CHAPTER SIX

CHAPTER - 6

THE IMPACT OF FOREIGN INVESTMENT ON NATIONAL INCOME, CORPORATE INVESTMENT AND RESEARCH & DEVELOPMENT IN INDIA.

It has been seen earlier that outflow of remittances on account of PFI has adversely affected the Balance of Payment position of India. It however, does not mean that PFI has not contributed to the development of national economy. It can be argued that PFI has contributed to the development of the economy by raising national income, accelerating investment and upgradation of technology in Indian Industries which ultimately has a favourable impact on economic growth of the country. Therefore, it becomes desirable to examine the impact of private foreign investment in relation to these aspects.

I

IMPACT OF PRIVATE FOREIGN INVESTMENT ON NATIONAL INCOME IN INDIA

Private foreign investment can play a crucial role in raising the national income in developing countries like India, thereby enhance the pace of economic development. For, PFI brings with it several complementary factors like superior marketing and managerial skills, technology, and the like which helps in putting the existing resources of the economics to better use. Thus, inflow of PFI is desirable from the stand point of faster economic growth.[1]

Private foreign investment has been flowing to India on varying scales over the years. This being so its contribution cannot be overstated. Nevertheless, it can be argued that growth of national income may be a precondition for attracting more foreign investment.[2] This is substantiated by the fact that developed countries like USA, Japan and NIC like Taiwan, S. Korea have attracted increased flow of PFI from other developed countries, mainly due to their economic growth.[3] However, in a low income country, PFI has to be welcomed considering the need to accelerate their growth rate (NI). Thus, it is necessary to ascertain whether foreign leads to increase in national income or vice versa. To answer this question, the causal test has to be undertaken. The testing of causal relationship between national income and foreign investment becomes important as it has implication for development strategies. Following from the above,

"it is hypothesized that private foreign investment has lead to the raising of national income in India".

1. Data and Methodology

The required data for testing this hypothesis are obtained from various issues of RBI bulletins and Economic Surveys, Government of India. A long period of time between 1960-61 to 1992-93 is chosen, to analyse the relationship between PFI and national income in proper perspective. The casual relationship between the two variable is tested with the help of Granger Test of Casuality.[4] This test has been used in India in other studies also to investigate the casuality between

variables such as exports and industrial growth, exports and economic development.[5] As the impact of foreign investment on NI involves a time lag, the Granger Test helps to examine this aspect also.[6] Further, it also enables us to investigate whether the casual relationship is two ways or one way. The model consists of estimating a set of four equitations :

Y = f (X,2 past Lags and 2 future lags X).....1

Y = f (X,2 past Lags of X).....2

Y = f (Y, 2 past Lags and 2 future lags of Y).....3

Y = f (Y, 2 past Lags of Y).....4

Where,

Y = National income and X = PFI, both the value of Y & X are in Rs. crores and at current price.

Thus, in the Granger Test, two equations with NI as dependent variable having -

(i) two past and future lags of PFI

(ii) two past lags of PFI as independence variables (eq. 1&2) are estimated.

Another set of two equations are run with private foreign investment as dependent variable and NI as independent variables. Further, it is necessary to use 'F' statistics in order to observe the causality between 'X' and 'Y'. 'F' statistics are calculated as follows :

$$F = \frac{(RSS_2 - RSS_1) / df_2 - df_1}{RSf_1 / df_1}$$

Where RSS_1, RSS_2 are the residual sums in equation (1) & equation (2) respectively. df_1 and df_2 are degree of freedom in equation (1) and equation (2) respectively. The same procedure is adopted to estimate F statistics in equation (3) and equation (4) also. If causality runs from PFI to National Income (PFI → NI), than it means inflow of foreign investment will promote the growth of national income. On the other hand, if the causal relation is in the oppposite direction (NI → PFI) then it implies that growth of national income may be a pre-requisite for the country to attract PFI.

2. The Findings

The result of Granger test of causality between PFI and NI in India is shown in Table 6.1.

Table 6.1 : The Results of Granger Test of Causality between Private Foreign Investment and National Income.

Equation No.	Dependent variable	Constant term	Independent variables						F ratio
			Xt	Xt-1	Xt-2	Xt+1	Xt+2	R2	
1.	Y	49539.87	13.47 (2 190)	2 575 (0 346)	6.378 (0.857)	9.614 (1.576)	15.719 (2.885)	0 80	3.2545** (PFI→NI)
2.	Y	59317 64	20.79 (2.897)	12 53 (1 545)	17.77 (2 192)	-	-	0 61	
3.	X	-626.501	0 443 (0.482)	0 0618 (-0 581)	0.1720 (2 037)	-0.140 (-2.0360	0.373 (0.737)	0.56	0.6341* No causality
4	X	-526 16	-0 863 (-1 156)	0 117 (0 110)	0.112 (1 351)	-	-	0 46	

Note : Figures in parenthesis denotes T value,
* denotes significance at 5% level.
** denotes significance at 1% level

In the table it can be seen that equation - 1 & equation-2 gives comparatively a high R^2s. The explanatory power of these equation ranges between 61% and 81% F-ratio of the past values and future values of private foreign investment where national income is treated as dependent variables is 3.2545 which is significant at 1% levels. Thus, it can be said that the effect of PFI on national income in India is positive, i.e., inflow of foreign investment has lead to an expansion in NI.

When, PFI is taken as dependent variable (equation 3 & equation 4), the explanatory power of these ranges between 46% and 56% as per the value of R^2s. However, when PFI is regressed on NI, the two equations gives, a F-ratio of 0.6341 which is insignificant both at 1% and 5% level. This means increase in NI will not have much of a effect on the inflow PFI in India. These two equations i.e., 3&4 leads us to conclude that growth of NI is not a significant factor influencing PFI in Indian economy for the period considered. Others factors may have influenced the influenced the inflow of PFI into the country.

3. The Factors Affecting Private Foreign Investment Flows in India

(i) Government policies

As was seen earlier, the host countries policies towards PFI is a significant factor in explaining foreign investment in any country.[8] This is so because, when government policies are favourable only than foreign firms are able to exploit their monopolistic advantages in investing in other countries.

In India, whenever the government has adopted liberalised policies towards foreign investment, the country has witnessed increasing flow of PFI, because it make India an attractive place for the world to park its money. In India three distinct phases are noticeable in the governments attitude towards PFI : the period from 1948 to 1968 was marked by liberalized attitudes, 1968 to 1980 was characterized by a selective and restrictive phase, 1980's onwards once again witnessed a liberal era.[9] The changing attitude of the government and its effect on PFI can be measure in terms of number of foreign colloboration approved which is shown in below table.

Table 6.2 : Summary of Foreign Collaborations Approvals, 1948-1993.

Period	Average No. of collaborations	Average Foreign investment involved per year (Rs. million)
1948.58	50	N.A.
1959-66	297	N.A.
1967-79	242	53.62
1980-90	723	1048.50
1991-93	1315	44280.40

Compiled from GOI, SIA. Newsletter March 1994.

The graduate liberalization of policy in India have resulted in almost five-fold increase in average number of collaboration approved per year from 50 during 1948-52 to 297 during 1959-66. However, the restrictive posture adopted by the government during the period 1968-80 reduced the average number of approves to 242 p.a. Since 1980 as a result of considerable liberalization of policy, the

approvals have increased manifold, for instance, during the post reforms period (1991-93) the average number of foreign collaboration approved by the government was the highest (1315). Thus, from the above it can concluded, that policy of the government may have an important factor in attracting foreign investment to India.[10]

(ii) Political stability and continuity of economic policy

The confidence of foreign investors in the political stability of India has not been shaken, inspite of frequent changes of the government at the centre in recent past. The foreign investment continues to flow into India at a reasonable high rate. From 1980 to 1993. Outstanding value of PFI has increase by 2500 % (vide T.4.1) This increase in PFI was much higher than earlier period which was characterized by one party rule at the centre. Thus it should be apparent that changes in the central government has not undermine the political stability of India. This has been a significant factor in attracting PFI.[11]

Private foreign investment especially in direct form is a long term investment. If frequent changes in central government leads to reverting of the policies introduced by earlier government, than flow of PFI may be adversely affected. Thus, in addition to political stability the continuity in policies towards foreign investment is also important. The process of liberalization which started in mid-eighties has continued till date irrespective of changes in the government. This has made foreign investor to look at India as attractive market for investment.

(iii) Availability of social and physical infrastructures

Foreign investment requires complementary factors like social and physical infrastructure within the economy, to become profitable. Widespread availability of educational, health services, power and transport facilities is therefore, a vital infrastructural requirement to attract PFI. In India, over the years there has been a steady improvement in the supply of infrastructure and social services. Table 6.3 shows some of the principle indicators of the progress in this area :

Table 6.3 : Growth in Activities Covering Infrastructure and Social Services during 1960-61 - 1992-93.

	Activity	Unit	1960-61	1970-71	1980-81	1992-93	% changes between 1960-93
1.	**Education facilities :**						
a)	Schools	Thousands	397	536	663	811	104
b)	Students in schools (enrolment from Class I to Class VI)	Millions	45.1	76.9	105.3	166.8	270
c)	Technical education - Science & technology, enrolment.	Thousand	381	1185	820	1294*	240
2	**Medical facilities :**						
a)	Registered Doctors	Lakhs	0.76	1 39	2.69	3.94*	418
b)	Hopital Beds.	Thousand	200	326	569	811*	306
c)	Expenditure on health	Rs. crores	97 7	349 8	1764	9458	9580
3.	**Physical infrastructures**						
a)	Electricity (installed capacities)	MW	5654	16271	33316	81750	1346
b)	Railways freight carried	Ml tonnes	120	168	196	350	192
c)	Surfaced roads	Thousand km	263	398	683	1001*	281
			1961	1971	1981	1991	
4.	**Population**	Million	361	439	685	846	134

Note : * is for the year 1990-91 only.
Source : Complied from CMIE : Basic statistics relating to Indian Economy, August 1994.

Table 6.4 : Industry wise Foreign Collabrotion Approvals in India (1991-96).

(Rs. crores)

Industry	Value	% of the total
Telecommunication	19488	24.94
Power & oil Refinery	16682	21.35
Transportation	51292	6.56
Electrical equipment	42177	5.40
Metallurgical	4.9927	6.34
Service sector	52079	6.67
Food processing	51216	6.55
Others	49848	22.19
Total	781345	100.0

Source : India Development Report, IGIDR, Bombay, 1997, p. 135.

The T.6.3 reveals that educational system and medical facilities have expanded considerably, infrastructure like power and transport have also developed. The importance of these facilities in attractively PFI into manufacturing industry cannot be overstated. Here it should be noted that foreign investment itself can play an important role in creating infrastructure facilities. This is obvious from the approvals of foreign investment in India. (vide T. 6.4)

(iv) Availability of cheap and trained labour

In addition to the above, India has been attracting PFI on a larger scale due to the availability of cheap and skilled labour. In fact, the MNC's from developed world are relocating their production base in lower wage economics like India, some of the MNC's are even shifting their research bases to developing countries including India. These is due to the reason that high competetion in the source country has

forced the multinationals to cut cost. Thus they would hire a worker in India for Rs. 5000 a month, than pay Rs. 60,000 in the US. Hence, they have shifted their bases to the developing countries.[12] However, it should also mentioned here- that, attracting foreign investments requires not only cheap labour, many sub-saharan countries, for instance, have lower wages than countries like India, yet fail to attract such investment. It also requires other factors like physical and social infrastructure and a stock of local technical and managerial talent.[13] In this regard India is at an advantageous positions (Vide T.6.3)

To sum up, it can be said that Granger test of causality supports the hypothesis that PFI flows has spurred economic growth in India by raising national income. However, the growth of national income is not a significant factor in attracting PFI. Other factors like favourable policies, cheap labour etc. may have contributed in making India an emerging market for investment. Here, the question arises as to how foreign investment has encouraged the growth of national income in India. A possible reason may be its favourable affect on domestic investment, which through multiplier effect may have increased national income. This will require an examination of the effect of PFI on investment in India.

II

THE EFFECT OF PRIVATE FOREIGN INVESTMENT ON CORPORATE INVESTMENT IN INDIA

Traditionally the long-term view of benefits arising out PFI is based on the perception that such flows of capital act as an "Engine of Growth" in the developing

countries. According to this view, PFI is seen as an important source of foreign resources for the host countries which augment their domestic resources available for investments, particularly so, when foreign aid haas been increasingly difficult to obtain. The availability of foreign capital pushes up the domestic rate of investment in low income countries as these countries are known to suffer from low rate of savings.[14] A recent report by UN has reiterated the same point.[15]

In India foreign investment is flowing mainly to corporate sector. Hence it will be appropriate to consider the share of PFI in corporate sector in India as a relevant parmater for examining the relationship between PFI and domestic investment.[16] If the share of PFI in corporate investment is high, than an increasing flow of PFI will lead to a rise in level of corporate investment,

"it is therefore hypothesised that PFI has contributed to the rise in corporate investment in India".

1. Data and Methodology

The necessary data for testing the hypothesis are obtained from RBI publication, for the period between 1961 to 1993. The relationship between PFI and corporate investment (CI) analysed through the Log.Log regression technique.The logic of using this techniques is that it not only permits one to relate CI with foreign investment, but also with its other components - Household Savings (HS) in the form of shares and debentures and Domestic Corporate Investment (DCS). Thus, in all the following three equations are estimated.

$$\text{Log } CI_t = a+b \text{ Log } DCS_t \quad \text{.....(1)}$$

$$\text{Log } CI_t = a+b \text{ Log } HS_t \quad \text{.....(2)}$$

$$\text{Log } CI_t = a+b \text{ Log } PFT_t \quad \text{.....(3)}$$

where co-efficient 'b' in all the equations denote the elasticity of DCS, HS or PFI with respect to CI.

2. The Findings

The results of regression analysis are presented in Table 6.5. In equation -1, corporate investment has been regressed on domestic corporate savings (DCS). The estimated co-efficient of DCS as expected is positive. However, as per the value of R^2 (28%) the degree of correlation is statistically insignificant at 1% level. If equations 2 and equation -3 are considered, than it is indicated that although the elasticity of HS and PFI with respect to CI is less than one, T values and R^2 is quite significant, indicating that there is a high correlation between PFI flows and investment in corporate sector (Eq. 3).

Table 6.5 : Results of Regression Equation on Corporate Investment (1961-93).

Equation No.	Constant term	Independent variable	Coefficient	R^2
1	1.780	DCS	0.449 (3.230)	0.28*
2	1.832	HS	0.514 (6.957)	0.64*
3	2.016	PFI	0.382 (5.284)	0.58*

Note : (a) Values in parenthesis are 'T' values.
(b) * denotes significant at 1% level.

If an identical exercise is carried out for different sub-periods, than the results of regression test is as presented in table 6.6.

Table 6.6 : The Results of Regression of Private Foreign Investment on Corporate Investment.

Period	Equation No.	Constant term	Coefficient of independent variable (PFI)	R^2
1961-70	4	1.773	0.321	0.663*
1971-80	5	2.555	0.634 (0.903)	0.093*
1981-93	6	1.886	0.540 (6.396)	0.836*
1986-93	7	-0.814	1.290 (5.516)	0.938

Note : (a) Figures in parenthesis are 'T' values.
(b) * devotes significant at 1% level.

For the two sub-period 1961-70 and 1981-93, it is found that PFI has contributed positively in raising the level of corporate investment, as the 'T' values and R^2s are quite significant. But, for the sub-period 1971-80, the relationship between PFI and CI is weak and satistically insignificant as per the value of R^2 & 'T' values. If the period 1981-93 is further divided into period 1986-93, than it found that not only the degree of responsiveness of investment in corporate sector to PFI is very high but that 'T' value and R^2 are highly significant.

By way of conclusion it can be stated that results obtained indicate on the whole PFI promotes corporate investment in India. With privatisation and liberalisation process initiated by Indian Government, the corporate sector is likely to determine

the overall investment in Indian economy,if so, these results can be considered as comparable to findings in a study which found that in countries like Indonesia, Malayasia, Thailand, PFI flows and aggregate investment have a positive and significant correlation. [17]

Although, foreign investment corporate investment are general positively correlated, the importance of PFI in the domestic corporate sector varies from time to time as shown in below table :

Table 6.7 : The Share of Private Foreign Investment, Domestic Corporate Sector (DCS) and Household Sector (HS) in corporate Sector Investment (%).

Period	DCS	HS	PFI
1961-70	41	17	42
1971-80	72	16	12
1981-93	25	22	53
1961-93	30	22	48

Compiled from A-24.

Two reasons can be cited for the variation in the share of private foreign investment in corporate investment.

(i) Changes in Business Opportunities

Private foreign investment are undertaken primarily to take an advantages of business opportunities. This being so, the pace of PFI flows to corporate sector have generally coincided with the industrial growth rate. For instance during 1961-

70 when the compound average annual growth rate of industrial output was 5.6% the share of PFI in CI was relatively high. On the other hand when the industrial growth was low (4.7% p.a.) during 1970-81, the PFI flows to corporate sector slackened. Similarly during 1981-91 when the industrial growth rate was 7.1 % p.a., which was the highest for any decade, PFI flows was the largest.[18]

(ii) Policy Changes

The government's attitude toward PFI during 1st sub-period was relatively liberal, followed by restrictive and selective policy during the 2nd period. The government's attitude became more positive under the impact of economic reforms, during the 3rd sub-period consequent upon these changes a very high correlation between PFI and corporate investment is obtained during the liberal phase in the governments' attitude towards PFI.[19]

III

THE IMPORT OF TECHNOLOGY AND ITS EFFECT ON LOCAL RESEARCH AND DEVELOPMENT IN INDIA

Technology has been looked upon as the most visible element in the process of economic growth and modernisation.[20] The reason being that technical progress by increasing the production capacity of a country helps to improve its economic performance. Thus, technological progress is at the core of development process. This point was not only emphasised by the classical economist but also being reasserted by modern economist.[21]

The recognisation of technology as a dynamic factor in economic growth evoked enthusiasism among developing countries including India since 1950's to follow a strategy that entailed the use of improved and indeginous technologies through local, research and development (R&D).[22] Typically, enterprise in developing countries first import technology and then undertake R&D to adapt the technology to suit the local conditions.[23] It is preferred to import technology because it is already in use in the source country. It would involve lot of time and cost to develop the same technology in the importing country. However, the imported technology may not be appropriate with respect to domestic consumer's caste, their consumption habits, climatic conditions, availability of factors of production, the factor prices, market size etc.

R&D efforts may become essential to adapt the imported technology to suit the local conditions. This kind of strategy to import technology and then adapt it to local situations may be called "Import and Adapt Technology" (IAT) strategy. According to a survey by NCAER, the R&D objectives of 90% of Indian firms were limited to the absorption and adaption of imported technology. This is done so that its capacity to adapt the imported technologies to local conditions is raised.[24]

In India several studies have been carried out to examine the relationship between import of technology (IT) and R&D in Indian industries. According to some of these studies IT has stimulated 'in-house' R&D.[25] While a few studies have pointed out that the stimulus provided by IT to research and development in India is quite low.[26] Here it should be mentioned that Local R&D and imported technology are

positively correlated because it is import and adapt technology strategy that is followed in India, rather than innovative R&D[27] Inspite of IAT strategy, still it is found that degree of relationship between imported technology and research and development varies from studies to studies. This may be so, due to various forms of technology imports taken into considered, by various studies.[28]

"It is, therefore hypothesized here that imported technology and research and development are positively related, and intensity of this relationship is dependent on the forms of technological imports".

1. Data and Methodology

For testing the relationship between R&D and imported technology in India, the industry level data published by RBI had been considered. These data not only permit one to relate the expenditure on IT through payments of royalties and technical fees with R&D expenditure but it enables the relationship to the analysed over a period of time (1980-93).[29] However the limitation of these data is that the industry level totals may include enterprises that donot under take R&D. There may also be a problem of "Transfer pricing" due to which amounts charged for importing technology through foreign direct investment may differ from the price paid for comparable technology imported through licensing arrangements.[30] However, the Indian Government monitors and regulate payments of royalties and technical fees therefore the problem may not be a serious one.[31]

The methodology adopted for analysing the relationship between IT and R&D is as follows :

(i) Let Rd and IT denote expenditure on research and development and on technology imports, respectively. The subscript 't' "denote the time period.

Thus,

Rdt = f(IT)t, which is stated in the following form.

Log Rdt = a+b ITt .....(1)

In the above equation the co-efficient 'b' is the elasticity of IT with respect to R&D. The sign as well as magnitude of 'b' can be interpreted as an indicator of direction and degree of dependence of local R&D on imported technology. A positive sign and a value greater than unity will indicate high degree of dependence of domestic research and development on IT. Conversely if the sign is negative and the value is less than unitary, it can be stated that external dependence is low.[32]

(ii) It may be argued that expenditure on R&D in a given year "t' depends on the future expenditure on technology imports because there may be a time lag of atleast one year between imports of technology and resulting payments for the same. In which case the above equation - 1, becomes :

$Rd_t = f(IT_{t+1})$

or in double log regression

$\text{Log } Rd_t = a + b \text{ Log } IT_{t+1}$ .....(2)

As mentioned earlier, the impact of technological import on R&D depends on forms of technology imports. It is therefore, necessary to estimate the regression for foreign firms and Indian firms separately.[33] In other words in all the following four equations are to be estimated.

$\text{Log } Rd_t = a+b \text{ Log } IT_t$ of IF .....(3)

$\text{Log } Rd_t = a1 +b1 \text{ Log } IT_t$ of IF .....(4)

Where IF refers to Indian firms having only technical collaborations.

$\text{Log } Rd_t = a2+b2 \text{ Log } IT_t$ of F.F .....(5)

$\text{Log } Rd_t = a3+b3 \text{ Log } IT_t$ of F.F .....(6)

Where, F.F denotes foreign firms, i.e., firms in India having both financial as well as technical collaborations.

2. The Findings

The result of regression analysis to test the hypothesis is presented in table-6.8.

Table 6.8 : The Result of Regression of Technological Import on Research and Development in India.

Sr. No.	Equation No.	Constant Terms	Coefficient & independent variable (IT)	R^2
1.	3	-1.475	1.159 (9.279)**	0.895
2.	4	-0.761	0.984 (6.610)**	0.829
3.	5	0.256	0.700 (6.702)	0.789
4.	6	0.247	0.669 (6.196)**	0.777

Note : Figures in the parenthesis are 'T' values.
** denotes significant at 5% level.

In all the above four equations the sign of "b" co-efficient, which measures the elasticity of R&D with respect of imported technology is positive whether technology is imported through FDI or through licensing arrangements. Even when a time lag of one year is introduced the conclusion does not alter. This positive relationship can be interpreted to mean complementarity between the two.[34] In other words, local R&D is not treated as a substitute for imported technology, and R&D undertaken in Indian industries is not of innovative type.

If the magnitude of elasticity co-efficient is considered, than the regression results above, clearly show that marginal propensity to invest in R&D relative to technology imports of Indian Firms is different from that of foreign firms. In the case of the former the elasticity of co-efficient shows a value ranging from almost unity (equation-2) and greater than unity (equation-1), whereas for foreign firms it is less than unity. This is an indication of greater pursuit of self-reliance by India firms in form larger investment on R&D efforts.

Various explanation can be provided for the foreign firms lower propensity to invest in domestic R&D for local adaptation with respect to technology import. First, they may not be interested in domestic innovation as they can always depend upon their parent company for technology for output expansion or diversification. Second, the main interest of parent companies lies in draining out maximum outflows in form of royalties and technical fees payments and less interested in local adaptation. On the other hand, there are reasons for expecting a greater propensity to undertake in house R&D among Indian firms because of lack of

access to resource laboratories of the technology supplier, and anxiety to absorb the technology before expiry of the licensing agreements as there may be restrictions placed on renewals of the technical collaborations by the government.

The Regression results can be interpreted to imply that the relationship between research and development and IT is that complementarity rather than substitubility. However, foreign firms which acquire technology from their parent companies do not back-up the imports with local R&D efforts in the same intensity as firms under Indian ownership.

Thus, it can be inferred that the effect of technology import on local technological capability to be dependent to quite a extent on the mode of imports. It is noted that foreign firms were less concerned about adaptation and absorption.[35] It stands to reason that a policy of liberalisation and outward orientation as the one currently pursued in India may raise technology level but, paradoxically, the degree of technological dependence would increase. Hence, from the view point of promoting indegenious technological capability through faster absorption and innovations, the official policy ought to restrict technology imports through direct investment and encourage through licensing whenever a choice is available.

IV

CONCLUSION

Notwithstanding, the adverse impact of foreign investment on India's balance of payments, it is found that foreign investment has had a positive effect on India's

national income. The Granger test of causality establishes that PFI has led to growth.of national income in India. However, the growth of national income is not a significant factor for attracting foreign investment. Other factors such as government policies, assured domestic market, cheap labour and availability of social and infrastructural facilities in India have attracted foreign investment to India. Subsequently, it is found through regression technique that PFI has contributed positively in enhancing the investment capacity of the corporate sector in India.

One of the important objective of inviting foreign investment to India is technological upgradation of domestic industries. This is to be achieved by importing technology so that it stimulate domestic research and development. The regression technique used reveals that the relationship between imported technology and R&D in India is positive. However, Indian firms as compared to foreign firm, spend larger sum on research and development in relation to imported technology. This means that licensing is a better channel of technology import than foreign direct investment so long as both the two modes of technology imports are available.

To conclude, the contribution of private foreign investment as observed in terms of national income, corporate investment and domestic research and development is positive. If certain policy changes are made, there is no reason why its cost in terms of balance of payment could be minimized and the role of foreign investment in India's economic development accelerated.

Notes and References

1. The way through which PFI stimulates economic growth has been explained in detail in chapter-3.

2. Schneider F. et al. : "Economic and Political Determinants of FDI", World Development Report, 13, February 1985, pp. 163-166.

3. According to UN : World Investment Report, 1992, in East & South East Asia Countries the average growth rate of FDI inflows between 1986-90 was 36% p.a., and the economic growth rate was 7% p.a., while in African Countries the FDI growth rate was 7.4% p.a. and the economic growth was 2.5% p.a. during the same period. The 1997 report Quoted in TOI, 20-9-97 found that of $ 337 FDI inflows worldwide the developed countries accounted for $ 208.61 of the inflows.

4. Granger C.W.J. : Investing causal relations by econometric models and cross spectral methods, Econometrica, Vol. 37, NO.1, 1969, pp. 424-438.

5. C.f. (a) Kantawala B.S. : On the causality Between Exports of Manufactured Goods and Industrial Growth, Finance India, Vol. No.1, March 1992. (b) Shah M.N. : Causality Between Export Growth and Industrial Development, International Journal of Development Planning Literature, Vol.4, No.4, 1989.

6. The lag relationship between PF & NI has also been stressed in a study by Indrakant S : "Impact of PFI in India and China - An empirical Analysis", in Satyanarayan B. (ed.) : A comparative study of FDI in China and India, Himalaya Publishing House, Bombay, 1996, pp. 132-135.

7. See Roy A : "Foreign Capital in Asia, Trends, Problems and Prospects", EPW, 22nd Oct. 1994, p. 2830.

8. See Chapter 3.

9. Similar identification of these three phases in government's policy towards foreign investment has also by Subrahmanian. See Subrahmanian K.K. : "Technology Imports - Regulations Reduces Cost", EPW, No.32, 9 August 1986, p. 1412.

10. The same approach to show the effect of policy changes on PFI flows has been attempted by Kumar. N. in MNE's and Industrial Organisation - The case of India, Sage Publications, New Delhi, 1994 pp. 42-47.

11. Malhotra R.N : "FDI in India", RBI Bulletin, April 1990, p. 258.

12. Kaushal N : "FDI Reduces Inequality between Nations", Economic Times, 26-3-96, p. 8.

13. Lal S : "Employment, Foreign Investment and Developing Countries", International Labour Review, Vol 134, No.4-5, 1995, p. 529.

14. The model that provides the basis for this conclusion has a three-phase structure. In phase-I external resource help in augmenting domestic investible surplus. In phase-2, the requirement of capital inflows would decline as incremental saving rate exceed investment rate, but the system would however encounter another limit to growth prospects due to trade imbalances and this would step up the capital inflows. In phase-3, to reduce the dependence on external assistance, the model laid out requires that growth must exceed that of imports. c.f : Chenery H. et al. : "Foreign Assistance and Economic Development", American Economic Review, Vol. 56, No.4, Sept, 1966, pp. 685-695.

15. (a) UN : "TNC's as Engines of growth", World Investment Report, New York, 1992, pp. 40-55. (b) A rise in investment rates due to PFI may lead in increase in national income resulting in rise in savings rate, therefore, PFI and domestic saving rates should be positively related. A study by Rana P. on 14 Asian Developing Countries, Lends support to this argument. c.f. Rana P : "Foreign Capital, Exports, Savings and Growth in Asian Region" Savings and Development, 11 (1), 1987, pp. 20-21.

16. The same methodology has been followed by Subrahmanian to examine the effect on PFI on investment in India. See Subrahmanian K K : Import of Capital and Technology, Peoples Publishing House, Bombay, 1972, pp. 30-35.

17. Dhar B et al : "FDI and Domestic Savings - Investment Behaviour, Developing Countries Experience", EPW, Sp. NO. Sept. 1996, pp. 2550-2551.

18. CMIE : Basic Statistics Relating to the Indian Economy, Bombay, August 1994, Table-8.1.

19. Nagesh K : Op. cit. pp. 42-47.

20. Quoted in Mahapatra S : "Focus on the Future", Times of India, 3-12-96, p. 6.

21. C.f: (a) Rosenberg N.U. : "Inside the Black Box-Technology and Economies, Cambridge University Press New York, 1982, p.30. (b) Fransman M : "Conceptualising Technical Change in the Third World Countries - An Interpretative Survey", Journal of Development Studies, July 1985, p. 43.

22. Subrahmanian K.K. & Pillai M. : "Rhetoric and Reality of Technology Transfer", Social Scientist, Vol.5, No.612, 1977, p. 12.

23. Katrak H. : Imported Technology, Enterprise size and R&D in industrialized count- The Indian Experience, Oxford Bulletin of Eco. and Statistiics, Vol. 47(3), 1985, p. 213.

24. NCAER : "Economic and Technological Impact of Foreign Collaboration on Indian Industry", Margin, Vol.26, No.2, Jan-March, 1994, pp. 652-653.

25. See : (a) Katrak H : Op. Cit. (b) Lall S : "Determinants of R&D in a Less Developing Country - The Indian Engineering Industry", Economic Letters, Vol.13, No.4, 1983. (c) Kumar N : "Technology Imports and Local R&D in Indian Manufacturing", The Developing Economics, Vol.25 (3), 1987.

26. C.f : (a) Gumaste V.C : "Anotomy of Inhouse R&D - A case of Indian Automoblie Industry", EPW, Vol. 28, June 1988. (b) Sastry D.V.S. : "Expenditure on R&D and Imports of Technology", RBI Occasional Papers, Vol. 2(4), 1990.

27. Innovative R&D are mainly under taken by Public Sector Industries in India. This is so because their main objective of carring out R&D is to replace Imported technology by indigenous technology. Thus, the relationship IT and R&D in Indian Public Sector industries is negative. See : Siddharthan N.S. : "In-House R&D, Imported Technology and Firm Size-Lessons from Indian Experience", The Developing Economies, Vol. 26 (3) Sept. 1988, p. 219.

28. In India technology is imported mainly in three forms : Through subsidiaries and Branches of foreign companies, through Joint Ventures with minority foreign capital participation and knowhow contracts and through Direct Knowhow Licensing Contracts with payment in cash or kind. See : Beri G.C : R&D in Indian Industry, Concept Publishing Company, New Delhi, 1993, p.86.

29. The relevant data are collected from various issues of RBI and RBI's survey on foreign collaborations in Indian Industry.

30. Lall. S. : "Transfer Pricing by Multinational Manufacturing Firms", Bulletin, August 1976, p. 60.

31. Katrak. N. Op. cit. p. 222.

32. The advantage of Log. Log regression over simple regression is that itt helps in examining not only magnitude of the relationship between R&D and IT, but it also indicates direction and extent of dependence of local R&D on imported technology.

33. Foreign firms which are commonly known as foreign controlled rupee companies in India are those firms which are subsidaries of foreign companies in which 40 p.c. or more of the equity capital is held outside India in any one country and companies in which 25 p.c. or more of the equity capital is held by a foreign company. See RBI Bullettin, Nov. 1994, p. 1395. Indian firms are those which have a equity capital of more than Rs. One Crore and which have technical collaboration only.

34. Similar results are obtained even if cross section company level data are considered. c.f. Bansal S.N. : Deferminant of R&D Expenditure in Indian firms, Kshiiteej, Bombay 1996, pp. 49-53.

35. This is in confirmity with studies which found that foreign firms in India spent significant by less on R&D than Indian firms, C.f. Kumar N., op. cit pp. 228 and Nayyar B.K : India's Quest for Technological Independence, Lancers Publisher, New Delhi, 1983, p. 380.