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EXPORT GROWTH IN INDIA: HAS FDI PLAYED A ROLE?

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Abstract

Export growth in India has been much faster than GDP growth over the past few decades. Several factors appear to have contributed to this phenomenon including foreign direct investment (FDI). However, despite increasing inflows of FDI especially in recent years there has not been any attempt to assess its contribution to India's export performance- one of the channels through which FDI influences growth. Using annual data for 1970-98 we investigate the determinants of export performance in India in a simultaneous equation framework. Results suggest that demand for Indian exports increases when its export prices fall in relation to world prices. Furthermore, the real appreciation of the rupee adversely effects India's exports. Export supply is positively related to the domestic relative price of exports and higher domestic demand reduces export supply. Foreign investment appears to have statistically no significant impact on export performance although the coefficient of FDI has a positive sign.

Key Words: Exports, commercial policy, export subsidies, foreign direct investment,
exchange rates and India.

JEL Classification Codes: F1, F13, F14 and F21.

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I   Introduction

India's exports have grown much faster than GDP over the past few decades. For example, its exports have grown over 11% per annum while growth in GDP is about 5% during 1970-98 periods. Exports have grown even faster since 1945-95. Several factors appear to have contributed to this phenomenon including foreign direct investment (FDI) which has been rising consistently especially from the early 1990s. By 1997 India became the ninth largest recipient of such investment among the developing economies (World Bank, 1998:20).[1] However, despite increasing inflows of FDI there has not been any attempt to assess its contribution to India's export performance- one of the channels through which FDI affects growth.[2]

The success stories of East and South East Asian countries suggest that FDI is a powerful tool of export promotion because multinational companies (MNCs) through which most FDI is undertaken have the well established contacts and up to date information about foreign markets. However, the experience of these countries cannot be generalized to India given the lower level of infrastructure, and the rigidity in both the factor as well as commodity markets (Srinivasan, 1998). Furthermore, the role of FDI in export promotion in developing countries remains controversial and depends crucially on the motive for such investment. If the motive behind FDI is to capture domestic market (tariff-jumping

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[1]   India has experienced a substantial increase in FDI inflows from US$ 46 million in 1970 to US$ 3,351 million by 1997.

[2]   There are a few studies (Kumar, 1994 and Kumar and Siddharthan, 1993) which examine the role of FDI in India's export performance based on data until the early 1980s. However, there has been a major reform since then especially from the early 1990s. Thus, their results must be interpreted with caution. In the analysis of 43 Indian industries during 1975-76 to 1980-81 Kumar (1994) did not find any significant difference in the export-orientation of the affiliates of MNCs as compared

type investment), it may not contribute to export growth. On the other hand, if the motive is to tap export markets by taking advantage of the country's comparative advantage, then FDI may contribute to export growth. Thus, whether FDI contributes to export growth or not depends on the nature of the policy regime. By now it is well known that an outward-oriented regime encourages export-oriented FDI while an inward-oriented policy regime attracts FDI mainly to capture domestic rather than export markets (World Bank, 1993).

India has opened up its market since the beginning of the last decade (especially from July 1991) by lowering tariff and non-tariff barriers (NTBs), and liberalizing investment policy. However, by any standard India is far less open than many developing economies.[3] Furthermore, its factor market including infrastructure sector is less efficient compared with many East and South East Asian countries with whom India competes in international market (Srinivasan, 1998). Hence, it is possible to argue that even with the policy liberalization India may have failed to attract a significant amount of export-oriented FDI[4] and the export growth may have been brought about by factors other than FDI namely the real depreciation of Indian currency, improvements in price competitiveness and provision of export subsidies etc. In the light of the above debate, the aim of this paper is to examine whether or not FDI has made any significant contribution to India's export growth.

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with their local counterparts. Kumar and Siddharthan (1993) also observed similar results in the analysis of 13 Indian industries during the same period.

[3] For example, by the mid 1990s import-weighted tariff in India was 33% as compared with 9% in Korea (1985-92), 10% in Indonesia (1989-91), 10% in Mexico (1990) and 14% in Brazil (1993) (See Ahluwalia et. al, 1996).

[4] Efficient infrastructure facilities are vital in attracting efficiency-enhancing FDI in developing countries. Since there have been substantial liberalization in these countries their ability to attract efficiency-enhancing FDI depends not only on the availability of cheap unskilled labor but also on

The paper is organized as follows. Following an introduction in section I, opening up of the Indian economy and the magnitude of FDI are presented in section II. Section III discusses India's export performance. A simultaneous equation model is developed in section IV which is subsequently tested in section V. The paper concludes with concluding remarks in section VI.

II   The Opening Up of the Indian Economy and the Magnitude of FDI

(a) Foreign Investment Policy

The Industrial Policy resolution of 1948 and subsequent resolutions mark the beginning of the import-substitution (IS) era in India. Although these resolutions recognized the importance of foreign capital and technology in industrialization, the government evolved a complex legal and institutional control under the Foreign Exchange Restriction Act (FERA)[5] and Monopolies and Restrictive Trade Practice (MRTP) Act[6] to ensure a marginal and highly circumscribed role of FDI in the economy. As a corollary, the nominal ceiling on foreign equity participation was limited to 40% and FDI was largely restricted to priority industries requiring sophisticated technology, undertakings with high export-orientation and industries in which a critical production gap existed.

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the quality of infrastructure facilities which are essential for MNCs in developing integrated production system (World Investment Report 1998).

[5]   The FERA restricted foreign equity participation up to 40% with a view to controlling foreign exchange outflows arising out of dividend and royalty payments.

[6]   The MRTP Act was enacted in 1969 to control the establishment, expansion and structure of large enterprises to prevent the concentration of economic power and to curb restrictive practices. The Act discouraged growth of large industries and thus prevented economies of scale being realized.

By the early 1980s it was felt that these restrictions have discouraged foreign investment which could enhance efficiency by bringing superior technologies and better work practices. This led to some liberalization in the Industrial Policy Statements of 1980 and 1982. For example, 100% export-oriented foreign firms were exempted from 40% foreign equity restrictions and licensing procedures for MRTP companies were simplified. Furthermore, the production of leather footwear and other leather goods earlier reserved exclusively for the small-scale industries was also allowed in the large and medium-scale industries. By 1983, large industrial groups and foreign companies were no longer restricted from producing transport machinery and tools, electric equipment, chemical and pharmaceutical products, and industrial machinery.[7] By the mid 1980s, non-resident Indians (NRIs) were allowed to invest in Indian companies through equity participation. The establishment of four additional export-processing zones was announced in 1985 with a view to attracting export-oriented FDI.

A major deregulation took place in July 1991 when the government abolished the industrial licensing system, except in 15 critical industries and drastically reduced the number of industries reserved for the public sector from 17 to 6.[8] Prior government approval for the expansion and diversification of large firms including foreign firms has been ended. Foreign firms are allowed to have a major share holding and foreign investment up to a maximum of 51% equity in 35 high priority industries receives

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[7]   In October 1982, a formal agreement was signed between Maruti Udiyog Ltd, a Government enterprise, and Suzuki Motor Company Ltd. of Japan for production of a car called the "Maruti". Under the agreement for the first time foreign capital participation in an Indian public enterprise was approved with Suzuki authorized to acquired a 40% equity. In the past, foreign participation in public enterprise was permitted only in turnkey production of materials and services.

[8]   These include defense, atomic energy, coal and lignite, minerals, mining, and railway transport.

automatic approval.[9] Foreign investment is also permitted in 22 consumer goods industries, subject to conditions of dividends being plough back. The manufacturing of readymade garments, earlier reserved exclusively for the small-scale industrial undertakings, has been open to large-scale undertakings including foreign companies, subject to export obligation of 50% and investment limit of Rs. 30 million. The system of phased Manufacturing Program designed to enforce progressively higher local content no longer exits. Formerly widely used industrial location restrictions now remain to only a limited extent in large cities, based on environmental considerations.

The new investment policy also spells out more incentives to attract FDI from NRIs and overseas corporate bodies (OCBs) predominantly operated by NRIs. These include 100% share in many areas and full repatriation of profit. FDI in power generation, telecommunications, petroleum exploration, petroleum refining and marketing, transportation sectors (specifically the roads and railways, ports and shipping, and air service) has been offered special incentives by realizing the importance of these sectors for trade and industrial development. Apart from liberalization in foreign investment policy there have also been substantial reforms in trade and payment regimes.[10]

(b) Magnitude of FDI Inflows

India was one of the lowest recipients of FDI among developing countries until 1970s. During 1970s cumulative inflows of FDI was about US$454 million or 0.20% of gross

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[9]   The Reserve Bank of India quickly checks the authenticity of foreign investor seeking to invest in India as a joint venture.

[10]   See Ahluwalia (1996), Bhagwati (1993), and Joshi and Little (1994) for reforms in trade and payment regimes. Our focus is primarily on reforms in foreign investment front.

domestic investment (GDI). Many factors contributed to a lower level of FDI. One obvious factor was the restriction in foreign shareholdings of equity, which was limited to the maximum of 40% under the FERA. Lengthy approval process and restrictions in foreign participation in many areas also appear to have discouraged foreign investment. Although the absolute value of FDI rose sharply in 1980s in comparison with the earlier decade its share in GDI remained constant (see table 1). It was only in 1990s India experienced a significant inflows of foreign capital in the form of both FDI and portfolio capital. Table 1 presents India's absorption of foreign capital and its role in Indian economy.

Table 1: India's absorption of foreign capital: 1970-98 (US$ million)

Year	Total foreign capital (TFC) flows	FDI Flows	FDI % of TFC	Portfolio Capital flows	Portfolio % of TFC	External debt flows	External debt % of TFC	FDI % of Gross Dom. Invest (GDI)
1970-80	142030.6	454.5	0.3	0	0	141622.1	99.7	0.2
1981-90	484149.3	1130.0	0.2	2981.6	0.5	480037.7	99.2	0.2
1991-97	682999.3	9795.3	1.4	18466.5	2.7	654737.5	95.9	1.6
1991	86875.5	74.0	0.1	1380.1	1.6	85421.4	98.3	0.1
1992	90576.8	277.0	0.3	35.5	0.04	90264.3	99.6	0.5
1993	97189.4	550.4	0.6	2296.6	2.4	94342.4	97.1	1.0
1994	108148.1	973.3	0.9	4692.1	4.3	102482.7	94.8	1.3
1995	98342.2	2143.6	2.2	1811.2	1.8	94387.4	95.9	2.3
1996	100076.8	2426.0	2.4	4215.7	4.2	93435.1	93.46	2.7
1997	101790.5	3351.0	3.3	4035.3	4.0	94404.2	92.7	3.7

Source: Calculated from *World Development Indicators* CD ROM, World Bank, 1999.
Note: Total foreign capital includes FDI, portfolio capital and external debt. FDI and portfolio figures are net inflows. Portfolio capital included both investments in bonds and Euro-equities.

While India is not yet anywhere near ASEAN countries and far too behind China in attracting FDI, it has done remarkably well in recent years compared with its own past performance. For instance, FDI inflows reached US$ 9.8 billion during 1990-97 periods from just over a billion US$ during 1980s. By 1997 India became the 9th largest recipient

of such investment among developing countries. The share of FDI in both total foreign capital (TFC) and gross domestic investment (GDI) reached over 3% by 1997 from about one-fifth of a percent during 1970s and 1980s (see columns 4 and 9 respectively in table 1). This abrupt increase in FDI inflows appears to be due to the opening up of the Indian economy since 1991. However, investment climate in India is far less than satisfactory as reflected by a huge difference between the approved and actual inflows of FDI. For example, as of January 1999 the cumulative FDI approval was US$54 billion but the actual inflows were only US$16 billion- less than 30%. This is even lower in the infrastructure sector where only 16% of cumulative approvals translated into actual investment- telecommunications 15% and oil refining 11% (The Economists Intelligent Unit, 3rd quarter, 1999: 22). As *The Economist* (22 February 1997: 23) points out (taken from Srinivasan, 1998):

'the system simply does not work as it is supposed to. The rules may be liberal in principle…, [but] delays, complexities, obfuscations, overlapping jurisdictions and endless request for more information remain much the same as they always have been.'

In recent years portfolio capital has increased more rapidly than FDI, contributing 4% to total foreign capital inflows by 1997 (see table 1 column 6).This has occurred from 1993 when the Foreign Institutional Investors (FIIs) were allowed access to the Indian capital market. Portfolio capital inflows reached over US$4 billion by 1997 from just over a billion US$ in 1991. Nearly 50% of this investment came from the FIIS followed by Euro equities (Economic Survey, 1995/96: 97).

The sector-wise breakdown of FDI is presented in table 2. As shown until the early 1990s FDI was heavily concentrated in manufacturing. This appears to be due to a bias in favor

of IS industrialization, which may have encouraged tariff-jumping type investment to capture protected domestic market. Following the 1991 liberalization program, however, there has been a sharp rise in foreign investment in tertiary sector that encompasses critical elements of the modern economy namely telecommunication, power generation, consulting services, and hotel & tourism. The share of tertiary sector in total FDI inflows rose significantly from 5% by 1990 to about 59% during 1991-97. Increased FDI inflows to tertiary sector, especially in infrastructure and power generation, is a welcome development because this areas had long been reserved for the public sector enterprises which were inefficient in managing these services, making India's trade and industrial sector least competitive in international context.

Table 2: Sector-wise breakdown of FDI stock
(Rs = 10 million)

Industry group	March 1980		March 1990		Average annual Aug.1991-Sep. '97	
	Value	%	Value	%	Value	%
Primary	**83.1**	**8.9**	**267.0**	**9.9**	**363.2**	**0.2**
(i) Agriculture	38.5	4.1	256	9.5	0	0
(ii) Mining	7.8	0.8	8.0	0.3	363.2	0.2
(iii) Petroleum	36.8	3.9	3.0	0.1	0	
Secondary	**811.6**	**87.0**	**2298.0**	**85.0**	**95282.4**	**41.2**
(i) Food and beverages	39.1	4.2	162.0	6	14423.5	6.2
(ii) Textile	32.0	3.4	92.0	3.4	3817.1	1.6
(iii) Machinery & machine tools	71.0	7.6	354	13.0	17186.9	7.4
(iv) Transport equipment	51.5	5.5	282.0	10.0	14654.7	6.3
(v) Metal & metal products	118.7	13	141.0	5.2	12098.0	5.2
(vi) Electrical goods	97.5	10.0	295.0	11.0	7734.4	3.3
(vii) Chemical & chemical products	301.8	32	769.0	28.0	17662.7	7.6
(viii) Paper & paper products	Na	Na	Na	Na	3409.8	1.5
(ix) Rubber goods	Na	Na	Na	Na	837.4	0.4
(x) Other Manufacturing	65.5	7	Na	-	3457.6	1.5
Tertiary	**38.5**	**4.1**	**140.0**	**5.2**	**135884.5**	**58.7**
(i) Telecommunication	-	-	-	-	47196.2	20.4
(ii) Power generation	-	-	-	-	65488.1	28.3
(iii) Services	38.5	4.1	140.0	5.2	23200.1	10.0
Total	**933.2**	100	**2705.0**	100	**231530.1**	100

Sources: Computed from *Handbook of Statistics1997,* Confederation of Indian Industry
and Kumar (1994).

Following the tertiary sector, the second largest concentration of FDI has been in manufacturing attracting about 41% of such investment during 1991-97. Within manufacturing chemical and chemical products, machinery and machine tools, transport equipment, and food and beverages are the major recipients of foreign investment.

III. India's Export Performance

Two notable developments have taken place in India's export front since 1970s. First, as stated earlier its exports have grown much faster than GDP. Second, there has been a substantial change in India's export mix. Several factors appear to have contributed to these developments, namely the real depreciation of exchange rate, liberalization in investment policy especially from the early 1980s and the provision of export subsidies to reduce the anti-export bias created by the IS policy. Export subsidies took in may form- duty draw back, subsidized credit and direct subsidies- which help reduced the bias against exports.[11] Whenever the real devaluation was maintained, growth in exports continued.[12] A sharp devaluation of rupee since the early 1990s has further strengthened export growth although there was some slowdown and or declined in exports during the macro economic crisis of the early 1990s. Export growth also slow down in 1997-98 due partly to the Asian crisis.

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[11] Gulati and Pursell (1995) note that the net export subsidies during these periods were not more than 8% of the f.o.b. value of manufactured exports. Bureaucratic red tape appears to have discouraged exporters to obtain these incentives.

[12] Joshi and Little (1994) find higher export growth during 1970s and from the mid 1980s when the real devaluation of rupee was maintained and slow down in export growth during the real appreciation of rupee (for example, in the early 1960s and the early 1980s).

Indian exports are dominated by manufactured goods which account for about 76% share by 1997-98- increased from 50% in 1970-71 (table3). Four major items (namely gems and jewellery, readymade garments, engineering goods, and chemicals and allied products) dominate its manufactured exports. With the exception of jewellery, all industries have received foreign participation. Engineering goods, and chemical and allied products are the recipient of foreign investment since 1970s while readymade garment was open for foreign investment only in the late 1980s. Table 3 presents structure of exports and export intensity in India.

Table 3: Structure of Exports (% share in total exports unless otherwise stated) and Export Intensity in India

	1960-1	1970-1	1980-1	1990-1	1995-6	1996-7	1997-8
Agriculture and allied products	44.2	31.7	30.6	18.5	19.1	20.5	18.9
Iron ore	2.6	7.6	4.5	3.2	1.6	1.44	1.36
Petroleum products	0.6	0.3	0.1	2.9	1.4	1.44	1.01
Manufactured goods	45.3	50.3	55.8	71.6	73.9	73.5	75.8
Gems and jewellery	0.1	2.8	9.6	16.1	16.6	14.2	15.3
Readymade garments	0.1	1.9	8.4	12.3	11.6	11.2	11.1
Engineering goods	2.0	12.0	13.0	12.4	13.8	14.8	15.2
Chemical and allied Products	1.1	2.3	3.5	7.2	7.4	8.0	9.0
Leather and leather Manufactures	3.9	4.7	5.0	7.9	5.5	4.8	4.7
Jute manufactures	21.0	12.3	4.9	0.9	0.6	0.46	0.5
Other manufactures	17.0	14.2	11.3	0.7	0.4	1.2	1
Other exports	7.2	10.0	8.9	3.9	3.9	3.09	2.9
Total exports	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Merchandise exports % of GDP	-	3.5	4.4	6.0	9.5	9.3	8.4
Manufactured exports % of GDP	-	1.8	2.6	4.2	6.9	6.7	Na
Non-manufactured exports % of GDP	-	1.7	1.8	1.8	2.6	2.6	Na

Source: *Monthly Statistics of Foreign Trade of India* (various issues), Directorate General of Commercial Intelligence and Statistics, and *World Development Indicators*, World Bank 1999.

IV.   Models of Export Demand and Supply Functions

Since export performance is influenced by both foreign demand and domestic supply factors we develop a simultaneous equation model to explain India's export performance. On the basis of conventional trade theory one would expect that the lower the relative price of India's exports in relation to world export prices the higher the demand for its exports. Hence, a negative link between the relative price of exports and export demand is expected. World income appears to have a positive impact on export demand and the appreciation of the real effective exchange rate (REER) reduces export demand (Joshi and Little, 1994 and Srinivasan, 1998).

On the basis of theoretical reasoning one would expect a rise in export supply when the export prices rise relative to domestic prices and vice versa. Increase in domestic demand diverts export supply towards domestic consumption, leading to a fall in exports. This lead us to believe that there is a negative link between domestic demand and export supply (Joshi and Little, 1994). The role of FDI in export promotion in developing countries is ambiguous and crucially depends on the motive behind such investment. If the motive behind such investment is to by pass trade barriers in the host country, then it is highly unlikely that such investment would result in better export performance. However, if FDI is motivated by the country's comparative advantage, then it may contribute to export growth. Thus, the nature of the link between FDI and export performance is not clear cut. Reliable and efficient infrastructure facilities are essential for reducing costs, ensuring timely supply of exports and thereby improving export

performance (Srinivasan, 1998). However, many developing countries including India lack reliable and efficient infrastructure facilities due mainly to under-investment and the public sector intervention. This contributes to higher costs and poor export performance. Thus, we expect a positive link between improved infrastructure facilities and export supply. The above discussions lead to the following specifications of export demand and supply functions, with expected signs given in prentices.

$$XD= f \text{ (ER, PX/PW, WY, LXD)-----------------(eq. 1)}$$
$$\phantom{XD= f \text{ (}}(-) \quad (-) \quad\quad (+)$$

$$XS= g \text{ (PX/P, DD, FDI, INF, LXS, t)------------(eq. 2)}$$
$$\phantom{XS= g \text{ (}}(+) \quad (-) \quad (?) \quad (+)$$

where:
XD= Export demand, measured as total export volume index.

ER= The real effective exchange rate (REER).

PX/PW= Relative price of exports, defined as the ratio of unit price of Indian exports in

US$ (PX) to the unit price of world exports in US$ (PW). Export subsidies are

also included in PX.

WY= World income, proxied by the world GDP in US$.

LXD= Log of lagged export demand.

XS= Export supply, measured as total export volume index.

PX/P= Indian export prices relative to domestic prices, where PX is the same as export

demand equation while P is the wholesale price index for India.

DD= Domestic demand pressure, proxied by the gross fiscal deficit of the Central

Government as a percentage of GDP.

FDI= Foreign direction investment, measured as the net inflows of FDI in US$.

INF= Infrastructure facilities, measured as infrastructure investment percentage of GDP.

LXS= Log of lagged export supply.

t= Time trend which captures trend movements.

V   Econometric Results

Models specified above are estimated using annual data for 1970-98 periods. Results are reported in tables 4 and 5. Since Hausman's specification test indicates simultaneity bias the two-stage least squares (2SLS) procedure is applied. In an attempt to improve the individual significance of variables, variables with statistically insignificant t-ratios were deleted one by one, this process did not significantly alter the results.[13] Estimates for both the full and reduced models are reported.

Table 4: Results for export demand equation

Independent variable	Full model	Reduced model
Constant	8.922 (1.197)	3.176 (3.373)***
Log of REER	-0.346 -(2.310)**	-0.289 -(2.229)**
Log of relative price	-1.164 (-2.230)**	-1.005 (-2.111)**
Log of world income	-0.179 (-0.777)	
Log of lagged exports	0.888 (11.170)***	0.846 (14.630)***
Serial correlation+	-0.535	-0.156
Adjusted R^2	0.98	0.98
No. of observations	28	28

Significant levels are: ***1%, **5% and *10%
+ Durbin's *h* statistics.

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[13]   Note that in the reduced model of export supply function we retain FDI variable although its coefficient is statistically insignificant in the full model.

The negative elasticity of export demand with respect to REER implies that the real appreciation of the rupee adversely effects Indian exports. This means a 10% appreciation of the rupee reduces export demand by 3.46%. The short-run exchange rate elasticity of export demand is 0.34 which rises to 3.08 in the long-run. Over 50% of the long-run effect comes through within 5 years after the current year. Our finding that the appreciation of the rupee adversely effects India's export performance is similar to the earlier work of Joshi and Little (1994) and Srinivasan (1998). The negative price elasticity of export demand implies that a 10% increase in India's export prices relative to world export prices reduces its export demand by 11.64%. The short-run price elasticity of export demand is 1.16 which rises to 10.39 in the long-run. About 50% of the long-run effect comes after 7 years. We do not find any significant link between India's export performance and world income. This is opposite to Joshi and Little (1994) who observe statistically significant and a positive link between India's export performance and world income. Differences in results appear to be due to variations in period covered. For example, Joshi and Little (1994) study cover 1963-87 periods while our study rely on data for 1970-98. Furthermore, they use three different measures of export demand (ie, India's total export volume, non-oil export volume and non-oil export volume to convertible currency ares), and world income (ie, GDP of India's industrial-country trading partners which is weighted by India's trade with them, world GDP and export volume from non-oil developing countries). However, we rely on only one measure of export demand (ie, total export volume index) and use world GDP as a proxy for world income. Furthermore, our simultaneous equation also include REER variable to see the impact of exchange rates on India's export performance.

Results of the export supply function are reported in table 5.

Table 5: Results for export supply equation

Independent variable	Full model	Reduced model
Constant	1.323 (2.401)**	1.239 (2.300)**
Log of relative price of exports	0.856 (1.901)*	0.948 (2.135)**
Log of domestic demand pressure	-0.292 (-3.039)***	-0.332 (-4.172)***
Foreign direct investment	0.000 (1.673)	0.000 (1.397)
Log of infrastructure investment	0.025 (0.312)	
Interaction between FDI and log of infrastructure investment	-0.000 (-1.399)	
Log of lagged exports	0.439 (3.245)***	0.443 (3.289)***
Time trend	0.055 (3.585)***	0.058 (3.918)***
Serial correlation[+]	-1.831	-1.297
Adjusted R^2	0.99	0.99
No. of observations	28	28

Significant levels are: ***1%, **5% and *10%
+ Durbin's h statistics. FDI is included in linear form.

The positive price elasticity of export supply implies that a rise in export prices in relation to domestic prices increases export supply. The price elasticity of export supply rises from 0.85 in the short-run to just over 1.52 in the long-run. More than 50 percent of the long-run effect comes through within a year after the current year. The negative elasticity of export supply with respect to domestic demand pressure indicates that export supply declines as domestic demand increases. The elasticity of domestic demand pressure increases from 0.29 in the short-run to 0.52 in the long-run. Over 80% of the long run effects appear within a year. Although the coefficient of FDI variable is positive, there is no statistical evidence, at least at 10% level, to claim that foreign investment improves

export performance. This could be due to an inward-oriented policy that India pursued for a long time which may have discouraged export-oriented foreign investment. The coefficients of neither infrastructure investment nor the interaction term between FDI and infrastructure are statistically significant.

Although our findings for export supply function are similar to Little and Joshi (1994) and Srinivasan (1998), we differ from the previous studies by considering the role of infrastructure and foreign investment in export supply response.

VI.   Conclusion

Over the past few decades India's exports have grown much faster than GDP. Several factors appear to have contributed to this phenomenon including FDI. However, as yet there has not been any attempt to investigate the role of FDI in India's export performance. Using annual data for 1970-98 we investigate this issue in a simultaneous equation framework. Results suggest that demand for Indian exports increases when its export prices fall in relation to world prices. Also the real appreciation of the rupee adversely effects India's export demand. Hence, inflation should be kept lower than major trading partners and reliance on flexible exchange rate be increased to ensure that the real appreciation of rupee is maintained. Export supply is positively related to the domestic relative price of exports and a higher domestic demand reduces export supply. This suggest that tight monetary and fiscal policies are necessary especially at the time of high growth to check domestic prices and demand pressure. Foreign investment appears to

have statistically no significant impact on India's export performance although the coefficient of FDI variable has a positive sign. Similarly, we find no evidence to claim that the level of infrastructure has an impact on export supply.

These results, however, must be interpreted with caution. First, our dependent variable (ie, total export volume index) groups together exports of primary, mineral and manufactured products. In doing so we assume that export demand and supply functions are same in all categories which may not be the case. Second, we are unable to model the effects of liberalization due to rather short time series data. For the same reason we are not able to consider the longer lag effects.

Export volume index. *Monthly Statistics of Foreign Trade of India*, Directorate General of Commercial Intelligence and Statistics, and *Economic Survey*, 1992-93 and 1993-94, Government of India (GOI).

Export unit price index for India and the rest of the world. *International Financial Statistics* (CD ROM), International Monetary Fund, 2000.

World income. *World Development Indicators* (CD ROM), World Bank, 1999.

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