Import and Domestic Production of Capital Goods
From Substitution to Complementarity

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1. Introduction

Structural Adjustment is aimed at altering the incentive framework for private enterprise so as to bring it to the centre stage of domestic economic activity. The prime mover for investment *and growth then becomes the private sector in general, and private corporate sector [PCS] in* particular. Investment is driven by the expectation of profitability. One of the important factors *making for a rise in profitability is the introduction of new technology, products, or processes.* New technology is imported from the developed countries and is often embodied in capital goods. Thus, investment activity, especially in the private corporate sector, goes hand in hand with the import of capital goods. But in India, which is largely self sufficient in the production of capital goods (Chakravarty, 1987), imports would lead to a substitution of domestic production affecting the capital goods sector adversely. This has been the accepted wisdom in the Indian literature till recently.

Gross capital formation in India showed a sharp fall after the crisis of 1991. This has, however, been a short episode. The recovery has begun by the end of Fiscal 1993-94 and gained momentum in 1994-95 and persisted through 1995-96. This has come along with a sharp upsurge in the import of capital goods. The questions of interest in this context, which this paper addresses are: has the capital formation in the private corporate sector risen along with the import of capital goods? Has the domestic capital goods sector been affected adversely owing to imports? Significant increases in domestic capital formation have often been accompanied by increases in capital formation in the Household Sector (HHS). As capital formation in the HHS is arrived at as a residual, can the recent increase in capital formation be dismissed as a statistical artefact of counting the import of consumer durables as capital formation?

The rest of the paper is organized in four sections. Section 2 analyses the relationship between private corporate sector investment and import of capital goods. Section 3 draws attention to

the accepted wisdom on substitution, and carries out a detailed analysis of the data on the import and domestic production of capital goods. Section 4 answers the question: Is the recent increase in capital formation a statistical artifact.

2. Private Corporate Sector Investment and Import of Capital Goods

On the determinants of private investment in the context of macroeconomic adjustment the survey by Serven and Solimano [1992] is comprehensive. The economic determinants of private investment may be grouped under two heads: domestic and external. The `domestic' determinants include the level of capacity utilization, real interest rate, public investment and macroeconomic stability and under the external is the level of indebtedness, debt service and exchange rate. Recent empirical work has identified three major determinants of private investment, namely, output fluctuations, public investment and debt overhang (Blejer and Khan, 1984; Faini and De Melo, 1990; Greene and Villaneua, 1991; Serven and Solimano, 1993). One important strand bypassed by Serven and Solimano in their survey is the recent econometric analysis by Lindbeck (1983), Weiskopf (1985), Bruno (1986), Glyn (1990); Marglin and Bhaduri (1990) which has brought out the importance of profitability in explaining investment trends in the developed countries.

One of the main methodological problems is that it seeks to explain the determinants of private investment as a whole, consisting of household production for subsistence, primary export production, unincorporated business to organised manufacturing. The disparate elements of the spectrum respond to very different stimuli; investment in primary export production to the price situation, organised manufacturing to public investment, overall demand growth and the ability to import capital goods. These have not attracted the attention of researchers trying to measure the impact of liberalization. The only recent work which has taken the price situation into account is by Bleaney and Greenaway (1993), who take terms of trade as one of the explanatory variables and find its high level of significance in the cross sectional regression.

As regards organised manufacturing, during the last three decades or so, enterprises in the developing countries have turned increasingly to importing technologies from the advanced economies. These technologies have enabled the enterprises to introduce new products and processes, and thereby to increase their profits, sales or market shares. Referring to the marginalisation of Latin America in this regard in the recent past, de Janvry and Sadoulet (1993) say,

> "... Given the state of disarray of the educational and research institutions, competitive integration in the world economy and access to the technological advances in electronics

> and biotechnology will require close cooperation with international capital, the United States and Japan most particularly. The maquiladora system in Mexico, which epitomises this integration, is dominated by electronics and electrical equipment, clothes and textiles, and automobiles, in all of which advanced technology is fundamental for success..." (p. 665).

Import of technology may take place enroute either foreign direct investment or otherwise. But such imports cannot often be dissociated from the import of capital goods. For a country like India, which is almost self sufficient in the production of capital goods, the policy to import capital goods may give rise to mutually offsetting forces:

> ".....While access to new knowledge is a positive factor for future growth, it should be clearly recognised that accompanied by liberalisation of imports of capital goods on a significant scale, domestic costs of production are unlikely to come down if the imports act largely as *substitutes* for domestic production. Inducement to invest may suffer correspondingly unless the prospective demand for final products is large and growing" (Chakravarty, 1987: 66).

The access to new technology will thus, on the one hand, promote investment and on the other, the substitution of imported capital goods reduce the demand for domestic capital goods and hence, dampen investment.

Let us turn now to the investment in gross fixed capital in the private corporate sector in India. The gross fixed capital formation at the economy level in India has shown a steady increase from around 13 per cent of GDP in the late 1950s to around 21 per cent in the late 1980s. This increase has largely been accounted for by the increase in capital formation in the public sector from 5.3 per cent to 10.6 per cent over the period. Capital formation in the private sector increased from 7.6 per cent to 10.7 per cent during the same period. Surprisingly, capital formation in the private corporate sector, by itself, remained at around 1.7 percent of the GDP till the early 1980s.

As is evident from Table 1, the period of early 1960s witnessed the signing of a large number of foreign collaborations and also the import of a larger quantum of machinery and transport equipment. This was followed by a long spell up to the early 1980s when the level of capital formation in the private corporate sector did stagnate. Although the number of foreign collaboration agreements entered into showed an increase from the early 1970s, the quantum index of import of machinery and equipment began increasing only in the early 1980s. It is well known that what had given rise to such phases of foreign collaboration and import of

capital goods was the policy regime pursued then. With the gradual opening up of the economy in the 1980s a greater import of foreign technology and capital equipment has been facilitated.

Table 1: Fixed Capital Formation, Foreign Collaboration and Import of Capital Goods in India (Annual Averages)

Period	GFCF (PCS) as % GDP at current prices	No. of Foreign Collaborations	Quantum Index of Import of Capital Goods
1956-57 to 1960-61	1.76	159	100
1961-62 to 1965-66	2.42	329	140
1966-67 to 1970-71	1.42	166	98
1971-72 to 1975-76	1.76	279	102
1976-76 to 1980-81	1.64	329	111
1981-82 to 1985-86	3.66	686	259
1986-87 to 1990-91	3.54	801	395
1991-92 to 1994-95	6.37	1235*	499*

Note: * initial two years; Index base is 1978-79=100; GFCF= Gross fixed capital formation; PCS = Private corporate sector.
Source: Government of India, **Basic Statistics Relating to the Indian Economy (various Issues)**; Govern ment of India, **Foreign Collaboration: A Compilation (Various issues)**; EPW Research Foundation. 1996. **National Accounts Statistics of India 195-51 to 1994-95.**

We can now take off from the observed importance of profitability in the determination of investment trends in the developed countries (Lindbeck, 1983; Bruno, 1986; Marglin and Bhaduri, 1990), modifying it, however, to incorporate the role of access to foreign technology in influencing investment behavior. The latter is important because it has a very definite role to play in the formation of profit expectations - it enables enterprises to introduce new products and processes, and thereby to increase their profits, sales or market shares - and it is sought to be captured in terms of two variables, namely the number of foreign collaboration agreements entered into (FCNU) and the\quantum index of import of capital goods (IMPM). Together with the often used explanatory variables such as GDP growth rate (GRGDP) and investment in the public sector (PUBI), the equation for investment in the private corporate sector is set out as,

$$PCSI = F (PROF, IMPM, FCNU, GRGDP, PUBI) \quad ... \quad ... \quad ... \quad (1)$$

Three different regressions were run, first without GRGDP, second without PUBI, and third without IMPM. The regression results of Equation (1) are presented in Table 2. All the equations are run in the log form, L denoting the log of the variable. As is evident from the results, when the equation was run with all the variables, except GRGDP (colomn 2), it was found that public investment (PUBI) and number of foreign collaborations (FCNU) were not significant. Dropping PUBI did not bring down R^2 but brought down SER. Only IMPM and

PROF (1) - profitability with a time lag of one - were significant. When IMPM was dropped PUBI, GRGDP, and FCNU were significant.

Table 2: Determinants of Private Corporate Sector Investment

Variables/ Statistics	LPCSI	LPCSI	LPCSI
Constant	-0.441 (-0.42)	-0.402 (-0.45)	0.003 (0.003)
LPUBI	0.289 (0.076)		1.636 (2.131)
LIMPM	0.481 (2.316)	0.492 (3.345)	
GRGDP		0.019 (1.80)	0.032 (2.537)
LPROF(1)	0.732 (2.07)	0.750 (2.874)	0.438 (1.220)
FCNU	0.001 (1.325)	0.001 (1.379)	0.002 (2.537)
R^2	0.765	0.765	0.771
F	15.00	19.54	14.73
SER	0.193	0.189	0.210
DW	1.002	1.84	1.21
Period	1958 to 1986	1958 to 1986	1958 to 1986

Note: t values are within brackets
Source: Same as Table 1; Uma Dutta Roy Chaudhury (1992).

Out of the three regressions, the first and the third cannot be interpreted meaningfully as the value of DW is low indicating serial correlation of residuals. Nomber of foreign collaboration agreements (FCNU) is not significant in the presence of import of capital goods (IMPM). Considering the equation with the lowest SER and DW close to two, it may be inferred that import of capital goods and profitability play a crucial role in the determination of investment in the private corporate sector.

Has the relationship between import of capital goods and fixed capital formation in the private corporate sector persisted through the period of structural reforms/ stabilization? Paucity of comparable data on some of the variables, such as profitability, quantum index of import of capital goods, prevents us from carrying out a rigorous statistical test. However, a careful look at the data (Table 3) suggests the following. Gross capital formation (adjusted for errors and omissions) which was increasing till 1990-91 showed a sharp drop in 1991-92 following the crisis of 1991. The decline continued till 1993-94; recovery was observable in 1994-95. Fixed capital formation in the public sector which had begun declining in 1987-88 continued its downward trend through the reform period. A mild recovery was observable in 1994-95. Fixed capital formation in the household sector has shown sharp fluctuations and the sharp fall witnessed in 1991-92 has not been made good till now. Private corporate sector, however, has

shown a trend of its own. Between 1987-88 and 1989-90, when the import of capital goods was increasing, fixed capital formation did not maintain the momentum gained since the late 1970s (c.f. Table 1). The next four years- the crisis period when imports were in fact restricted- did see a sharp increase in the fixed capital formation in the private corporate sector, the increase being a hefty three percentage points. But when imports of capital goods began to grow in late 1993-94 and later in 1994-95 no significant increase in fixed capital formation could be observed. Thus, the strong relationship that existed between import of capital goods and fixed capital formation in the private corporate sector till the mid-1980s does not seem to persist any longer. Private corporate sector seems to be responding to the changed incentive framework of recent years differently.

3. Capital Goods Import and Domestic Production: Substitution to Complementarity?

Import of capital goods, which is important for capital formation in the private corporate sector, must be adversely affecting the domestic capital goods sector owing to the substitution effect. Has it happened in India?

Table 3. Fixed capital Formation and Import of Capital Goods

Year	Gross Fixed Capital Formation			GCF	Capital Goods Import(%Change)
	PUB	PCS	HHS		
1987-88	10.4	3.1	8.2	22.9	..
1988-89	10.1	3.1	8.5	24.5	..
1989-90	9.6	3.4	9.5	24.9	5304
1990-91	9.4	3.9	9.9	27.0	5832(10.0)
1991-92	9.5	5.7	6.9	23.4	4216(-27.5)
1992-93	8.5	6.0	8.0	23.1	4531(5.4)
1993-94	8.4	6.9	6.2	21.6	6243(37.8)
1994-95	8.7	6.9	7.0	25.2	7382(18.2)

Note: PUB- public sector; PCS-private corporate sector; HHS-household sector.
GCF-gross capital formation adjusted for errors and omissions.
Import is in million US$.
Source: Reserve Bank of India Annual Report (various issues)
EPW Research Foundation(1996) op.cit.

Since the Second Five Year Plan in India, much emphasis was placed on domestic production of capital goods to enhance the future capacity to invest and to reduce import dependence. Accordingly, the domestic infant capital goods industries were provided with protection from foreign competition till the late seventies and imports of capital goods were restricted in a significant way. The capital goods production was on a high growth path from the mid-fifties to the mid-sixties. Bhagavan (1985), analysing capital goods production for the period 1960

to 1978, found that the sectoral production grew at the maximum rate during 1961 to 1965.[1] The rates declined thereafter. The same pattern of growth, from high to low rates, were observed in the major subsectors, but with transport equipment declining at a sharper rate than the machinery subsectors.[2] As a result, by 1977, the capital goods sector consisted of mechanical machinery accounting for 38 percent, electrical machinery for 27 percent and transport equipment for 33 percent of total capital goods production with all the three subsectors keeping pace with each other (Bhagavan, 1985: 417).

It can thus be said that from mid-1950s till the mid-sixties was the period of building up of domestic capital goods capacity. The studies by UNCTAD(1983) and Bhagavan(1985) show that by early 1970's, the industrial economy of India became self-sufficient not only in capital goods production[3], but also with respect to technical and managerial skills and standard modern technology (Bhagavan, 1985: 408). This observation becomes particularly relevant in a regime with restricted capital goods imports. However, none of these studies (UNCTAD, 1983; Ramana, 1984 a and b; Bhagavan, 1985) explicitly highlighted the relationship between capital goods imports and domestic production.

From the early eighties, the external sector was partially liberalised along with domestic decontrol aiming at a more competitive economy. Quantitative controls were done away with and increasing number of capital goods were placed on the open general licence subject to fiscal control such as tariffs, which were kept low for capital goods during the later half of the eighties. These low tariff rates were further lowered during the later phase of external sector liberalisation of the nineties, which involved not only lowering the peak rate of tariff but also significant de-escalation of the average rate for capital goods and intermediates[4]. This resulted in higher quantum of capital goods imports in the eighties (See Table 1 above) and domestic

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[1] The growth path of capital goods production till mid-sixties was achieved through domestic demand creation in terms of investment activity of the public sector (Ramana, 1984a) along with private corporate sector investment complementing the public sector ones. The relative stagnation in capital goods production after the mid-sixties is the combined effect of the declining trends in public and household investment accompanied by falling private corporate sector ones rather than the latter offsetting the former (Ramana, 1984b).

[2] The differential trends within the capital goods sector tended to reflect divergent market conditions for individual sub-sectors (Ramana, 1984a).

[3] The declining import-consumption ratio of the capital goods sector over the period stressed high degree of import substitution achieved in the sector, though such ratios were found to be higher for non-electrical machinery compared to other subsectors (UNCTAD, 1983).

[4] The successive Central Gover nment Budgets during the nineties resorted to lowering of import duties. In 1991-92, the peak rate was reduced to 150 percent, which was further brought down to a peak level of 100 percent in 1992-93 with the substantial lowering of duties on several capital goods and project imports. The peak tariff rate has been further brought down to 85 percent during 1993-94, to 65 percent in 1994/95 and then to 40 perecnt in 1995/96.

production of capital goods growing at low rates during the period[1] This has been termed in the literature (Singh and Ghosh, 1988 and Chandrasekhar, 1987) as substitution of domestic production by imports.

Chandrasekhar (1987) pointed to the adverse effects of higher imports of capital goods on production, highlighting the increase in the share of imports in the net availability of capital goods between 1976/77 and 1983/84. Singh and Ghosh (1988) noting that after 1976-77, there was deceleration in the rate of growth of capital goods production while imports of capital goods increased. They contend, therefore, that 'imports have hit domestic production and led to a shrinking of the market for indigenous capital goods manufacturers.'(Ibid.: 84). Their study, by comparing the annual average growth in production and imports of capital goods, substantiates the relationship of substitution in the capital goods sector. Singh and Ghosh (1988) further predicted that the `increased imports will involve a syndrome of lower rates of (domestic) capacity utilisation and lower levels of production, in which imports, by eating into the domestic market, reduce domestic production, thereby increasing per unit costs and thereby rendering domestic industry less competitive, which therefore leads to more imports' (Ibid.: 86). These studies, thus, endorsed the scepticism raised by Chakravarty (1987).

With the gradual liberalisation imports of capital goods showed a rising trend in the 1980s. The rising imports were adversely affecting the domestic capital goods sector as is brought out by the numerous studies referred to above. The imports of capital goods have tended to rise further in the 1990s, after the reversals of 1991-92 and 1992-93. Has the domestic capital goods sector continued to be affected by substitution?

The syndrome of low growth of domestic capital goods production of the eighties seems to have continued till 1993/94, as can be seen in Table 4. Note, however, that the growth rate was negative at -12.8 in 1991-92 even when the import of capital goods showed a sharp fall. The capital goods industries came out of the negative growth in 1994/95 notwithstanding the rising imports during the year. Moreover in 1994-95, capital goods production grew at 25 percent, which is higher than the rates achieved in consumer goods and other industries[2]. The high growth rate in capital goods production contributed around 50 percent to aggregate

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[1] The growth rate of production of capital goods during the eighties is low when compared to the high annual average rate of 18.95 percent achieved during the first half of the sixties.

[2] Once investment levels recovered in 1994/95, the capital goods sector became buoyant though imports were high (Ahluwalia, 1996: 6).

Table 4 : Growth Rates in Industrial Production: Manufacturing Industries

Industry	Weight	Growth Rate (in percent)			
		1991-92	1992-93	1993-94	1994/95
Aggregate Manufacturing	100.0	-0.8	2.2	6.1	9.0
Basic	39.4	6.2	2.6	9.5	3.8
Capital Goods	16.4	-12.8	-0.1	-4.2	25.0
Intermediate Goods	20.5	-0.7	5.3	11.8	3.9
Consumer Goods	23.6	-1.8	1.9	3.9	8.5
Durables	2.6	-12.5	-0.7	16.1	9.8
Non Durables	21.0	1.2	2.5	1.3	8.2

Source: Economic Survey, 1995-96

Table 5: Growth in Capital Goods Production : Subsectoral Level (in %)

Year	Non- electric Machinery	Electrical Machinery	Transport Equipment
1991/92	-1.9	-12.4	-0.7
1992/93	**-1.2**	2.0	5.0
1993/94	4.4	-4.9	5.3
1994/95	9.7	32.4	13.2

Note : The broad subsectoral classification also includes consumer goods
Source : Economic Survey, 1994-95 and 1995-96

manufacturing growth (RBIAR, 1994-95). The subsectors also followed the same pattern of output growth as can be seen in Table 5, though the revival in non-electrical machinery and transport equiment subsectors began in 1993/94. The electrical machinery subsector grew at the highest rate during 1994/95 and it is in this segment that the imports grew at the maximum. There is, thus, a prima-facie case to argue for complementarity between capital goods imports and production in recent times, as pointed out by Ranagarajan (1995) noted earlier.

However, it is worth examining the issue of complimentarity at the disaggregated level. For this purpose, some specific industries such as computer systems, machine tools, commercial vehicles, electric motors and generators, sugar mill machinery, power transformer, tractors, railway coaches and wagons, power driven pumps, diesel engines, earth moving machinery and ship building are chosen. The data for imports are available from Monthly Statistics of the Foreign Trade of India (MSFTI), Vol. 2, March issues, various years and data on production are available from Economic Survey, 1995-96. The data on imports are in value while the data on production are either in real units or in nominal value. Moreover, the classification on the

two accounts are only broadly comparable. The data on electric motors and generators are clubbed together for imports, but separate for production. Due to non-availability of relevant price indices, growth rates are calculated on nominal values.

Table 6: Growth of Capital Goods Imports (in percent)**

Commodity groups	1992/93	1993/94	1994/95
Computer System	33.12	34.01	38.12
Machine Tools	12.96	0.80	5.39
Commercial vehicles	-62.11	228.73	-26.94
Electric motors & Generators	-8.02	8.72	165.83
Sugar Machinery	-36.99	635.05	806.72
Power Transformer	15.45	47.68	14.74
Complete Tractors	-19.22	-62.44	59.01
Railway Coaches & Wagons	-13.05	-22.01	-48.86
Power Driven Pump	32.29	25.91	38.67
Diesel Engines	37.16	-3.44	96.26
Earth moving equipments	0.30	39.58	-13.66
Ship building	108.99	-10.28	-11.18

Source :MSFTI,Vol. 2, March issues, various years.

At the product group level, the imports of capital goods have grown since 1992/93, but production continued to decline for most of the industries (Tables 6 and 7). The output across industries started reviving from 1994/95 onwards except for railway coaches and wagons, whose output and imports declined through the nineties reflecting lack of demand for these products.

The imports of computer systems, machine tools power transformers, power driven pumps, diesel engines and ship building showed significant growth during 1992-93. Commercial vehicles, electric motors and generators, sugar machinery, complete tractors and railway coaches and wagons and earth moving machinery noted low growth in imports during 1992-93. The import of computer systems were noted to have high growth throughout along with power driven pumps and power transformers. For most of the other industries imports revived either from 1993/94 or 1994/95. However, for railway coaches and wagons and ship building the decline in imports continued till 1994/95.

Table 7 : Growth of Capital Goods Production: Selected Industries (in %)

Industry Groups	1992/93	1993/94	1994/95
Computer Systems (Rs. Crore)	---	-12.50	70.32
Machine Toools (Rs. Mill)	13.25	-14.14	14.24
Commercial vehicles (Th Nos)	-11.08	9.16	34.11
Electric Generators (Rs. Crores)	---	-9.40	28.13
Electric Motors (Mill HP)	-12.69	13.21	11.67
Sugar machinery (Rs. Mill)	-4.37	-21.30	22.00
Power Transformers (Mill KV)	1.52	-0.86	17.68
Complete Tractors (Th Nos)	-11.67	-5.65	13.85
Railway coaches (Th Nos)	-0.79	-23.20	-23.44
Railway Wagons (Nos)	---	-23.00	-24.46
Power Driven Pumps (Th Nos)	-1.51	-9.94	8.92
Diesel Engines (Th Nos)	4.14	-11.91	-0.55
Earth moving Equipment (Th.Nos)	-27.59	-23.81	68.75
Ship Building (Rs. Crore)	---	-22.30	19.45

Source : Economic Survey, 1995-96 and RBIR, 1994-95

Imports of commercial vehicles and earth moving machinery revived in 1993/94 followed by a decline in the following year.

For most industries, the revival in production has started from 1994/95 onwards: these industries are power driven pumps, earth moving equipment, power transformers, ship building, sugar machinery and complete tractors while electric motors and commercial vehicles are on a revival note since 1993/94. The low rates of production growth during 1992/93 for diesel engines turned into negative rates thereafter. Machine tools production showed fluctuating growth rates.

The product groups such as diesel engines, commercial vehicles, earth moving machinery and ship building do not confirm the complementarity hypothesis. The industries like computer systems, power tarnsformers, power driven pumps, electric generators, complete tractors and sugar machinery exhibit simultaneous growth in imports and production from 1994/95 while machine tools and electric motors are found to have complementarity between production and imports from an earlier period. While most of the machinery product groups show high output growth despite growing imports and thus, endorse complementarity in the machinery subsector, the high imports of transport equipments continue to substitute output of the same.

Overall, the recent period does not show the association between import of capital goods and the fixed capital formation in the private corporate sector witnessed over a long period. Similarly, the substitution of imported of capital goods for domestic production witnessed in the 1980s is not to be found for the recent period. Thus, import of capital goods are not leading

to capital formation in the private corporate sector, or substitution of domestic production. Can we, then, dismiss this whole jump in capital formation of the recent past as a statistical artifact arising from the faulty method of estimation of the aggregate capital formation- product flow method which takes account of the total availability, consisting of imports and domestic production, and ascribes the residual as capital formation by the household sector- and the large import of consumer durables recorded as capital goods? Or, are there more substantive processes taking place in the economy in the context of regime change?

4. Rising Capital Formation: A Statistical Artifact ?

The recent rise in the capital formation in the aggregate can be dismissed as a statistical artifact if, (i) the fixed capital formation in the household sector as a proportion of aggregate fixed capital formation has shown a jump; (ii) the share of plant and machinery in the fixed capital formation in the household sector has shown a jump; and (iii) capital formation in plant and machinery in the household sector as a proportion of total plant and machinery has shown a jump. A careful analysis of the data on capital formation in constant 1980-81 prices showed that gross domestic fixed capital formation (in absolute terms and not as a proportion of GDP) which showed a negative growth in 1991-92, picked up from 1992-93 and showed a sharp jump in 1994-95. The increases in capital formation are largely in terms of machinery and plant and equipment- its share in gross fixed capital formation showing a definite upward trend in the recent past, from about 60 percent in 1991-92 to over 66 percent in 1994-95. Such aggregate trend is not to be seen in private corporate sector, or public sector. As already shown, capital formation in the private corporate sector did not suffer in 1991-92, continued to be high in 1992-93 and 1993-94, but slowed down considerably in 1994-95. Capital formation in the public sector suffered in 1991-92 and 1992-93, recovered in 1993-94 and showed some improvement in 1994-95. Household sector alone showed sharp reversals till 1993-94 and recovering sharply thereafter. In terms of assets, in both private corporate sector and public sector the relation between machinery and plant and equipment and construction is maintained. But household sector shows no such relationship and the jump in capital formation of 1994-95 is largely in terms of machinery and equipment (67 percent). The sudden jump in capital formation in the household sector, largely in terms of machinery and equipment, lends credence to the view that this could have occurred due to the import of consumer durables as capital goods. These consumer durables being largely new to India and as there are no competing domestic industries there have been no adverse effects on the domestic capital goods sector.

This way of looking at the problem could, however, be misleading as the sudden jump in capital formation in the household sector in 1994-95 is preceded by sharp declines of the

previous two to three years. A more meaningful way of looking at the problem would be in terms of the share of household sector in gross fixed capital formation, the share of machinery and plant and equipment in fixed capital formation of the sector, and the share of capital formation by the household sector in the form of machinery and plant and equipment in total machinery and plant and equipment. As is evident from Table 8, the share of household sector in gross fixed capital formation showed a sharp decline in 1991-92 and again in 1993-94. Though there is evidence of a mild recovery in 1994-95, the share is still well below the 1991-92 level. The share of machinery and plant and equipment in the fixed capital formation of the sector has also showed a sharp decline in 1991-92, and it has only fluctuated ever since. The share of capital formation in the form of machinery and equipment by the household sector in the total machinery and equipment by all sectors, again showed a sharp decline in 1991-92, and despite the mild increase of 1994-95 has not reached the 1991-92 level. On the whole, there is nothing very unusual in the behaviour of the household sector in 1994-95. In particalur, the data fails to corroborate the view that the large imports of 1994-95 are consumer durables in the guise of capital goods. If this view were true, then the share of machinery and equipment in fixed capital formation in the household sector and the share of capital formation by the household sector in the form of machinery and equipmnet should have shown a sharp increase in 1994-95. There is no evidence of such a jump, and hence the imports could as well be of capital goods flowing into the private corporate sector and the public sector for capital formation.

Table 8. Capital Formation in the Household Sector in the Post-reform Period

Share of (in percentages)	1990-91	1991-92	1992-93	1993-94	1994-95
HHS in Gross FCF	39.68	27.61	28.59	23.57	26.34
Machinery and equipment in FCF of HHS	55.35	35.98	36.95	32.11	39.70
capital formation in machinery and equipment by HHS in total machinery and equipment	35.01	16.32	17.24	11.87	15.93

Source: EPW Research Foundation (1996)

On the whole, the association between import of capital goods and capital formation in the private corporate sector, which was observable till the mid-1980s, is not observable for the recent period. Import of capital goods which adversely affected the domestic capital goods sector through the 1980s is also not observable. An explanation of these two trends in terms of

the import of consumer durables in the guise of capital goods is not tenable for there is nothing unusual in the behaviour of the household sector to substantiate it.

5. Conclusion

Within a regulated policy environment, while private corporate sector was responding to the investment opportunities arising out of import of technology and capital goods, such imports had an adverse impact on the domestic capital goods sector. This scenario has changed as the economy has moved away from the regulatory policy environment into a liberalised policy environment through the eighties. Both public and private corporate sectors have begun responding to a larger incentive framework. Unlike in the past, when a few concessions were offered for the import of technology and capital goods, the change of the eighties has been marked by dereservation and delicensing. Sectors hitherto not open to the private corporate sector have been opened to them. This would imply that expectations of profitability were not confined to the introduction of new products and processes brought from the developed markets but could as well be related to the foray into new sectors not open to them earlier. An indication of this is the fairly high rates of capital formation by the private corporate sector much before the reforms of 1991-92 and the revival of import of capital goods of 1994-95.

One definite component of reforms of the recent eriod is the liberalised exchange rate mechanism which has meant a distinct difference to the incentive framework. Devaluation has meant more expensive imports, despite the reduction in tariffs, and a much more realistic assessment of costs of capital goods. Given the large domestic capital goods sector, responding to the new environment, this has meant picking and choosing capital goods from a spectrum in which the domestic capital goods have a definite place. That is, probably, why a revival of the domestic capital goods sector has been taking place along with the revival of imports of capital goods. These are just some ideas. To clinch the argument calls for a detailed and careful analysis.

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