athukorola et al. (1995), Barry and Bradley (1997), Blake and Pain (1994), Cabral (1995), Haddad et al. (1996), Jongwanich and Kohpaiboon (2008), Lopez (2005), O'Sullivan (1993), Raff and Wagner (2014), Sun (2009), Willmore (1992), and Xuan and Xing (2006).

[6] It is instructive to note that Siddharthan and Nollen (2007) analyse export performances of services (information technology) firms.

[7] Aw, Chung and Roberts (2000), Baldwin and Gu (2003), Bernard and Wagner (1997), Bernard and Jensen (1999), Clerides, Lach and Tybout (1998), Delgado et al. (2002), Kathuria and Aiyar (2011) show that only a small fraction of firms export and the exporters are larger in size and are more productive than the non-exporters. Ranjan and Raychaudhuri (2011) and Srinivasan and Archana (2011), for Indian manufacturing, suggest that exporters tend to outperform the non-exporters in terms of productivity and size, among other indicators.

and Tybout (1997), Bernard and Jensen (2004), and Das, Roberts and Tybout (2007) suggest that there exist large sunk costs of exporting in developed and developing countries alike, which explain export performance of firms. Similar results are arrived at in an extensive survey of theoretical and microeconometric evidence by Greenaway and Kneller (2008). Further, firm productivity is found to work through heterogeneous skills of workers (Yeaple, 2005), importing activities of firms (Castellani, Serti and Tomasi, 2008) and competition among heterogeneous firms (Castellacci, 2011). Using firm-level data on Indian manufacturing, Srinivasan and Archana (2011) show that firm heterogeneity is an important determinant of the decision to export. As multinational firms generally tend to be more productive than domestic ones (Greenaway and Kneller, 2007), the theoretical conjecture of firm heterogeneity needs to be accounted for while understanding the differences in export performance between MNEs and their local counterparts in a host economy.

The studies reviewed above bring forth that the nature of FDI-export relationship across countries is far from conclusive. Further, most of these studies have not taken into account firm heterogeneity while exploring the FDI-exports relationship. This research work investigates into firm-level export performance across manufacturing industries in India during post-reforms period. In doing so, the study controls for various supply side factors including heterogeneity of firms that determine export performance of Indian manufacturing enterprises while highlighting on whether foreign ownership is key to firm-level export performance. This is where the study, in particular, contributes to the existing literature.

The paper is organized as follows. Section 2 provides some stylized facts on the overall export performance of the Indian manufacturing industries during 1991-2010. Section 3 discusses the analytical framework, the empirical model and method, and the database for analyzing the determinants of firm-level export performance. Section 4 presents the empirical results and discusses on the determinants of firm-level export performance. Section 5 summarizes the major findings of the paper following them by implications for policy.

Export Intensity during Post-Reforms: *Some facts*

The existing literature shows a theoretical possibility and an empirical connect between FDI and export performance. It can be observed from Figure 2.1 that, despite a downturn after 2008, both FDI intensity as well as export intensity increased in India since 1991. Along with increasing FDI inflows, firm-level average export intensity measured as the ratio of export of goods to sales (expressed in percentage) across manufacturing sectors in India improved during post-reforms, especially after the year 2000. The average export intensity for all the sectors, as is evident in Table 2.1, increased from 0.10 in 1990s to 0.15 in 2000s, the corresponding ratio for chemicals, transport equipment, machinery, food and beverage, textile and basic metal industries also increased after 2000.

Figure 2.1: India's FDI Inflows and Exports since 1991

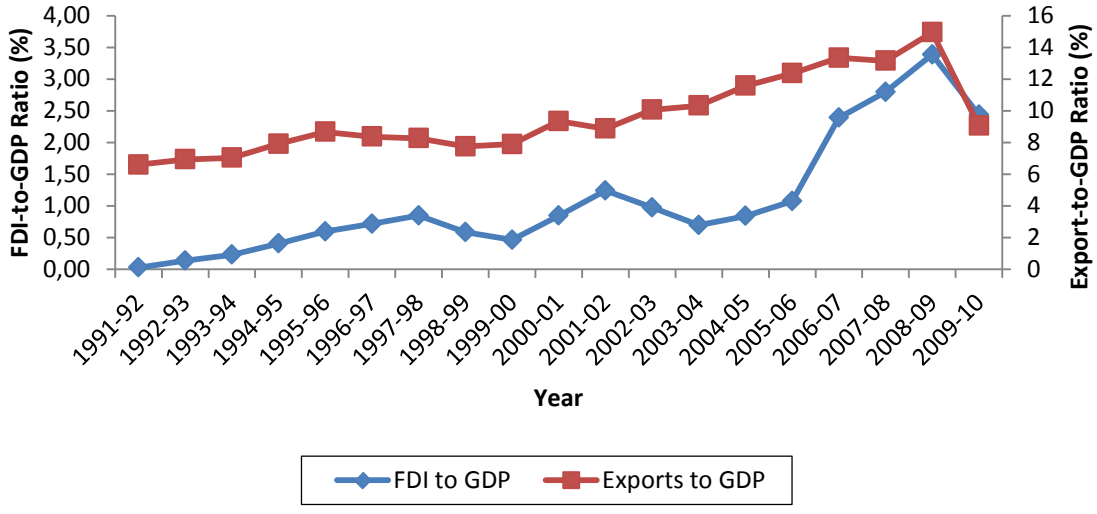

Table 2.1: Firm-level Average Export Intensity in India during Post-Reforms

Industries	Food & Beverage	Textiles	Chemicals	Basic Metals	Machinery	Transport Equipment	All
All Sample Firms							
1990s	0.24	0.22	0.09	0.08	0.04	0.10	0.10
2000s	0.28	0.29	0.18	0.15	0.10	0.11	0.15
Only Domestic Firms							
1990s	0.06	0.21	0.06	0.53	0.04	0.01	0.14
2000s	0.07	0.33	0.12	0.01	0.06	0.06	0.28
Only Foreign Firms							
1990s	0.04	0.02	0.04	neg	0.05	neg	0.11
2000s	0.03	0.03	0.16	neg	0.07	0.0005	0.28

Note: 'neg' refers to negligible
Source: Calculations based on CMIE, PROWESS database.

Average export intensity of chemicals doubled in the decade of 2000s over that in the 1990s with drugs and pharmaceutical industry accounting for a large share (see Table A1). It is important to mention here that foreign investments up to 100 per cent have been allowed in this sub-sector since December 2001. Despite improvements in the machinery sector as a whole, the firm-level average export intensity for electronics and electrical machinery continues to remain low during 2000-2010. However, miscellaneous electrical and computer, peripherals and storage devices have shown rising share in the decade of 2000 (See Tables A3 and A4) with the export intensity of computer, peripherals and storage devices increasing from 0.10 in the 1990s to 0.22 in 2000s. On the other hand, the corresponding improvements are relatively small for transport equipments[8]. The improvements in export intensity in textiles can largely be on account of the potential benefit accruing in the post-MFA regime. Such improvements in textiles are despite low productivity, technological obsolescence, low scale of operation, and rigid labour laws (Tewari, 2005).

Export intensity of non-ferrous items including aluminum and products, copper and products and other non-ferrous items registered quantum increase post-2000(Table A6). This is not to deny the increase in export intensity for some

[8] *Transport equipments show an increase in export intensity, particularly after 2003. This is of particular importance as many joint ventures have been set up in India with foreign technical and financial collaboration.*

iron and steel products[9] (Table A5). In case of food and beverages, coffee and value-added items like marine food and processed and packaged food also show increased export intensity after 2000 (Table A7). A quantum increase in export intensity is thus noticed in value-added sectors like drug and pharmaceuticals, miscellaneous electrical, computers, peripherals and storage devices, steel, tubes and pipes, copper and copper products, coffee, marine food and processed and packaged food industries during post reforms. This is conformity with the findings of Aggarwal (2002), Kumar and Pradhan (2003).

There are further nuances to improvements in performance. At this juncture, it is important to understand whether export performance significantly varies across ownership pattern, given the perception that foreign firms perform better than their domestic counterparts especially during post reforms. Table 1 shows that average export intensity has increased for domestic firms and the foreign firms alike post 2000. The only exception to this pattern is in basic metals industries. The export intensity of the foreign firms in food and beverages industry also shows a marginal decline after 2000. For the period as a whole, the differences in export performance between foreign and domestic firms across manufacturing sectors are shown in Table 2. Domestic firms in food and beverages industry is found to significantly perform better than foreign firms[10]. Exports of domestic firms in transport equipment industry also significantly (at 5 per cent level) outperform that of foreign firms. In case of high technology chemicals and machinery industries, on the contrary, foreign firms are not found to have significantly higher export intensity than domestic ones.

[9] *Except for pig iron, export intensity of most iron and steel products increased during post 2000 when compared to pre-2000 period. China is one of the major iron and steel markets accounting for about 32 percent of India's total exports of these products in 2006.*

[10] *Basic metals and textiles are excluded in the analysis as the number of foreign firms as compared to domestic firms are too less to produce statistically valid results.*

Table 2.2: Ownership-wise difference in firm-level average export intensity

Industry	Mean export intensity of the domestic firms	Mean export intensity of the foreign firms	t value	Inference
Food and Beverages	0.06	0.05	3.10	Significant difference
Machinery	0.05	0.06	-1.50	No Significant difference
Chemicals	0.10	0.11	-0.62	No Significant difference
Transport Equipment	0.04	0.007	2.26	Significant (at 5%) difference

Note: t values calculated using two-sample (export intensity of the domestic and the foreign firms) mean comparison test with unequal variances.
For large sample, the critical t value at 5% level of significance is 1.96 and at 1% level is 2.57.

On the whole, firm-level export intensity across manufacturing industries in India shows an increase in the post reforms period particularly after 2000 which is indicative of the fact that Indian manufacturing has grown internationally competitive. The composition of the Indian export basket is found to have inclined towards value-added items during post reforms. The findings pose a case for understanding the factors underlying varied export performance of foreign and domestic enterprises across low/medium technology and high technology industries in India. While inquiring into the factors underlying the observed (no-)difference in export performance across ownership categories, firm heterogeneity is taken into account following the recent literature.

Determinants of firm level export performance

A. *Analytical framework*

FDI flows to emerging market economies can have across-the-board impact on the host economy. MNEs Apart from supplementing resource mobilization, facilitating access to world class technology, and providing better marketing and distribution networks and managerial skills, MNEs accelerate exports and expand output with larger scale of operation. MNEs can potentially induce domestic firms to export

(Kumar, 1994). Apart from ownership advance, following Greenaway and Kneller (2007), higher productivity of MNEs are expected to lead to improved export performance over their domestic counterparts. Further, export intensities for MNEs in each sector are expected to be higher given their better ability to bear sunk costs of exporting,. Again, firm-specific supply factors including size and age of the firms, import of raw materials, imported capital goods and foreign technical knowhow, expenditure on advertising and marketing, local R&D, availability to credit are crucial in determining firm-level exports. These perspectives help develop the framework for analyzing firm-level export performance in an emerging market economy like India.

A.1 *Ownership*

Presence of MNEs often has positive impact on overall export performance, as observed earlier. Multinational firms, as against their domestic counterparts, overcome the possible entry barriers in foreign market on account of firm specific advantages (Greenaway et al., 2004). These advantages can be in the form of acquisition of knowledge-based assets, better managerial knowhow, strong marketing and distribution channels, branding, capability to bear sunk cost etc. Again, MNEs, on account of large scale of operations, have lower per unit cost. Thus, ownership, and hence MNE presence, is likely to play an important role in explaining export performance. For India, as has been observed in earlier studies, MNE affiliates are found to have better export performance of MNE affiliates than their local counterparts.

A.2 *Productivity*

The empirical literature shows that trade forces least productive firms to exit the market [see, among others, Aw, Chung and Roberts (2000) and Clerides, Lach and Tybout (1998)]. These studies imply that a few productive firms, which expect a profit stream sufficiently high to cover the sunk costs of entry into a foreign market, find it profitable to export. As observed earlier, models following Melitz (2003) explicitly postulate that firms are heterogeneous and only productive firms

self-select into export market. To incorporate firm-heterogeneity in the estimation model, firm productivity is used. In this study, productivity is postulated to have positive impact on exports at the firm level. However, such studies on Indian manufacturing linking productivity and exports are rare.

A.3 *Specific costs*

Exploring a foreign market requires strong marketing and distribution networks. If a firm incurs expenditure on advertisement marketing and distribution, and creates service networks, it might attain cost competitiveness in exporting its product in a foreign market. These costs are sunk in nature and cannot be recovered (Baldwin, 1999). Hence, in this model, advertising, marketing, and distribution expenditure are considered to be positively influencing export performance. Following Srinivasan and Archana (2011), a positive relationship between such costs borne by firms and exports is expected. This is despite wide variance in expenditure on advertising, marketing and distribution among Indian firms.

A.4 *Research and Development*

In an increasingly knowledge based world, technological capacity is seen as an important component of a country's international competitiveness and growth (Kumar and Aggarwal, 2005). The literature suggests that there can be several export channels of R&D. In-house research and development makes a firm cost competitive and thereby its export performance improves (Fargerberg, 1988; Soete, 1981). Further, with FDI inflows and MNE operations, transfer of both embodied and disembodied technology through internalized modes to MNE affiliates and externalized modes of joint ventures, franchising, licensing, arm's length sales of capital goods, technical assistance and subcontracting take place. Such technology transfers are often complemented by firm's R&D (Basant and Fikkert 1996) through product improvement/adaptation, process improvement and original equipment manufacturing which is of particular importance for export expansion of emerging economies. Veugelers and Cassiman (1999), Roper and

Love (2002) provide evidence that R&D expenditure have significant positive impact on firm's export intensity. Firm-level studies on Indian manufacturing [for instance, Aggarwal (2001), Kumar and Siddharthan (1997), Patibandala (1995)] also focus on export augmenting role of R&D expenditure. In this study, a positive relationship between in-house R&D and firm-level export performance is expected.

A.5 *Import of technology*

The literature provides evidence on spillovers of knowledge and technology between trade partner countries (Ben-David & Loewy, 2000; Keller, 2002; Lucas, 2009). Grossman and Helpman (1991) and Coe, Helpman, and Hoffmaister (1997) show that imported products through foreign technology introduced to domestic production increase total factor productivity. Most developing countries have relied extensively on technology import (Kathuria, 1998). In India, import of technology is one of the major channels of knowledge acquisition by firms. Technology can be imported in both embodied and disembodied forms. Embodied technology is imported in the form of raw materials, intermediate goods and capital goods, while imported disembodied technology includes patented knowledge, technical know-how, drawings and designs etc. It is believed that, like in-house R&D, technology imports makes a firm cost competitive and thereby induces exports to grow. In the post-reforms period, import of technology is likely to have positive impact on firm-level exports. The relationship can possibly be non-linear as well.

A.6 *Firm size*

Large sized firms are perceived to have greater resource base and better risk perception of the international market. Size is a proxy for several effects (Bernard and Jensen, 2004) including economies of scale that determines the export attitude and performance of a firm (Kumar and Pradhan, 2003). Smaller firms with their resource constraints are mostly scale inefficient, while larger firms can exploit economies of scale. Thus, larger firms have lower average and/or marginal costs which aid exports (Srinivasan and Archana, 2011). Further, large firm size is also characterized by economies of scope with their ability to bear sunk

costs related to exports. This facilitates promotion and distribution of products in foreign markets. Hence, a positive relationship between firm size and export performance is hypothesized, though empirical literature show mixed findings. In addition, Bernard and Jensen (1999), Bernard and Wagner (1997) establish a linear relationship between firm size and export performance, while Kumar and Siddharthan (1994), Bernard and Wagner (2001), Bonaccorsi, (1992) and Sterlacchini (2001) establish a nonlinear relationship.

A.7 *Age*

Age of a firm, in the literature, shows the extent of a firm's learning experience leading to greater experimental and tacit knowledge (Bhaduri and Ray, 2004). Older firms, with experience in exporting have better knowledge of export markets and are also capable of bearing the sunk costs of exporting with already established marketing and distribution channels. Hence, older firms have better capability to export. Age of firms is thus positively associated with exporting (Rasiah, 2003; Iyer, 2010). In this study age of the firm is considered to be positively related to export intensity.

A.8 *Availability of Credit*

There are empirical studies, which explain the impact of credit constraints on firm's export performance[11]. There is also a growing body of recent theoretical literature that looks at the impact of credit market imperfections on firms within the Melitz (2003) framework [e.g. Chaney (2005); Helpman, Melitz and Rubinstein (2008); Manova (2008)]. The main results of these studies show that in addition to heterogeneity of firms, credit constraints also affect exports of firms. In the Indian context, Kapoor, Ranjan and Raychaudhuri (2011) have established a causal link from availability of subsidized credit to small firms' credit constraints to real outcomes of exporting firms. In this study, higher credit availability is expected to improve firm-level export performance.

[11] *See, for instance, Mirabelle (2008), Greenaway, Guariglia and Kneller (2007) and Paravisini, Rappaport, Schnabl and Wolfenzen (2011).*

The Estimation Models

In the estimable form, export intensity of a firm is considered to depend on production and various supply side factors including age, size technology imports and credit availability. Firm heterogeneity in terms of firm productivity and sunk costs are also controlled for while looking into the impact of ownership on exports. The model as estimated is as follows:

$$Expi_{it} = \alpha_0 + \alpha_1 (size_{it}) + \alpha_2(impr_{it}) + \alpha_3(ki_{it}) + \alpha_4(fptr_{it}) + \alpha_5(mktcost_{it}) + \alpha_6(age_{it}) + \alpha_7(pdtivity_{it}) + \alpha_8(crdt_{it}) + \alpha_9(rdi_{it}) + \alpha_{10}(own_i) + u_{it} \quad (3.1)$$

where, $\alpha_{k,\ k=1 \text{ to } 10} > 0$

expi: export intensity measured by ratio of exports to sales at the firm level;

size: size indicated by ratio of firm sales to industry sales;

impr: raw material import intensity measured by ratio of expenditure on imports of raw materials to sales;

ki: capital goods import intensity measured by ratio of expenditure on imports of capital goods to sales;

fptr: foreign technical know-how intensity measured by ratio of technical fees and royalties paid abroad to sales;

mktcost: specific costs measured by ratio of summed up advertising, marketing and distribution expenditure to sales;

age: absolute age of the firm in number of years since incorporation;

pdtivity: labour productivity measured by ratio of value of output to salaries and wages[12];

crdt: availability of credit measured by ratio of total borrowing to value of output;

rdi: R&D intensity measured by ratio of R&D expenditure to sales;

own: ownership is a dummy variable taking the value 1 if the firm is foreign and 0 otherwise. In this model, as specified in Equation (3.1), ownership is the time-

[12] *Srinivasan and Archana (2011) have also used labour productivity in the estimation as against total factor productivity mostly used in the 'heterogeneity' literature.*

invariant variable. As the sectors analysed in this study widely vary, the model (3.1) has been modified for some sectors. Two variables have been used for the purpose, namely:

fortech : foreign technology intensity measured by ratio of the sum of expenditure on import of capital good, import of raw materials and import of foreign technical know-how to sales, and

sci: sunk costs intensity measured by share of sum of advertising expenses, marketing expenses, distribution expenses and R&D expenses to sales of the firm.

At this juncture, it is important to understand that the model specified in 3.1 is the case for Indian manufacturing as a whole comprising of domestic and foreign firms. However, theoretically domestic firms and foreign firms should have different motives. Foreign firms are the subsidiaries of the firms that are headquartered in foreign countries and these firms are likely to depend on the resources of the parent firm. This is surely not the case of domestic firms. Often, in the literature, ownership specific models are estimated (see Siddharthan and Nollen, 2004) to bring out the behavioural differences of foreign and domestic firms. Such ownership specific models can be as follows:

$$x_{ijt} = \alpha_0 + \alpha_1(x_{ijt-1}) + \alpha_2(size_{ijt}) + \alpha_3(age_{ijt}) + \alpha_4(impr_{ijt}) + \alpha_5(mktcost_{ijt}) + \alpha_7(rdi_{ijt}) + \alpha_8(pdtivity_{ijt}) + \alpha_9(crdt_{ijt}) + \alpha_{10}(fortech_{ijt}) + uit \quad (3.2)$$

where $\alpha_{k,\ k=1\ to\ 10} > 0$, j denotes either domestic or foreign ownership and t denotes times, and

x_{ijt}: export intensity of i^{th} firm with j^{th} category of ownership at time t.

B. The Method and Data

In our analysis we have used the Hausman-Taylor and Dynamic Panel Data estimation techniques. The Ordinary Fixed and Random Effects estimation methods are initially used to identify the control variables. Mundlak (1978) argues

that the Random Effect models assume exogeneity of all regressors and the random individual effects, while the Fixed Effect estimation models allows for endogeneity. Hausman and Taylor (1981) proposed estimation procedure where some of the regressors are correlated with the individual effects. The resulting Hausman-Taylor estimator bases upon an instrumental variable estimator which uses both between and within variations of the strictly exogenous variables as instruments (Baltagi et al. 2003, Cameron and Tribedi, 2010). Specifically, the individual means of the strictly exogenous regressors are used for instruments for the time-invariant regressors that are correlated with the individual effects. As fixed effect models do not generate coefficients of time-invariant regressors, the Hausman-Taylor estimation becomes appropriate.

As time-invariant regressors are absent in ownership specific model (3.2), Panel Data estimation technique is used. This method helps to simultaneously accommodate large volume of data set across time and distinguishes between time-series movement and cross-sectional movement of the data. Dynamic effect can be examined in panel data analysis by introducing lagged dependent variables in the set of explanatory variables. The model, with one year lagged dependent variable, looks like:

$$Y_{it} = X_{it}^{/} B_1 + Y_{it-1} B_2 + E_{it}$$

(3.3)

where i = 1, 2, 3,……., m; t = 1, 2, 3, ……., T

m = number of cross-sectional units; T = number of time period

Here the lagged dependent variable, Y_{it-1} captures the entire historical impact of the explanatory variables. The problem however arises at the time of estimation. The Least Square Dummy Variable (LSDV) method and Feasible Generalised Least Square (FGLS) methods are inappropriate to estimate the model. Dynamic panel data estimation is usually carried out using 'Generalised Methods of Moments' (GMM). This is done by estimating the model in first difference to avoid the problem of endogeneity arising due to the presence of

lagged endogenous variable in the set of explanatory variables. The GMM IV estimation of Arellano and Bond (1991) is applied to obtain unbiased consistent estimators. A 2-stage iteration method is used to get Arellano and Bond 2-step estimators. In order to obtain original Arellano and Bond estimates, no correction for the degree of freedom is carried out. In this type of estimation, Sargan test of over-identifying restriction is checked.

Firm-level data across manufacturing sectors for the period 1991-2010 are obtained from PROWESS Database published by the Centre for Monitoring Indian Economy (CMIE). PROWESS provides information from audited financial statements of companies and thereby uses company balance sheets and income statements as sources of information. The database covers both listed and unlisted firms from a wide cross-section of manufacturing, services, utilities and financial industries covering 60-70 per cent of organized sector in India, 75 per cent of corporate taxes and 95 per cent of excise duties collected by the Government of India (Goldberg et al., 2010). However, the database has some limitations especially with regards to this analysis. First, an important step involves identifying the firms according to ownership or finding the "FDI firms"[13] as against "non-FDI firms". PROWESS provides data for foreign promoter's equity holdings. If for a company, equity holding of the foreign promoter exceeds 25 percent, it is classified as a foreign owned firm or a "FDI firm". However, foreign promoter's equity holdings are reported in the database only for post 2001 period. As this study covers a twenty-year period (1991 to 2010), the information on equity holdings to identify company ownership cannot not be used. Further, numerous missing values of equity participation also reduces the sample size in a big way. The database instead provides separate information on the ownership group of firm in the sense of whether a firm is 'Private Indian', 'Private Foreign' or a 'State-run' enterprise. This information is used in the study to identify domestic and foreign ownership of firms. Such an ownership classification however does not differentiate between

[13] *Statistical information on India's overseas FDI can be availed. However, the database does not provide any information on source- and destination-wise FDI. As a result, the database does not provide any scope to arrive at re-directed investment and hence, estimates of "actual" foreign investments in India.*

MNE affiliates and licensees of foreign firms as in Siddharthan and Nollen (2004), between wholly owned foreign enterprises and joint ventures, nor between foreign investment firms and investment-from-Mauritius firms, as is often done in the literature.

Second, the information on firms used in the study, being based on balance sheet of firms, are not product-specific. Thus it is not possible to carry out an analysis for multi-product firms. The comparison between MNEs and domestic firms considered are not product specific, even though most firms are multi-product by nature. Instead, mainly on account of non-availability of detailed product-wise data for individual firms, broad product groups are considered. This observed gap in the database will preclude any product specific comparison of performance between foreign and domestic firms.

Third, the PROWESS database also does not provide data on output. However, firm-level data on sales is available over the years. Data on change in stock can be calculated from the available data on opening stock and closing stock for each firm, each year. This gave us the measure of value of output. Again, the database does not provide information on the number of employees. However, it provides data on salaries and wages. This information has been used as a proxy to calculate productivity as the ratio of value of output to salaries and wages.

The problems with data notwithstanding, the sectors used in this study include chemicals, machinery, transport equipments, food and beverages, textiles and basic metal industries. Statistical information is collected only for exporting firms. A total of 1473 observations for the chemicals industry, 777 observations for the machinery industry, 326 observations for the transport equipments industry, 154 observations for the food & beverages industry, 596 observations for the textiles and garments industry and 143 observations for the metal and metal product industry are obtained. These 3469 observations across sectors include both domestically owned and foreign owned firms. Panel structures for each of the six industries are constructed over a period of twenty years, 1991-2010. For the ownership specific model of (3.2), 1538 domestic firms and 256 foreign firms for

Indian manufacturing as a whole are used for dynamic panel data analysis[14]. Though the number of foreign firms is less than that of domestic firms, the individual samples are large for econometric estimation as they are panel structures covering twenty years. In what follows is a discussion of the estimation results.

The Empirical Results

The Hausman-Taylor estimation results of equation (3.1) showing the determinants of firm-level export performance are presented in Table 4.1. Apart from exports, as Hausman-Taylor estimation technique demands, the variable 'productivity' is treated as endogenous. The Wald statistic justifies the overall significance of the model. The Hausman-Taylor estimation results, as shown in Table 4.1, suggest no impact of ownership on firm-level exports in Indian manufacturing. This finding is in sharp contrast to the common contention that foreign ownership promotes exports. The literature suggests that FDI and MNE operations lead to export growth in the host economy (see Aggarwal, 2002; Kumar and Pradhan, 2003 for India). However, this finding is in conformity with Athukorola et al. (1995), who find no significant relationship between MNE affiliation and export orientation of firms. This counter-intuitive result needs to be explained after the impact of other supply factors are analysed.

The existing literature shows that firm heterogeneity measured in term of firm productivity impacts on a firm's export performance. Estimation results shown in Table 4.1 reflect that productivity of firms is significant in explaining the differences in firm-level export intensity only for machinery industry. In this case, the relationship is found to be linear and conform to the pattern as shown in the theoretical conjectures by Melitz (2003). However, firm heterogeneity, as measured by labour productivity, is not a significant determinant for all other major industries. This is despite the fact of a significant improvement in firm-level productivity growth

[14] *Sector-wise, ownership-specific, analysis could not be attempted as the number of foreign firms in certain sectors like textiles and basic metals are too small to have significant econometric results.*

across industries since the early 1990s. Not only labour productivity across sectors improved during post reforms in 1991 leading to improvements in cost competitiveness, Parameswaran (2014) also show firm-level total factor productivity growth across most industries including food products, textiles, chemicals, basic metals and metal products, machinery – non-electrical, electrical and electronic – and transport equipment industries since the early 1990s, with a significant step up in productivity growth since 2000-01.[15]

Heterogeneity of firms measured in terms of sunk cost is also important in explaining export performance (Roberts and Tybout, 1997, Schmitt and You, 2001; and Das, Roberts and Tybout, 2007). In this study, specific costs including advertisement, marketing and distribution cost explain the sunk cost incurred to penetrate into the foreign market. It is found that, as hypothesized, marketing etc. cost intensity turns out to be significant for the high-tech industries like chemicals and machinery industries. This is also true for the low tech textile industry. Non-linearity in the relationship exists. For the transport equipment and the food and beverages industries, firm-level sunk costs including marketing etc. costs and R7D expenditure impact on exports in a significant way. Again, it is expenditure on advertising, marketing and distribution networks and not R&D that explain exporting of machinery and textiles. It is important to note here while the later has significantly increased over the years, the former continues to remain low in most industries. Srinivasan and Archana (2011) as well arrived at similar results. These results conform to the theoretical conjecture that firms are heterogeneous in terms of sunk costs and the capability of overcoming this sunk cost of entering a foreign market is quite an important factor to explain export intensity.

[15] *Krishna and Mitra (1998), Balakrishnan et al. (2006), and Topalova and Khandelwal (2011) also arrive at similar results. Ghose and Roy Biswas (2014) show that improvements in manufacturing productivity, though for a different period, are largely on account of technical change.*

Table 4.1: Factors determining firm-level export performance: Hausman-Taylor Estimation

	Chemical	Machinery	Transport Equipment	Food and Beverage	Textile	Basic Metal
Own (Time invariant exogenous variable)	-0.07 (-0.76)	0.006 (0.14)	2.16 (0.21)	-0.11 (-1.47)	-18.25 (-0.38)	0.01 (0.07)
Age	**0.003*** (5.93)	0.0003 (0.71)	**0.71*** (8.79)	0.0004 (0.64)	-0.01 (-0.43)	**0.0005*** (5.09)
Size	**1.32*** (3.18)	-1.36 (-0.07)	-21.01 (-1.06)	**0.45**** (2.41)	65.33 (1.34)	**0.34*** (2.78)
Mktcost	**1.17*** (7.56)	**0.49*** (2.63)	----	-----	**63.79*** (3.75)	----
Mktcost^2	**-3.34*** (-8.40)	**-1.49**** (-2.45)	-----	-----	**-20.75*** (-3.48)	-----
Rdi	**0.54*** (2.94)	-0.46 (-0.98)	-----	-----	322.35 (0.45)	-----
Rdi^2	**-0.17*** (-2.98)	----	-----	-----	-----	-----
sci	-----	-----	**59.55*** (2.99)	**0.94*** (3.97)	-----	-0.0002 (-0.34)
Ki	**0.36*** (4.34)	0.06 (0.97)	-----	-----	**15.39**** (1.89)	-----
Fptr	0.002 (0.76)	**-0.91***** (-1.69)	-----	-----	-100.15 (-0.53)	-----
Fptr^2	-----	-----	-----	-----	-----	-----
Impr	**0.08*** (5.45)	**0.0005*** (3.06)	-----	-----	**0.18*** (5.22)	-----
Impr^2	----	**-1.18*** (-3.05)	-----	-----	**-0.00003*** (-5.27)	-----
Fortech	-----	-----	**-13.75**** (-2.35)	**2.34*** (4.91)	-----	**1.01*** (2.52)
Fortech^2	-----	-----	**2.74**** (1.90)	-----	-----	-----
Crdt	-5.26 (-0.10)	-2.33 (-0.17)	**-5.91*** (-3.31)	-0.0001 (-0.51)	-0.008 (-0.30)	0.00005 (0.48)
Crdt^2	-----	-----	**1.91*** (4.07)	-----	-----	-----
Pdtivity (Endogenous)	-0.00002 (-0.44)	**0.00001***** (1.71)	-0.002 (-0.06)	-0.00006 (-0.10)	0.009 (1.31)	-0.00001 (-0.29)
Wald Chi Square	183.37*	24.44**	108.27*	58.17*	47.86*	53.37*
Number of Observations	**1473**	**777**	**326**	**154**	**596**	**143**

Note: 1. z values are provided in parentheses 2. * denotes 1% level of significance, ** denotes 5% level of significance, *** denotes 10% level of significance.

Apart from ownership and firm heterogeneity, other firm specific factors including size and age of firms are also important in explaining differences in firm-level export performance. Firm size measured in terms of the share of firm sales to industry sales turns out to be significant in positively impacting on firm-level export

performance of chemicals, food and beverages and metal industries, while that for the other industries size do not have any impact on exports. It is thus important to note that larger firms in an industry have higher export intensity. The relationship across industries is however linear which is not in conformity with Kumar and Siddharthan (1994) and Bernard and Wagner (2001). The estimation results further show that age of the firm, measured in terms of number of years in operation since inception plays a significant role in determining firm-level export performance of the medium-low technology industries like metals and metal products and high technology industries like chemicals and transport equipments. This suggests that older firms have acquired the capability to penetrate the world market particularly for the high technology sectors. However, for firms in industries like machinery and low technology sectors like textiles and food and beverages, the relationship between age and export intensity remains insignificant. The older firms in the machinery sector which started operations perhaps during import substitution cater to the domestic market. This pattern is despite wide ranging reforms. This result is in conformity to the findings of Kumar and Pradhan (2003) suggesting that older firms in low technology as well as machinery industries concentrate more on the domestic market during post reform.

Technology factors are also important in attaining international competitiveness. Dependence on imported technology for export competitiveness is evident. Import of raw materials, capital goods and foreign technical knowhow by firms is one of the major sources of acquiring knowledge from rest of the world and in achieving cost competitiveness by using frontier technology and cheaper inputs. These impact on export intensity positively (see Table 4.1). Disembodied foreign technology aids the process. For chemicals, machinery and textiles, import of raw materials has significant positive impact on firm-level export intensity. This is according to expectations as most industries except textiles are knowledge-based industries and they crucially depend on imported raw materials to be globally competitive. A significant non-linear relationship exists between import of raw materials and export intensity in case of machinery and textiles.

Import of capital goods is another important way to bring in global frontier knowledge in embodied form, while import of foreign technology brings in foreign design, technological expertise and knowledge in disembodied form. It is evident from the above results that import of capital good has a positive impact on export performance of chemicals and textiles. The relationship however does not hold true for other sectors. Further, import of technology in disembodied form does not play any role in explaining export performance across sectors. It is striking to note that import of foreign technology has a significant negative impact on exports of machinery, which calls for a careful scrutiny. Again, imported embodied and disembodied technology together plays an important role in explaining the export performance of transport equipment, food and beverages and basic metal industries. While the relationship is non-linear for transport equipments, it is linear for the other two sectors.

In contrast to the findings of Hughes (1986), the results show that R&D intensity does not have significant impact on firm-level export performance in most Indian industries. The relationship is however non-linear and statistically significant in case of chemicals. As chemicals industry is knowledge-based, research and development turns out to be significant along with technology imports. R&D and technology imports play a complementary role in acquiring global competitiveness. This result is in line with the perception that building up of technological capabilities is essential for gaining international competitiveness.

Credit availability also does not impact on the exporting behavior of Indian manufacturing. The trade-finance linkage empirically suits well only for transport equipment industry. This may be because of the fact that many joint ventures have been set up in transport equipment industry with foreign technical and financial collaboration during post reforms. We also find presence of non-linearity in the relationship between credit availability and export performance in this sector.

The above results are subject to interpretations. The result of no observed difference in export performance of foreign and domestic firms is despite improvements in export performance for both categories of firms in the same

sector (see Section II). This is likely on account of the foreign and domestic firms exporting in two different segments of the industry. This study however does not capture whether domestic and foreign firms are exporting in different segments within the same industry groups on account of lack of disaggregated data.

Other explanations to the result of no difference in performance can also be put forth. With FDI inflows, the monopolistic advantage of foreign firms is lost on account of easy access to standardized technology, and in such cases, foreign firms are unlikely to outperform the domestic firms in terms of export performance. Further, MNEs plan their operations worldwide with the parent firm often discouraging export activities of subsidiaries or affiliates if such export is perceived to be competitive with operations in other locations. For the foreign subsidiaries, the strategy of the parent firm is important. This is particularly true for goods embodying high technology (Lall and Streeten, 1977) as well as when the MNE and its affiliates are horizontally integrated. The basic strategy in such cases might not just be efficiency seeking but domestic market seeking. In presence of tariff, the foreign firms often produce in the host country to capture the domestic market. They often do not have the incentive to use the host country as export platform. The domestic firms, on the other hand, being edged out in the domestic market might explore foreign markets or to end customers. This might as well explain why despite high productivity, better technological know-how and R&D, and better ability to bear sunk cost, foreign ownership of firms does not explain firm-level export intensity.

Along with the result of no significant difference in ownership-wise export performance, the factors that underlie export performance across the two categories of Indian firms can be different. Dynamic panel data estimation is carried out using Equation 3.2. The estimation results showing the determinants of firm-level export performance for domestic and foreign firms separately are presented in Tables 4.2. Significant path dependence is noted for both domestic and foreign firms in Indian manufacturing with regards to exporting. It implies that

firms already experienced in exporting are likely to export irrespective of their ownership.

The estimation results suggest that size of firms matter for domestic firms, while firm size is found to be insignificant for foreign firms to export. Similar is the case with age of the firms. Further, imported raw material is found to be a very important factor for domestic and foreign firms alike in explaining exports in Indian manufacturing. A significant non-linear relationship holds for the domestic firms in this case. Similar is the case of credit availability of firms which significantly explains export intensity of both foreign owned and domestically owned firms. However, non-linearity holds for domestic firms only. Expenditure incurred by the firms in terms of marketing, advertising and distribution plays significant role in explaining export intensities of firms irrespective of ownership. Interestingly, non-linear relationship holds for the foreign firms in this case. Productivity implying heterogeneity of firms explains export performance of both foreign and domestic firms significantly. Importantly, Research and Development is significant for domestic firms while insignificant for the foreign firms. Non-linearity holds good in this relationship as well for the domestic firms. Import of foreign technology (both embodied and disembodied) significantly explains the export intensity of domestic firms. This is indicative of a complementary relationship between imported technology and local R&D efforts for exports from domestically owned firms. On the contrary, we find a

Table 4.2: Factors determining firm-level export performance of domestic and foreign firms

Explanatory Variables	**Domestic firms**	**Foreign firms**
Expi $_{t-1}$	**0.29*** (2602.58)	**0.30**** (2.79)
Size$_t$	**11.17*** (58.97)	0.72 (0.32)

Age_t	**23.00*** (389.10)	0.006 (.080)
$Impr_t$	**0.010*** (15.71)	**0.006**** (1.19)
$Impr_t^2$	**-2.10*** (-17.09)	
$Mktcost_t$	**34.10*** (162.53)	**-18.23*** (-3.94)
$Mktcost_t^2$		**24.31*** (3.53)
Rdi_t	**132.52*** (646.25)	2.92 (1.21)
Rdi_t^2	**-882.68*** (-2329.41)	
$Pdtivity_t$	**0.002*** (3.10)	**0.009***** (0.80)
$Crdt_t$	**-0.43*** (-242.93)	**0.874*** (3.11)
$Crdt_t^2$	**0.002*** (135.97)	
$Fortech_t$	**1.94*** (23.27)	**-6.74**** (-2.44)
Sargan test Chi Square	172.01	13.13
Number of observations	1538	256

significantly negative relationship between imported technology and export intensity of the foreign firms. This may be because of the fact that the MNEs have access to the parent firm's technology meant largely to seek the domestic market. Hence expenditure on imported technology does not promote exports for foreign firms. Rather imported raw materials and expenditure costs incurred on marketing, advertising and distribution are the determining factors for export performance of these firms.

In sum, though foreign ownership does not play significant role in explaining firm-level export performance across sectors in Indian manufacturing, there are ownership specific factors that explain exports at the firm-level. Heterogeneity explained in terms of capability to bear sunk costs propels export performance in

Indian manufacturing. Productivity, though, does not play an important role across sectors, significantly explain exports across ownership pattern. Imported raw materials are important to attain international competitivess.

Conclusions and Implications for Policy

In this paper an attempt is made to understand the role of foreign direct investment in determining firm-level export intensity in Indian manufacturing since 1991. MNE operations in emerging market economies like India are expected to expand output and accelerate exports. Further, in host nations, MNEs are often instrumental in a variety of spillovers, including export to domestic firms[16]. It has been increasingly recognized that presence of foreign firms contributes, directly or indirectly, to the export performance of the host country. Literature suggest that apart from ownership, factors like firm-heterogeneity explained in terms of productivity and the capacity to bear sunk costs of exporting significantly explain export performance at the firm-level. This paper estimates the determining factors of firm-level export performance of Indian manufacturing during post reforms. In doing so, particular attention is given to the impact of firm ownership after controlling for various supply-side factors including firm heterogeneity.

This study reveals that in conjunction with growing FDI inflows, average export intensity experienced a rising trend across sectors. Export intensities of sectors like food and beverages, textiles, chemicals, metal and metal products, machinery and transport equipment has been rising since 1991, in particular after 2000. Such stylized facts led to inquire into, in particular, whether exports have responded to presence of foreign firms in the manufacturing sector. Again, as domestic and foreign firms are likely to be guided by different motives, the factors underlying the two sets of firms are estimated separately in this study. Hausman-Taylor and Dynamic Panel Data estimation techniques are used for export determination.

[16] *Feenstra (2006) provides an in-depth analysis of the effects of FDI, activities of MNEs in particular, in developing countries. Ghosh (2016), in a separate analysis, looks into export spillovers from foreign to domestic firms.*

Evidence from estimation results show that foreign ownership does not have any effect on firm-level export performance across sectors in Indian manufacturing. This is an interesting result which contradicts the common contention based on cross-country evidence that MNE operations promote export performance. This is probably, among other explanations, on account of domestic market seeking behavior of most manufacturing MNEs investing in India rather than using India as an export platform. Firm-heterogeneity explained in terms of bearing sunk costs of exports is an important determining factor, while productivity is not. As the focus of foreign subsidiaries is primarily on domestic market even in sectors like chemical and machinery, export intensity is not explained by foreign ownership despite higher productivity. However, separate panel data estimation results for domestic and foreign firms reveal that factors like imported raw materials, marketing costs and credit availability explain firm-level exports across ownership pattern. Heterogeneity of firms explained in terms of both productivity and sunk costs conforms to the theoretical and empirical understanding of firm heterogeneity explaining exporting behavior of both domestic and foreign firms in India. With liberalization, the manufacturing industries have become internationally competitive with the import of raw materials, capital good and technical know-how. This is also true across sectors. The results have significant implications for policy in terms of development of resource base and use of inputs, R&D and skill, and infrastructure, which necessarily promote exports. Moreover, as the study reveals that India is attracting FDI which is domestic market seeking as against efficiency-seeking, it calls for important policy prescriptions with regards to FDI and exports.

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APPENDIX

Table A1: Average Export Intensity in Chemicals Industry: Pre- and Post-2000

Sub-sectors	Export intensity	
	Pre 2000 average	**Post 2000 average**
Cosmetics	0.09	0.11
Dyes & Pigments	0.23	0.32
Drugs & Pharmaceutical	0.14	0.29
Other Chemical	0.07	0.12
Pesticides	0.09	0.22
Inorganic chemicals	0.05	0.11
Lubricants	0.02	0.08
Organic Chemical	0.08	0.19
Plastic Films	0.11	0.24
Plastic Packaging	0.06	0.12
Plastic Tubes & Sheet	0.12	0.13
Polymer	0.03	0.17
Refinery	0.03	0.08
Rubber & Rubber Products	0.09	0.21
Tyres & Tubes	0.08	0.10

Source: Calculations based on PROWESS database, CMIE.

Table A2: Average Export Intensity in Non-Electrical Machinery Industry: Pre- and Post-2000

Sub-sectors	Export intensity	
	Pre 2000 average	**Post 2000 average**
General Purpose Machinery	0.06	0.11
Industrial Machinery	0.08	0.16
Machine Tools	0.17	0.19
Other Industrial Machinery	0.02	0.07
Prime Movers	0.06	0.08
Tractor	0.02	0.05

Source: Calculations based on PROWESS database, CMIE.

Table A3: Average Export Intensity in Electrical Machinery Industry: Pre- and Post-2000

Sub-sectors	Export intensity	
	Pre 2000 average	**Post 2000 average**
Wires & Cables	0.03	0.05
AC & Fridge	0.01	0.04
Domestic Electrical	0.05	0.03
Dry Cells	0.02	0.04
Generators	0.07	0.09
Miscellaneous Electricals	0.06	0.12
Storage Batteries	0.06	0.05

Source: Calculations based on PROWESS database, CMIE.

Table A4: Average Export Intensity in Electronics Industry: Pre- and Post-2000

Sub-sectors	Export intensity	
	Pre 2000 average	**Post 2000 average**
Communication Equipment	0.02	0.02
Computer, Peripherals, Storage devices	0.10	0.22
Consumer Electronics	0.03	0.03
Other Electronics	0.05	0.10

Source: Calculations based on PROWESS database, CMIE.

Table A5: Average Export Intensity in Ferrous Metals Industry: Pre- and Post-2000

Sub-sectors	Export intensity	
	Pre 2000 average	**Post 2000 average**
Casting & Forging	0.11	0.16
Metal Product	0.11	0.11
Pig Iron	0.04	0.04
Steel	0.07	0.12
Steel, Tubes & Pipes	0.08	0.17

Source: Calculations based on PROWESS database, CMIE.

Table A6: Average Export Intensity in Non Ferrous Metals Industry: Pre- and Post-2000

Sub-sectors	Export intensity	
	Pre 2000 average	**Post 2000 average**
Aluminum & Aluminum Products	0.15	0.27
Copper & Copper Products	0.02	0.27
Other Non-Ferrous Products	0.02	0.14

Source: Calculations based on PROWESS database, CMIE.

Table A7: Average Export Intensity in Food & Beverages Industry: Pre- and Post- 2000

Sub-sectors	Export intensity	
	Pre 2000 average	**Post 2000 average**
Bakery	0.04	0.01
Beer & Alcohol	0.02	0.01
Cocoa & Confectionery	0.01	0.01
Coffee	0.26	0.64
Dairy Products	0.08	0.07
Floriculture	0.10	0.37
Marine Food	0.71	0.87
Milling Product	0.03	0.12
Other Agro Product	0.38	0.32
Poultry & Meat Product	0.41	0.57
Processed & Packaged Food	0.20	0.34
Starch	0.03	0.06
Sugar	0.01	0.04
Tea	0.16	0.13
Tobacco	0.09	0.07
Vegetable Oil & Product	0.09	0.09

Source: Calculations based on PROWESS database, CMIE.

Table A8: Average Export Intensity in Textile Industry: Pre- and Post-2000

Sub-sectors	Export intensity	
	Pre 2000 average	Post 2000 average
Cloth	0.18	0.16
Cotton & Blended Yarn	0.23	0.29
Other textiles	0.23	0.30
Readymade Garments	0.52	0.43
Synthetic textile	0.06	0.10
Textile Processing	0.05	0.13

Source: Calculations based on PROWESS database, CMIE.

Table A9: Average Export Intensity in Transport Equipment Industry: Pre- and Post- 2000

Sub-sectors	Export intensity	
	Pre 2000 average	Post 2000 average
Two & Three wheelers	0.04	0.04
Auto Ancillary	0.15	0.15
Commercial Vehicle	0.08	0.07
Other Transport Equipment	0.03	0.06
Passenger Cars & Multi-utility Vehicle	0.05	0.06

Source: Calculations based on PROWESS database, CMIE.

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