Foreign Investment and Productivity: A Study of Post-reform Indian Industry

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Abstract:
The paper uses panel data for Indian industries in the post-reform period to study the direct and indirect productivity effects at firm level generated by foreign investment. It finds no evidence that foreign investment directly increases firm-level productivity, nor that R&D spending is more productive in firms or sectors with higher foreign investment. It however finds strong evidence that local firms benefit from foreign investment in their industries. These benefits are higher for larger firms and those that do more business domestically.

Keywords: Transnational Corporations; Foreign Investment; Technology Spillover; Indian industries.

JEL Classification: F23; L20

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1. Introduction

Recent years have seen significant increase in the flow of direct foreign investment (DFI) into developing economies. Given its scale compared to host developing economies, DFI inflows are expected to have significant impact on the industrial structure of host countries. The literature on Transnational Corporations (TNCs) observes that their ownership of assets such as technology, marketing, management, and networks benefit developing economies through a process of spill-over (Caves, 1996, Dunning, 1981). Property rights on intangible assets being underdeveloped, they are partially public goods and others can use assets developed by one firm at a small cost. If local firms, through deliberate effort or spillover, obtain the superior practices of TNCs, it would improve industrial efficiency in host countries. If TNCs help faster diffusion of new technology (Teece, 1977; Gonclaves, 1986, Kokko, 1994), then it also leads to important industrial policy implications for the host country governments (Aitken and Harrison, 1999).

Though there are notable exceptions[2], a large part of the literature on the actual experience of industries in host countries is based on case studies whose qualitative methods usually present mixed evidence (eg. Mansfield and Romeo, 1980; Rhee and Belot, 1989). Availability of panel data across industries for some countries now makes it possible to use quantitative methods. The purpose of our paper is to examine issues related to foreign investment's contribution to productivity in the context of Indian industries, which became open to DFI following economic reforms in the late eighties. There are a number of studies on TNCs in India. Some of the earlier work eg Panth (1993), Kumar (1990), Basant and Fikkert (1996) are based on cross-section data limiting the scope of their investigations. They also mostly use pre-reform information. Our study focuses on the post-reform phase using firm level panel data across industries where significant DFI has been registered since the reforms. The data set spans over 1989 to 1999 across eleven industries that received significant DFI in post reform period. The sample covers all firms in the organized sector of respective industries giving 1132 data points with observations on inputs, sales, ownership structure and expenditures at each data point.

The study focuses on the two issues. First, whether more foreign investment embodied in a firm results in higher productivity. Though the literature does not question the technological

superiority of foreign investment by TNCs, it has been observed that such investment faces a learning curve in the host environment (Wu, 2000) and therefore may not necessarily perform better. We examine the direct productivity of foreign investment at the firm level and explore if these productivity effects are concentrated in particular industries. Secondly we try to find out if there are firm- and industry-specific attributes that might enhance these effects. A related question examined is whether R&D spending is more productive in firms and industries with larger foreign investment.

Secondly, are there externality benefits from foreign investment in an industry for firms in that industry? This so-called process of spillover can occur irrespective of whether embodied foreign investment is currently more productive or not, since the process is thought to be based on the diffusion of knowledge and practices. The issue can be broken into two separate questions. The first is whether there is at all any positive externality. This externality can benefit local firms as well as TNCs who might benefit from one another's existence. Secondly, are the benefits different as between TNCs and locals? There is a large literature on the second question and evidence appears varied. Lichtenberg and van Pottelsberghe de la Potterie (1996) found that FDI flows did not result in positive spillovers among OECD countries during 1970–1990, while Hejazi and Safarian (1996) found significant R&D spillovers from US firms to other OECD countries during the same period. In a study across 69 developing countries Borensztein, Gregorio, and Lee (1998) using data on FDI flow from OECD countries concluded that FDI had a positive effect on per capita income growth only for countries that had reached a minimum human capital threshold. A recent study by Xu (2000) corroborates this finding for spillover effects from US firms across forty countries. Studies on individual countries also return mixed conclusions. Caves, (1974) for Australia, Globerman, (1979) for Canada and Blomstrom and Persson (1983) for Mexico found positive effects of the presence of TNCs on local productivity. But Haddad and Harrison (1993) for Morocco and Aitken and Harrison (1999) for Venezuela find no evidence of spillover onto local firms. We examine the evidence on the basis of our sample. We also explore if the externality benefits are concentrated in specific industries and if there are systematic firm-level correlates that influence the ability of firms to take advantage of the externality created by foreign investment in the industry to which they belong.

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[2] *Inter alia*, Caves, 1974 (Australia); Blomstrom and Persson,1983 (Mexico); Blomstrom,1986 (Mexico); Blomstrom and Wolff, 1989 (Mexico); Branstetter, L.G., 2000 (U.S); Aitken and Harrison, 1999 (Venezuela).

Section 2 describes the methodology of the work. Section 4 discusses the data, empirical exercises and results. Section 5 concludes with a summary.

2. Methodology

The contribution of intangible assets introduced through foreign investment in a firm[3] is expected to show in its total factor productivity. Similarly if there are externalities for the industry then the amount of foreign investment in an industry should register in the factor productivity of firms in that industry. Both these effects can be nested in a suitably augmented production function at the firm level. We augment the production function of a firm with foreign investment in it and the amount of foreign investment in the industry to which it belongs. Foreign investment in the firm and in the industry to which it belongs are thus treated as virtual inputs. We have used a logarithmic form so that suppressing firm and time identifiers the production function is

(1) $q = \alpha + \beta' \mathbf{(D)} + \gamma' .\mathbf{(i)} + \gamma_1 .FE + \gamma_2 .FP + \varepsilon$

where q is the logarithm of output, **(i)** is a vector of the logarithm of production inputs, *FE* is the percentage of foreign equity holding in the firm and *FP* is a measure of foreign presence in the industry explained below. The random term ε is assumed to have a normal distribution with zero mean and fixed variance over the sample. **(D)** is a 10×1 vector of industry dummies for capturing industry-specific intercepts.

γ_1 is the effect of a firm's foreign equity holding on its productivity.

To probe if the productivity enhancing effect of foreign investment is different across industries (1) is augmented by an interactive term:

(2) $q = \alpha + \beta' \mathbf{(D)} + \gamma' .\mathbf{(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE.\mathbf{(D)} + \varepsilon$

In (2), γ_3' is a vector of coefficients that would indicate effects of firm-level foreign investment differentiated by industry.

γ_2 measures the effect of the presence of foreign investment in the industry to which a firm belongs. To examine if firms with different foreign equity levels benefit from this effect differently, we add the interactive variable *FE*FP* in equation (2):

(3) $q = \alpha + \beta' \mathbf{(D)} + \gamma' .\mathbf{(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE.\mathbf{(D)} + \gamma_4 .FE*FP + \varepsilon$,

[3] Assets in this catergory are technology, managerial practice, patents, brand names, marketing networks, etc. There is a view that foreign invstment tends to flow into knowledge-intensive industries where intangible assets are more significant and provide TNCs with relative advantage (Dunning, 1981, Caves, 1996).

where a negative γ_4 would imply positive externality benefits of foreign investment in an industry for local firms in that industry. Later on in place of *FE*FP* in (3) a number of alternative interactive terms are used to explore if the ability to benefit from foreign investment externality depends on any other firm-level attribute or the nature of the industry. These equations are:

(4) $q = \alpha + \beta' \mathbf{(D)} + \gamma' \mathbf{.(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE^{*}\mathbf{(D)} + \gamma_4 .FP^{*}\mathbf{(D)} + \varepsilon$ Industry dummies.

(5) $q = \alpha + \beta' \mathbf{(D)} + \gamma' \mathbf{.(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE^{*}\mathbf{(D)} + \gamma_4 . RD^{*}FP + \varepsilon$ *RD* = R&D/sales.

(6) $q = \alpha + \beta' \mathbf{(D)} + \gamma' \mathbf{.(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE^{*}\mathbf{(D)} + \gamma_4 . IM^{*}FP + \varepsilon$ *IM* = import/sales.

(7) $q = \alpha + \beta' \mathbf{(D)} + \gamma' \mathbf{.(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE^{*}\mathbf{(D)} + \gamma_4 .EX^{*}FP + \varepsilon$ *EX* = export/sales.

(8) $q = \alpha + \beta' \mathbf{(D)} + \gamma' \mathbf{.(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE\mathbf{.(D)} + \gamma_4 .SZ^{*}FP + \varepsilon$ *SZ* measures firm size defined below.

(9) $q = \alpha + \beta' \mathbf{(D)} + \gamma' \mathbf{.(i)} + \gamma_1 .FE + \gamma_2 .FP + \gamma_3' . FE\mathbf{.(D)} + \gamma_4 .VI^{*}FP + \varepsilon$ *VI* is a measures of vertical integration defined below.

Variables tried out in equations (4) to (9) are shown against the equations. R&D expenditure and the size of a firm are often suggested to directly influence the ability of a firm to take advantage of available industry-level pool of knowledge and practices. Larger vertical integration of production and lower import intensity imply that a larger share of the firm's activity can potentially benefit from technology absorption. Larger proportion of export to total sales is expected to put pressure to remain internationally competitive and motivate technology absorption.

Besides these equations, a number of other regression equations have been estimated to take some of the queries to specific directions, and will be reported in the appropriate place.

Data: Data is sourced from the Confederation of Indian Industry and the Centre for Monitoring the Indian Economy. Industries are: airconditioners, auto ancillaries, communication equipment, electronic process control, light commercial vehicles, motor cycles, motors and generators, passenger cars, refrigerators, tyres and tubes, washing machines. Table 1 describes the sample.

Table 1 here

Variables:

1. q = logarithm of value added

2. (**i**) = (log$K$, log$L$). K is measured by the value of plants and equipment and L is proxied by wages and salary.

3. (**D**) industry dummies. Table 1 provides the industry identification of each dummy.

4. FE = percentage of foreign equity in a firm.

5. FP = a measure of foreign investment presence in an industry. We have used three alternative measures. The first is $\frac{\sum F_i K_i}{\sum K_i}$ over all firms in the industry. F_i is the share of foreign equity in total equity of firms. The second and the third replace K with L and value added respectively. All three measures have sufficient sample variance and are not significantly correlated with primary variables of the system[4].

6. RD = R&D expenditure of a firm as percentage of its total sales.

7. IM = import of intermediate and capital goods as percentage of sales.

8. EX = exports as percentage of sales.

9. SZ = firm's share of total industry sales as percentage.

10. VI = value added as percentage of sales.

3. Empirical Results

Empirical results are summarized in Table 2. Column 1 refers to the equation number in the same sequence as presented in section 2. Column 2 shows the right hand side variables in the regression equation. The third column states the adjusted R^2 in parenthesis and mentions the variables significant at 5 per cent level[5]. A (-) sign indicates the estimated coefficient is negative; D_i indicates that some of the dummies are significant, positive or negative; and X*D_i, where X is any variable, indicates that some elements of X*(**D**) are significant, positive or negative. In all other cases the coefficient is positive. For each estimated equation three measures of FP are used. The third column states if the measure is based on plant and equipment, labor or value-added. The three sets of estimates produce identical qualitative conclusions for all but two equations.

[4] Since firms with more foreign investment are expected to be more capital intensive, the measure of FP based on plant and equipment was expected to be higher than that based on labor. But the computed serieses do not display this property.

[5] All references to the level of significance in the text are at 5 per cent or lower level.

Table 2 here

Foreign Investment in a Firm and its Productivity:

Estimates of equation (1) show that at the overall sample level there is no evidence that more foreign investment in a firm leads to higher productivity. Equation (2) tries to examine if there are particular industries where these effects may be concentrated. In the estimate of equation (2) four industries return significant coefficients for *FE**(**D**)[6], of which only two are positive. These two industries are both characterized by a small number of firms and relatively large foreign presence, while the two with negative coefficients have a very large number of firms with much smaller foreign presence. However, a general statement that higher foreign investment in firms generates comparatively higher productivity in industries with large foreign presence is not true. Estimates of equation (3) show that the opposite is true.

We also explored the related question whether foreign investment in a firm or in its industry of membership increases the effectiveness of its R&D spending. The evidence is that the contrary is true. In regression estimates of *q* on {(**i**) (**D**), *RD, FE*RD*} and on {(**i**) (**D**), *RD, FP*RD*} the coefficients of *FE*RD* and *FP*RD* are significant but negative. Thus the sample provides evidence that R&D activity is more productive in firms with smaller foreign holding and industries with smaller foreign presence[7]. There are two plausible explanations for this. A plausible explanation of the finding is that firms with higher foreign investment undertake their more serious R&D expenditures at their parent organisations abroad. Spendings on R&D in the host country may be of more minor nature, and thus less contributive to productivity than those of local firms. However this is a tentative hypothesis and our present study is not designed to probe into this possibility. Secondly, local firms have to invest in R&D to be able to compete with multinational firms and also to be able to absorb the positive spillovers. In other words, R&D investment by local firms determines their absorbtive capacity.

It might be possible that foreign investment contributes to firm level productivity conditional on some firm- and /or industry-level attribute and thus the effect remains obscure at the overall

[6] Unless otherwise qualified statements like this will mean that it is true for estimates using all three definitions of *FP*.

[7] The regression of *q* on {(**i**) (**D**), *RD, FE*RD, FP*RD*} does better than both of these equations on *F*-test, and produces the same qualitative conclusion.

sample level. A number of exercises were done to probe this possibility. The best in-sample predictor equation is a regression of q on {**(i)** (**D**), *IM, FE*IM*}, and it returns significant negative coefficients for *IM* and *FE*IM*. Local firms, which depend mostly on locally produced materials benefit more by copying practices of and from the spillovers from multinational operations than local firms that are highly import intensive. We will report below that a similar observation holds for the productivity of industry-level investment, too.

Firm-level Productivity and Foreign Investment in the industry:

Though equation (1) shows no evidence that an industry's *FP* generates productivity gains for firms in that industry at the overall sample level, significant negative coefficient of *FE*FP* in equation (3) implies that firms with lower foreign investment (tentatively, locals) gain from foreign investment in their industry of origin. Equation (4) tries to break up the overall effect across industries, and examines if it is concentrated in particular industries. The only industry where it is unambiguously concentrated is tires and tubes, which has a large number of firms with relatively small foreign presence. Thus the overall effect in the sample seems to be distributed across industries.

Are there firm level attributes that help local firms to access more of this effect? Equation (5) shows that the firm's own R&D effort is not one of such attributes, and equation (8) shows that size of the firm matters. Equations (6) and (7) show that the effect is significantly correlated with the firm's imports and exports as percentage of sales. But contrary to expectations, firms that buy more from and sell more to the domestic market enjoy more of the benefits of industry-level foreign investment. This is an interesting finding. We should add that equations (6) and (7) are the best in-sample predictors of log q among all the equations estimated here. It is also noteworthy that equation (9) fails to return a significant coefficient for the level of vertical integration of the firm. Note that by definition:

$VI = 1 - IM -$ (domestic purchase/sales).

The significant coefficient of *IM* in (7) and the failure of *VI* to be a significant regressor in (9) imply that it is the share of domestic inputs in a firm's sales that matters, and not the share of its own production. Findings from equations (6) and (7) can be summarized as an aphorism: firms that do more business at home get more benefit from foreign investment.

5. Conclusion

The paper examines Indian industrial data for her post-reform era and reports that some *a priori* expectations about the contributions of foreign investment do not hold for the period 1989-99. There is no evidence that foreign investment is directly more productive than domestic investment. The effectiveness of R&D spending is higher for firms and industries with more domestic rather than foreign investment.

Regarding externalities, there is evidence of spillover to domestic firms. It is found that firms with more domestic ownership derive more benefit from industry level foreign investment than firms with more foreign investment. The results show that larger firms are able to absorb the spillovers more effectively than smaller firms. Finally firms that do more domestic business, both buying inputs at home and selling in the domestic market, tend to derive more externality benefits from the industry's foreign investment. This finding is interesting and also logically consistent. Local firms that are highly outward oriented through imports and exports derive externalities associated with international trade. However, local firms, which depend mostly on locally produced materials (inward oriented) benefit more by copying practices of and from the spillovers from multinational operations in a developing economy context.

The paper has incorporated industry and firm specific factors in understanding the issue of spillovers. An interesting extension could be addressing the issue of whether local firms in industries that operate in technologically dynamic clusters are able to reap the spillovers of foreign direct investment more effectively than in dispersed industries (Baptista 2000).

References

Aitken, B and A. Harrison, 1999, Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela, *American Economic Review*, vol. 89, No. 3, 605-18.

Baptista, R, 2000, `Do Innovations Diffuse Faster Within Geographical Clusters ?' International Journal of Industrial Organization, 18, 515-535.

Basant, R and B.Fikkert, 1996, `The Effects of R&D, Foreign Technology Purchase, and Domestic and International Spillovers on Productivity in Indian Firms,' Review of Economics and Statistics, 78 (2), 187-99.

Blomstrom, M. and Persson, H., 1983, `Foreign Investment and Spillover Efficiency in an underdeveloped Economy: Evidence from the Mexican Manufacturing Industry', *World Development*, 11(6), 493-501.1983;

Blomstrom, M., 1986, 'Foreign Investment and Productive Efficiency: The Case of Mexico'. *Journal of Industrial Economics*, September, 35(1), 97-110.

Blomstrom, M.and Wolff. E. W., 1989, 'Multinational Corporations and Productivity Convergence in Mexico'. Mimeo, *New York University*.

Borensztein, E., Gregorio, J., Lee, J., 1998, `How does foreign direct investment affect economic growth', *Journal of International Economics,* 45, 115–135.

Branstetter, L.G., 2000, Is Foreign Direct Investment a Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States' Dept of Economics, University of California, Davis.

Caves, R.E., 1996, *Multinational enterprise and economic analysis,* Cambridge University Press, Cambridge.

Caves, R.E., 1974, 'Multinational Firms, Competition and Productivity in Host-Country Markets' *Economica*, 41 (162), 176-93.

Dunning, J. H, 1981, *International Production and the Multinational Enterprise*, London, George Allen and Unwin.

Globerman, S., 1979, `Foreign direct investment and ''spillover'' efficiency benefits in Canadian manufacturing industries' Canadian Journal of Economics 12, 42–56.

Gonclaves, R., 1986, 'Technological Spillovers and Manpower Training: A Comparative Analysis of Multinational and National Enterprises in Brazilian Manufacturing', *Journal of Development Economics*, 11(1), 119-32.

Haddad, M., Harrison, A., 1993, `Are there positive spillovers from direct foreign investment? Evidence from panel data for Morocco,' *Journal of Development Economics* 42, 51–74.

Hejazi, W., Safarain, E., 1996, `Trade, investment and United States R&D spillovers' Working Paper No. 65, The Canadian Institute for Advanced Research.

Kokko, A., 1994., 'Technology, market characterstics, and spillovers', Journal of Development Economics, 43, 279-293.

Kumar, N, 1990, *Multinational Enterprises in India*, New York, Routledge.

Lichtenberg, F., van Pottelsberghe de la Potterie, B. 1996, `International R&D spillovers: a re-examination',. NBER Working Paper No. 5668, Cambridge, MA.

Mansfield, E and Romeo, A, 1980, 'Technology Transfer to Overseas Subsidiaries by U.S.-Based Firms.' *Quarterly Journal of Economics*, December, 95(4). 737-50.

Panth, M., 1993, 'Transnational corporations and the manufacturing sector: A case study of Indian industry', *Indian Economic Review*, January-June.

Rhee, J. W. and Belot, T., 1989 'Export Catalysts in Low Income Countries'. Working Paper, *World Bank*.

Teece, David J., 1977, 'Technology Transfer by Multinational Firms: The Resource Cost of Transfering Technological Know-how', *Economic Journal*, 242-61.

Xu Bin, 2000, Multinational enterprises, technology diffusion and host country productivity growth, *Journal of Development Economics*, Vol. 62 477–493.

Wu Yanrui 2000, Measuring the performance of foreign direct investment: a case study of China, *Economics Letters* 66 (2000) 143–150.

Table 1: The Sample

Industry	Identifying Dummy	Number of firms	Number of data points
Airconditioners	D1	5	54
Auto Ancillaries	D2	24	264
Communication Equipment	D3	22	227
Electronic Process Control	D4	5	52
Light Commercial Vehicles	D5	6	72
Motor Cycles	D6	4	48
Motors and Generators	D7	6	66
Passenger Cars	D8	10	68
Refrigerators	D9	4	47
Tyres and Tubes	D10	19	197
Washing Machines		5	37

Table 2: Empirical Results

Equation 1	α , (**D**) ,*K, L, FE, FP*	(0.8986) α, D_i, *K,L*	Plant
		(0.8997), α, D_i,*K, L*	Labour
		(0.8984); α, D_i,*K, L*	Value added
Equation 2	α, (**D**), *K, L, FE, FP, FE**(**D**)	(0.9061) α, D_i, *K, L, FE*Di*	Plant
		(0.9059), α, D_i,*K, L, FE*Di*	Labour
		(0.9077); α, D_i, *K, L, FE*D_I*	Value added
Equation 3	α, (**D**), *K, L, FE, FP, FE**(**D**), *FE*FP*	(0.9071) α, D_i,*K, L, FE*, (-)*FE*FP, FE*Di*	Plant
		(0.9076) α, D_i, *K, L, FE*, (-)*FE*FP, FE*D_I*	Labour
		(0.9082); α, D_i,*K, L, FE*, (-)*FE*FP, FE*D_I*	Value added
Equation 4	α, (**D**), *K, L, FE, FP, FE**(**D**), *FP**(**D**)	(0.9067) α, D_i, *K, L*, (-)*FP, FE*Di, FP*D_I*	Plant
		(0.9098); α, D_i,*K, L*, (-)*FP, FE*Di, , FP*D_I*	Labour
		(0.9081); α, D_i, *K, L*, (-)*FP, FE*D_i, FP*D_I*	Value added
Equation 5	α, (**D**), *K, L, FE, FP, FE**(**D**), *FP*RD*	(0.9062) α, D_i, *K, L, FE*Di*	Plant
		(0.9061); α, D_i,*K, L*, (-)*FP*RD, FE*D_I*	Labour
		(0.9060); α, D_i, *K, L*, (-)*FP*RD, FE*D_I*	Value added
Equation 6	α, (**D**), *K, L, FE, FP, FE**(**D**), *FP*IM*	(0.9115) α, D_i,*K, L*, (-)*FP*IM, FE*D_I*	Plant
		(0.9113) *;* α, D_i, *K, L*, (-)*FP*IM, FE*D_I*	Labour
			Value added
		(0.9112*);* α, D_i,*K, L*, (-)*FP*IM, FE*D_I*	
Equation 7	α, (**D**), *K, L, FE, FP, FE**(**D**), *FP*EX*	(0.9126) α, D_i,*K, L*, (-)*FP*EX, FE*D_I*	Plant
		(0.9128); α, D_i,*K, L*, (-)*FP*EX, FE*D_I*	Labour
		(0.9123); α, D_i,*K, L*, (-)*FP*EX, FE*D_I*	Value added
Equation 8	α, (**D**), *K, L, FE, FP, FE**(**D**), *FP*SZ*	(0.9063) α, D_i,*K, L*, (-)*FP, FP*SZ, FE*D_I*	Plant
		(0.9065); α, D_i,*K, L, FP*SZ, FE*D_I*	Labours
		(0.9061): α, D_i,*K, L, FP*SZ, FE*D_I*	Value added
Equation 9	α, (**D**), *K, L,FE, FP, FE**(**D**), *FP*VI*	(0.9060) α, D_i,*K, L, FE*D_I*	Plant
		(0.9058); α, D_i,*K, L, FE*D_I*	Labour
		(0.9057); α, D_i, *K, L, FE*D_1*	Value added