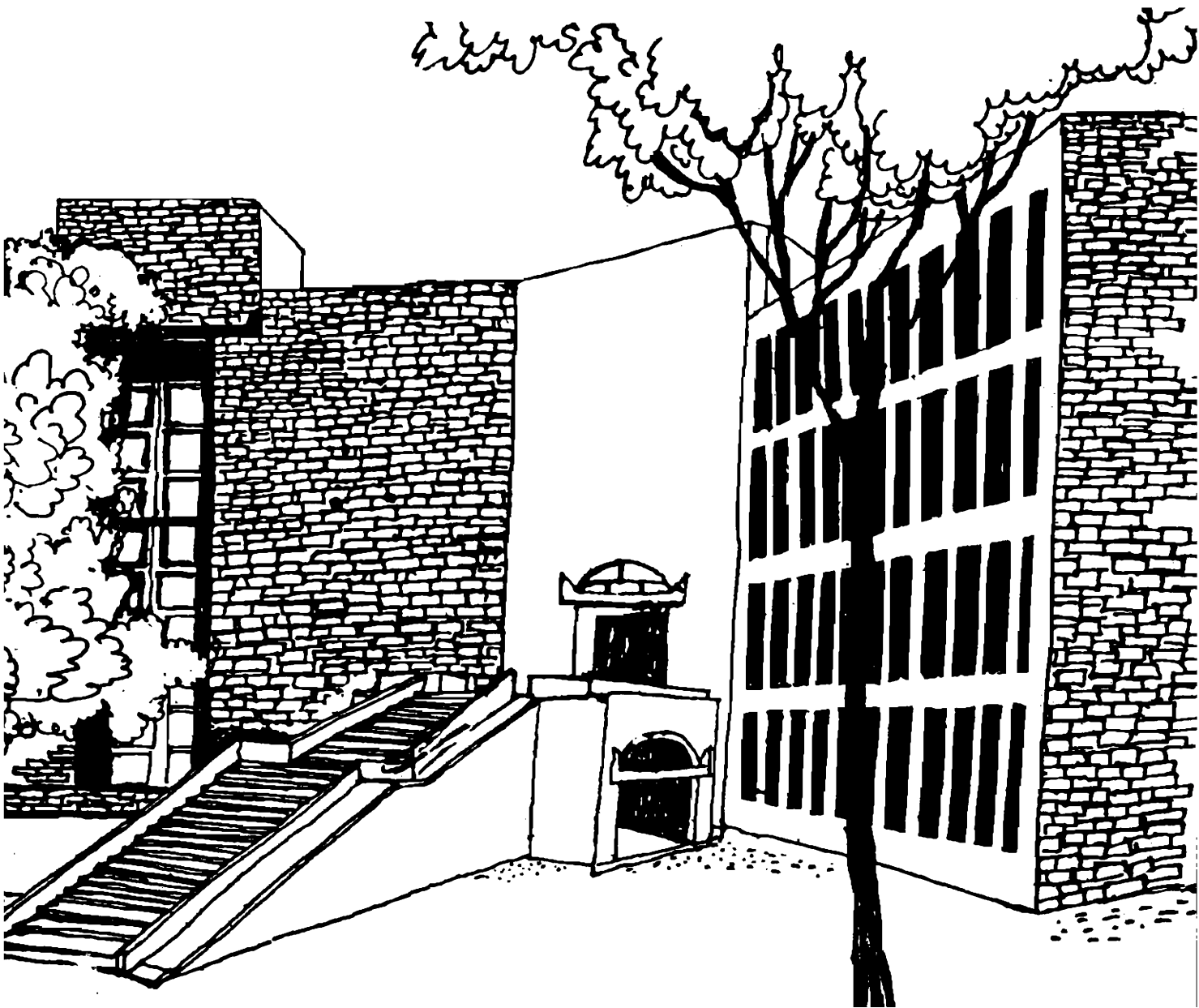




Working Paper



ESTIMATES OF FIXED CAPITAL STOCK IN
REGISTERED MANUFACTURING SECTOR IN INDIA

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Estimates of Fixed Capital stock in Registered Manufacturing Sector in India

While there are minor differences with regard to measuring labour and output in earlier productivity studies, there are significant differences with regard to the measurement of capital. In light of this differences in capital and total factor productivity (TFP) estimates of earlier studies may be largely attributed to the measurement of capital input ^{1/}. Hence it is necessary that measurement of capital should receive top priority in research in this area. Subsequently discussions could be focussed on specific issues in measuring capital stock empirically. The basic objective of this paper is to provide a time series on stock of fixed capital for large manufacturing industries. These estimates can be further improved by making use of better and more disaggregated data from multiple sources. It will provide us an idea about the likely error in the measurement of capital stock. In the following pages we discuss some theoretical and empirical issues relating to measurement of capital input.

1.1 Concept and Scope of Real Capital:

Capital may be defined narrowly as produced means of production or it may be defined broadly to include all or a part of the factors of production in the economy. According to ward (1976), "broadly defined, the concept of capital relates to the stock of domestic reproducible tangible assets that exist in a country ^{2/}. Kendrick's central conception of capital rests on the value of resources that society has devoted out of past

production to provide for future output.

Capital is an input in the production process along with land, labour and enterprise to produce goods and services in an economy 3/. Accordingly, a large assortment of goods fall under the category of capital e.g. building and construction, plant and machinery, transport equipment etc. Inherent in the broad definition of capital are the notions of durability and the potential to contribute to future production. Assets like land, minerals and timber are also durable and contribute to future income. Although these assets are tangible; yet they are not reproducible in the strict sense of the word and hence do not form part of the stock of fixed capital. While in theory capital is a composite commodity made up of different types of capital goods each with its own characteristics and useful economic life, its measurement is difficult because of problems of aggregation 4/.

There are a number of empirical problems in the measurement of capital besides that of aggregation. Firstly the composition of fixed capital undergo a change which makes temporal comparisons difficult. Secondly, replacement or fresh addition of assets is not necessarily done using the same type of assets. Newer assets may be more productive, i.e., technologically superior 4/. Hence in a growing economy capital stock existing at a point of time has no one-to-one correspondence to the current market valuation. Occurrences of second hand transactions are exceptions rather than the rule. Finally the productivity of a capital asset does not remain same over its

economically useful life. This renders it difficult to measure capital with reference to its original cost. There are also problems in relating the decline in productive capacity, and depreciation as provided in the books of account replacement cost of capital.

All these problems are related to the measurement of capital. To aggregate, all the components should be reduced to a common denominator. Since most of the transactions are specified in terms of money a natural common denominator appears to be money value. But since value of this measuring rod itself changes over time, the problem of converting various components of capital to a base-period price, poses a serious challenge. These problems are discussed in detail in the following sections.

1.2 Measurement of Capital : Theoretical Issues:

There is widespread agreement that the working definition of real capital but less than full agreement on what the definition is supposed to approximate. There seems to be four main contenders for the definition of capital in real terms: instantaneous productive capacity, long-run productive capacity, cumulative depreciation foregone and real wealth.

Significance of a capital stock lies in its earning power. Hence a forward looking concept of capital is that it is the discounted future stream of incomes to be derived from it. Capital is also measured by the amount of resources that would have been required in the base year to produce the goods. This is backward looking concept of capital. Thus by this method if

two machines bought at two different time periods had the same cost in base year, they are considered to embody the same amount of capital regardless of the differences in their ability to contribute towards production. In a state of "perfect tranquility" ^{5/} the two concepts must give the same value and the rate of discount which makes it equal should be the rate of interest or rate of return.

Since the future cannot be predicted with certainty, cost of capital remains the only measure of value of capital. Towards this end, Denison (1957) has proposed three methods, (a) measurement by cost (b) measurement by the capacity of the system as a whole to produce output (c) contribution capital makes towards production. Denison favours the first method because the second method would not be of much use as it makes capital productivity constant, and the third method calls for methods of accurate independent measurement.

Another related concept is the replacement cost concept. In the absence of future markets, it is difficult to assess the value of replacement cost through the prices of second hand goods. It is extremely difficult to find replacement value of a machine or equipment of similar type because of severe index number problems. These problems arise because although we may be able to reproduce today the capital goods made thirty or forty years ago, the reverse is not true. If we wish to value today's capital stock by the amount of resources that would have been required thirty years back, we have to assume that price index for capital goods which did not change in technical design, also represents the price index for capital

goods which changed. Ruggles and Ruggles (1961) observe that this assumption is likely to be invalid because the newly introduced capital goods tend to be those for which cost of production has fallen fastest.

In estimating the capital series, important choices arise in respect of depreciation and obsolescence. Kendrick (1956) argues that capital embodied in a specific asset continues to decline over time due to depreciation and obsolescence. While Denison agrees with Kendrick on depreciation but differs on obsolescence. He argues that obsolescence should be charged at the time of discarding of capital goods and it should be computed as deduction from gross capital formation rather than as an addition to capital consumption. Ruggles and Ruggles question the relevance of such an approach. When efficiency improvements have been excluded it seems incongruous that decrease in efficiency should be so carefully taken into account. Considerable empirical evidence suggests that adjustments for decline in productive capacity are unwarranted because efficiency of assets does not decline as fast as accounting procedure of depreciation show.

Barna (1961, 91) holds that "in most industries which are capital intensive the efficiency of plant increases rather than decreases with life. Increased cost of maintenance can rarely be encountered, since plant is generally scrapped before this occurs; the danger to be avoided is not so much an increase in the actual cost but rather the loss of working time caused by breakdowns". "In the wider field it is obsolescence rather than

wear and tear which is the dominant cause of mortality-homicide to make room for a new favourite, rather than natural death". Leontief (1953) states "recent information indicates that the undepreciated coefficients correspond much more closely to the incremental coefficient than to the depreciated ones" . Domar (1961, 99) has another important point in favour of gross capital figures " one might prefer some net figure to gross but working with net investment and net stock of capital in the conventional sense one might lose sight of gross investment as a major vehicle of technological progress. It makes a good deal of difference whether the same stock of capital lasts indefinitely or whether now one part of it and now another is replaced by new capital of superior efficiency. Hence gross figures may be more meaningful, with some unknown deduction of a smaller magnitude than conventional depreciation to account for the deterioration of existing capital".

In this connection Hashim and Dadi (1973) point out that a large amount of expenditure is incurred by firms to maintain the productive capacity of assets much longer than accounting reinvestment. Even though some part of the expenditure is capitalised (at present there is no published study on that) yet a large part of such expenditure is expended in that year. If so, then the so called gross value added is in fact net value added and there is no need for subtracting depreciation from the gross value of capital stock to find out the net value of capital stock 6/.

From the foregoing discussion it is clear that gross value of suitably adjusted purchase price^{7/} is the most useful concept

in theory and for empirical work. Thus we propose to use this concept to measure the capital stock in the manufacturing sector in India.

1.3 Measurement of Capital : Empirical Issues:

In empirical studies economists have tried to tackle the problem of aggregation by converting the capital stock at some base period prices (what it would have cost in the base period, rather than its ability to contribute to production). Similarly gross additions to the capital stock and capital consumption are valued in terms of base year costs for the particular type of capital goods produced or discarded. Basic to this concept of the quantity of capital is that only cost-associated quality change of capital goods is counted as quantity change.

Apparently the concept looks simple and easy to measure. But practical measurement of capital even as a cost measure is full of difficulties B/. Some of these have been addressed in this paper.

1.3.1 Earlier Capital Estimates:

Measurement of capital has attracted the attention of many researchers. Most of these efforts have largely been to estimate the capital stock at national level. The first comprehensive works in the field were made by Mukherjee and Sastry (1959) and Datta and Vinod Prakash (1960). This was followed by Reserve Bank of India (1963, 1972). However these studies did not provide comparable time series for a long run. Various efforts have been made by subsequent researchers like Mukherjee (1971), and Pratap Narain and Khera (1972) who attempted to

present the growth of tangible wealth in the country taking into account estimates available from the above mentioned studies. Recent attempts by Datta Roy Choudhory (1977) and Pratap Narain and Katyal (1980), attempt to present the estimates at the sectoral level and to adjust some of the previous bench-mark estimates to give a comparative picture of the growth of capital stock in various industrial sectors of the economy, over time.

Some other attempts in this direction may be seen in Gothoskar and Shankar (1972), Kumar, Sarkar and Narain (1977), Kapoor and Khera (1977), Shankar (1981), Chaturvedi and Bagchi (1984), T. Rama Rao (1984), Goldsmith (1983), Dholakia (1983), and finally CSO (1988).

Though there have been various attempts at estimating capital stock at the aggregate level, yet there are no published time series of capital stock in manufacturing industry in India. This study attempts to estimate capital stock in registered manufacturing sector in India.

1.4 Estimates of Fixed Capital stock:

The present study confines itself to the measurement of fixed capital stock in 42 large industries in registered manufacturing sector in India from 1960 to 1986-87, the latest period for which data is available from Annual Survey of Industries (ASI) till January 1991. These 42 industries account for about 70-76% of total output of registered manufacturing sector in India between 1973 to 1987.

1.4.1 Methodology For Estimating Fixed Capital Stock:

We chose 1960 as a starting year because, (a) Census for Manufacturing Industry (CMI) estimates were replaced by ASI in 1959 and hence a consistent series is available from 1960, (b) Hashim and Dadi (1973) and Dholakia (1983), provide gross-net ratios for estimating Gross Fixed Assets in the base period.

Since the series has to be extended to 1986-87 a correspondence between ASI classification followed till 1971 and NIC-1970 followed subsequently had to be found. The correspondence used in the study is given in Table 1. Estimates for factory sector for 1973-74 provided correspondence at 2 digit level and therefore a product-wise matching from 1978-79 (NIC-70) to ASI 60 was done and finally this correspondence was checked with 1973-74 ASI for census sector which provided this correspondence. The correspondence matched largely but wherever there were differences we persisted with correspondence obtained through product-wise classification. Aluminum (305) and Coal Tar from coke ovens (306) which corresponded to Non Ferrous Basic Metals (NFBM,342) and chemical products (329) respectively, formed only a part of these latter industries. These were disaggregated by making suitable assumptions as will be discussed later. In spite of our attempts to ensure strict correspondence, yet certain problems could not be avoided because of lack of appropriate information 2/.

1.4.1 Gross Net Ratios:

To get the gross fixed capital stock series in the base

year, at purchase prices gross-net ratios were applied. The ratios have been taken from Hashim and Dada (1973, p.14-15) and Dholakia (1983, 109). Wherever direct correspondence between industries were not found the ratios for the next closer industry were used. The gross net ratios applied for 1960 estimates are given in Table 2. By applying these ratios industry-wise and asset-wise, estimates of gross fixed capital at purchase prices for the base year 1960 were found. The industry-wise asset-wise estimates for the beginning and the terminal years of the study are given in Table 3.

Before proceeding further with the methodology the following adjustments were found necessary in case of Aluminum and Coal Tar industries estimates for the base year 1960. It is assumed that proportion of capital used for a product is same as the proportion of output for that product in total output of that industry or capital output ratio is same for all the products in that industry; for example these industries are Aluminum (NFBM) and Coal Tar (chemical products) in our case 10/. Though it does not seem to be very unrealistic assumption, deviations in capital output ratio within the similar product category cannot be ruled out. In that case the capital employed for a product category in an industry would be different. Yet, it is expected that these deviations would not be significant enough to make these estimates unreliable.

Once industry-wise asset-wise break up is obtained for the bench mark year i.e. 1960, capital series is developed using perpetual Inventory Method (PIM) 11/, in which the time series

of capital is built up step by step from time series of rupee value of investment and prices of capital goods.

Let K_{0ij} denotes the base period capital stock of i th asset in j th industry, I_{tij} the net investment in asset i in period t in the same industry DE_{tij} is depreciation of i th asset in year t , and DI_{tij} the amount of i th assets discarded during year t 12/. Then we can write fixed capital stock for industry j in year T , denoted by K_{Tj} as:

$$K_{Tj} = \sum_{i=1}^4 K_{0ij} + \sum_{t=1}^T \sum_{i=1}^4 (I_{tij} + DE_{tij} - DI_{tij})/P_{ti}$$

$j = 1, 2, \dots, 42$

$i = 1, 2, \dots, 4$

$t = 1960 - 1986$

P_{ti} = Price Deflator for i th asset in period t

This is the equation used to estimate the asset-wise fixed capital stock for i th capital asset in j th industry. The methodology followed for estimating Investment in industry j in asset i during t th time period I_{tij} is given by :

$$I_{tij} = (B_{tij} - B_{t-1ij}) * a_{ij}$$

Where B_{tij} is the book value of i th fixed asset of j th industry in period t and B_{t-1ij} is the book value of the same asset in the previous year and a_{ij} is the proportion of i th asset in total assets i.e. $a_{ij} = A_{ij}/A_j$ where A_{ij} = value of i th asset in industry j and A_j = Total assets in industry j .

Here the assumption is that total investment in an year, say 1970, is divided according to the proportion of the assets existing at the end of the prior period, i.e., 1969. This

assumption to be quite valid because one would expect some amount of complementarity between assets, though complementarity may not be linear. Since it dynamises the investment pattern as the proportion of assets change, this assumption is better than assuming that base period proportions hold good for all the years. One may, however, argue that the changes in the asset structure may not be significant enough to change the investment patterns and the asset-wise estimates of fixed capital; a cursory look at the data does not support such argument. One may have to compute the entire series on the assumption of 'structure constancy of assets hypothesis' to find out the likely magnitude and direction of error 13/.

ASI has given estimates of different types of assets added and discarded, only at 3 digit level while industry-wise estimates are given at 4/5 digit level. These figures at 3 digit level were reclassified to correspond to our industry grouping, while industry-wise actual addition and discarding were used till 1971 (see Appendix I for methodology and table 4 for correspondence) for post 1971 period explicit assumptions about the useful economic life of each class of assets were made. This has been discussed in the following section.

Data for assets added and discarded is not available for the years 1961, 1962 and 1967. For the years 1961 and 1962, assets discarded were taken as the average of proportion of assets discarded to total fixed capital (see Table 5). For 1967 average of 1966 and 1968 was used.

1.4.2 Asset-wise breakup of depreciation:

The figure of depreciation allowance reported in ABI relate to the aggregate depreciation figure for all type of fixed assets. However for estimating the gross capital stock we require the estimate of asset-wise depreciation. Following Dholakia (1983) we have used the depreciation rates for different types of assets : 7 per cent of Building and construction; 9% for plant and machinery; and 12% for other fixed assets. We have computed the depreciation charges on the basis of these rates and worked out asset-wise depreciation on the basis of actual depreciation figure for the year in the following manner for an industry say j for year 1961.

$$D_{Bj} = .07 \times B_{j1960} = A_1$$

$$D_{Mj} = .09 \times M_{j1960} = A_2$$

$$D_{Oj} = .12 \times O_{j1960} = A_3$$

$$A = \sum_{i=1}^3 A_i$$

$$\text{Actual depreciation} = D_{j1961}$$

$$\text{Therefore } D_{Bj} = A_1/A * D_{j1961}$$

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Where

- D_{Bj} = Depreciation on Buildings in industry j
- D_{Mj} = Depreciation allocated to Plant and Machinery
- D_{Oj} = Depreciation allocated to Other Fixed Assets
- B_{j1960} = Capital Stock of Buildings in industry j
- M_{j1960} = Stock of Plant and Machinery in industry j
- O_{j1960} = Other Fixed Assets in Industry j

Similar method of adjustment was used for adding discarding of assets. Groes (1976) states that "no way of depreciation proved itself obviously correct or useful. More important than refining these survival function,....., even more important would be putting the disaggregated capital figure into a wider production function. Thus while depreciation may be necessary to

derive the gross fixed stock but it is no substitute for actual survival of capital in an industry which relates to wear and tear and technological obsolescence. Which will require studies of capital mortality in industry and according to our knowledge at present there is no published account of mortality studies in India.

Finally the additions and discarding was done at 70-71 prices, by deflating each type of asset separately. The deflators used for the purpose of this study are given in Table 6. The methodology used is as following:

$$B_{1961} = B_{1960} + \left(\frac{IB_{1961}}{IPD_{const}} \right) + \left(\frac{DE_{1961}}{IPD_{const}} \right) - \left(\frac{DI_{1961}}{IPD_{const}} \right)$$

IB_{1961} = Investment in Buildings during 1961

IPD_{const} = Implicit price deflator for construction

DE_{1960} = Depreciation apportioned to Buildings for the year 1960

DI_{1960} = Buildings discarded during 1961

This methodology of discarding assets was followed till 1971. In the absence of data on actual addition and discarding of assets from 1972 onwards explicit assumptions about the life of assets have to be made for discarding the assets. CSO (1988:8) has given average age of fixed assets in its estimation of capital stock. Katyal and Gupta (1984,78) have also given the average life for different class of assets and their estimates are also comparable to CSO except in case of a few industries

where they have given different economic life of machinery. However, on the basis of data on actual addition and discarding of assets from 1963-71, it seems that economic life of each type of assets is much more than suggested by CSO or by Katyal and Gupta. For our purpose of discarding we have made following assumptions regarding the life of each type of assets.

Building (Pucca)	100 years
Plant and machinery	30 years
Transport and DFA	15 years

Accordingly our estimates of discarding are much closer to the actual (see Table 7) and also close to Goldar's (1986) estimates of annual discarding rate of 3.2%. From the available information on asset discarding it is evident that actually the assets economic life is much higher than usually presumed.

Secondly after 1971, discarding of assets is taken to be a constant fraction of previous year capital stock 14/

Since no survey was undertaken in 1967 (See ASI 1968 Vol. 1, 88) and in 1972 because of change in ASI code to NIC-1970, the figures for these two years were found by the following four methods.

- a) Trend 1973-86 extending backwards to 1967
- b) Trend 1960-71 extending to 1972
- c) Average of 1966 and 1968 values and of 1971 and 1973
- d) Interpolation

The error rate in case of trend figures is quite high, varying from 20% of average of 230%, interpolation comes quite close to average. For simplicity we have used average figure for these two years.

The assumption would only affect the time-path of investment and hence the likely error is not likely to be significant since price-increases are more or less same in these two periods (refer Table 5.)

$$DI_{ti} = K_{t-1i}$$

as compared to pre 1971 methodology whose assets discarded as a fraction of same year's capital stock.

$$DI_{ti} = K_{ti}$$

The capital series thus arrived at is given in Table 8 covering the period 1960-61 to 1986-87. 15/

2.0 Summary and Conclusions

The present study is an attempt to estimate the stock of fixed capital in large registered manufacturing sector in India. Though at present several theoretical as well as empirical questions remains unanswered, yet it is hoped that subsequent research could focus on important empirical issues to improve the estimates. Further research in the areas of replacement cost, disaggregation of other fixed assets, aggregation problem and adjustment in decline in the productive capacity of capital stock through studies of mortality of capital and technological obsolescence will be invaluable.

Notes

- 1/. This reflects that measurement of capital has largely been confined to individual researchers and hence is limited to researcher's scope and coverage of study and therefore no systematic estimates of capital stock are available. See also Goldar (1986,50)
- 2/ See ward (1976,208)
- 3/. Capital features as one of the factors of production in growth theories of early classical authors like Adam Smith (19) and neoclassical authors like Solow(), Meade ()
- 4/. The problem of aggregation in the measurement of capital has been dealt in detail in Diewart (1980)
- 4/ Z. Griliches points out that the most serious problem in measuring capital is the one caused by changing nature of the items being measured or priced- the quality change problem.
- 5/. Joan Robinson, some problems of definition and measurement of capital, in collected Economic Papers, Vol. II, Oxford, Basil Black Well.
- 6/. For details see Goldar (1986,53-54) The arguments for using gross or net stock in productivity or capital output ratio studies have received much attention in the literature. This has been discussed in detail in Goldar (1986).
- 7/. Griliches offers an argument that to arrive at capital series at base period costs, machinery should not be deflated by a machinery price index but by some more general price index for the economy as a whole, since all relative machinery prices changes are presumably a reflection of change in real costs.
- 8/. There is a difference between economist's view of capital- which looks at the physical production possibilities and an accountant's view of capital as the financial resource which enable the production possibility. Ward (1976) has suggested 10 different concepts of capital according to the different objectives.
- 9/. Besides classification, transfer of units across industries poses a major problem especially when it forms a part of different industry (in contrast to when it is transferred within a group say 319.1 to 319.3 both of which form a part of industry 319 (NIC-70)). Wherever it was possible to incorporate information because of non availability of break-up only this

information has been included. Besides this, there are problems of incomparability across years because of change in scope and coverage of industries over the years in ASI. Also see Dholakia (1983) and Goldar (1986) for some of the problems of comparability of data.

- 10/. Industries mentioned in the brackets represents the ASI industries while the industries outside these brackets corresponding to NIC-70 are a fraction of these ASI industries.
- 11/ There is a large number of articles explaining Perpetual Inventory Method (PIM). PIM was developed by Goldsmith (1956). For details see Jagdish Kumar, R.P. Katyal and S.P. Sharma (1986, 14) also see Ward (1976) for some other issues relating to the use of PIM in developing countries alongwith a case study of Lesotho. For some problems relating to the use of PIM see Usher (1980).
- 12/ We have taken four different types of assets i.e. Land, Buildings and Construction which includes improvements to land, Plant and Machinery which includes machine tools and Other Fixed assets.
- 13/. Asset-wise estimates for all the years can be made available on request.
- 14/. This is because till 1977 we had the data on actual additions and discarding which was derived as per the methodology explained in appendix 1. We had taken assets discarding as a proportion of same period's capital stock while computing the average rate of discarding of assets. Alternative assumption however is unlikely to make any difference as assets discarded on the basis of average discarding were higher because these were applied to gross fixed stock of that year as compared to the calculation of average discarding rate which were based on the net capital stock of that year and these apportioned according to the actual data.
- 15/. Till 1971 the data used belongs to the Census Sector and from 1973-74 ASI data is available for the entire factory sector. It creates problem of data compatibility. However it is important to note that Census sector accounts for about 95-98% of total fixed capital in the factory sector. The Census sector accounted for 96.12% in 1966, 95.08% in 1968, 95.63 in 1965 and 98.19% in 1973-74 for 4 years for which data for both could be obtained. The figures after 1971 were not inflated to account for sample sector because a) The study covers large industries within census sector also and hence sample sector in these industries is likely to be insignificant and b) In some of the cases because of lack of availability of disaggregated information the reported figures for the industry are overstated. By netting these

two effects the error range could be from 0-5%, which we will have to live with in the absence of better and more disaggregated information.

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appendix 1

Methodology for Addition and Discarding of Assets

To illustrate the methodology followed let us take the example of industry 209 of ASI 1960.

209 of ASI cover 210 (P) (Refer Table 1) 211 (P) and 212 (P) of NIC 1970 (P is partly).

Figures of assets added and discarded have been given for the industry 209. To find out addition and discarding of assets in industry groups 210, 211, 212 (which correspond to 209 of ASI) the following methodology was used.

Total of fixed capital in industry 209 for each year was found by totaling 4/5 digits industries constituting 209. The proportion of coverage of 209 by 210, 211, 212 was found using

$$\sum_{i=1}^3 K_i / K_{209} = b_i \quad i = 210, 211, 212$$

Where K_{209} is the total of industry 209 and K_i is the total of industries falling under 209 in our sample or in other words b_i represents the coverage of an industry in our sample. Now we find the relative weights of each of the industries in 209 covered by us to the total covered i.e.

$$K_{210} / \sum_{i=1}^3 K_i = P_{210}$$
$$K_{211} / \sum_{i=1}^3 K_i = P_{211}$$
$$K_{212} / \sum_{i=1}^3 K_i = P_{212}$$

Thus P_i represents the relative weight of each of the industries. Then asset added and discarded were distributed proportionately in the following manner:

AA210 = L + F210 (assetwise)

AA210 is assets added in industry 210 and similarly methodology was used for other industries also.

Similar methodology was followed for other industries constituting the larger grouping:

231	(231,232,247,251)*
311	(310,311,312,316)
319	(313,314,319)
341	(330,331)
350	(340,343)
360	(352,353,356,360)
370	(360,361,362,364)

* The figures in brackets sho correspondence of NIC to ASI.

Correspondence Between NIC 1978 and ASI

NIC-78 Industry Description	ASI Description Of the Industry
18 386 Products of Coal Tar in Coke Ovens	329 Miscellaneous Products of Petroleum and Coal 329.999 Others
19 310 Manufacture of Basic and Industrial, Organic and Inorganic Chemicals and Gases such as acids Alkalies and their salts,gases like Acetylene Oxygen, Nitrogen etc.	311.2.1 Heavy Chemicals- In organic 311.2.2 Heavy Chemicals- Organic 311.1.1 Inorganic Fertilizers 311.1.3 Mixed Fertilizers
20 311 Manufacture of Fertilizer and Pesticides	319.2 Insecticide, Fungicide and Weedicide
21 312 Manufacture of Paints, Varnishes and Lacquers etc.	311.7 Dye Stuffs 313 Manufacture of Paints, Varnishes and Lacquers 319.11 Sizing Materials, Waxes Polishes etc.
22 313 Manufacture of Drugs and Medicine	319.5 Drugs and Pharmaceuticals.
23 314 Manufacture of Perfumes, Cosmetics, Lotions Hair Dressings, Tooth Pastes, Soap in any form, Synthetic Detergents, Shampoos, Shaving Products Cleaners, Washing and scouring Products and Other	319.6 Soaps and Glycerine 319.7 Perfumes Cosmetics and other Toilet Preparations
24 315 Manufacture of inedible oils	312.1 Vegetable Oils incl. Solvent Extracted Oils 312.2 Others
25 316 Manufacture of Turpentine, Synthetic Resins Plastic materials and Synthetic Fibres like Nylon, Terylene except Glass	311.3 Synthetic Resins and Plastics 311.5 Man Made Fibres incl. Regenerated Cellulose Rayon Nylon etc. 311.8 Turpentine and Rosin 311.9 Products of Fermentation Industries other than Alcohol 311.104 Organic Chemicals, Synthetic Rubber,Product and other Basic Ind. Chem.
26 319 Manufacture of Chemical Products n.e.c.	319.1 Fine Chemicals incl. Photographic Chemicals 319.3 Textile auxiliaries 319.4 Sizing Material 319.9 Lac incl. Shellac 319.10 Glue and Gelatine 319.12 Manufacture of Miscellaneous Chemical Products- Others.
27 324 Manufacture of Cement Lime and Plaster	334 Manufacture of Cement
28 330 Iron and Steel Industries	341.1 Iron and Steel (Metal) 341.3 Iron and Steel Casting and Forging 341.4 Iron and Steel structurals 341.5 Iron and Steel Pipes
29 331 Foundries for Casting and Forging Iron and Steel	342 Non Ferrous Basic Metal Industries 342.999 Others

(contd.)

Table 1.

Correspondence Between NIC 1978 and ASI

NIC-78	Industry Description	ASI	Description Of the Industry
1	281 Manufacture of Dairy Products	282.1	Manufacture of Milk Foods
		282.2	Other Dairy Products
2	284 Grain Mill Products	285.1	Flour Mills
		285.2	Rice Mills
		285.3	Dal Mills
3	286 Manufacture and Refining of Sugar (Vacuum Pan Sugar Factories)	287.1	Sugar Vacuum Pan
4	218 Manufacture of Hydrogenated Oils, Vanaspati etc.	289.3	Hydrogenated Oils (Vanaspati)
5	211 Manufacture of Other Edible Oils and Fats	289.2	Manufacture of Edible Oils (Other than Hydrogenated Oils)
6	212 Tea Processing	289.4	Tea Manufacturing
7	230 Cotton Ginning, Cleaning and Bailing	239.1	Cotton Ginning Cleaning and Pressing
8	231 Cotton Spinning, Weaving, Shrinkin, Sanforizing, Mercerising and Finishing of Cotton Textile in Mill	231.1	Cotton Textiles
9	232 Printing, Dyeing and Bleaching of Cotton Textiles	231.7	Tex. Dyg., Bleaching, Finishing and Processing incl. Merc. Calen
		231.999	
10	247 Spg., Wvg., and Finishing of Other Textile	231.5	Art Silk
11	251 Jute and Mesta Spinning and Weaving	231.2	Jute Textiles
12	264 Manufacture of all type of Textile Garments Including Wearing Apparel	243.1	Clothing and Tailoring
		243.3	Others
13	288 Manufacture of Pulp, Paper and Paper Board	271.1	Pulp, Wood, Mechanical, Chemical incl. Dissolving Pulp
		271.2	Paper-Writing, Printing and Wrapping
		271.3	Newsprint
		271.4	Paper Board and Straw Board
		271.5	Paper for Packaging
		271.6	Hard Board incl. Fibre Board and Chip Board
14	298 Tanning, Curing, Finishing, Embossing and Japanning of Leather	291	Tanneries and Leather Finishing Plants
15	308 Tyre and Tube Industries	388.1	Tyres and Tubes
16	383 Manufacture of Plastic Products not elsewhere classified (except House Furnishing)	399.7	Plastic Moulded Goods
17	384 Petroleum Refineries	321	Petroleum Refineries

(contd.)

Correspondence Between NIC 1970 and ASI

NIC-70 Industry Description	ASI Description Of the Industry
31 340 Manufacture of Fabricated Metal Products such as Metal cans from Tin-Plate, Turn-Plate or Enamelled Sheet Metal, Metal Shipping Containers Barrels, Drums, Kegs and Other fops n.e.c.	350.1 Metal Containers and Steel Trunks 350.6 Welding 350.7 Safes and Vaults 350.9 Hurricane Lanterns 350.12 Sanitary and Plumbing Fixtures and Fitting of Metals 350.14 Manufacture of Other Metal Products Except Machinery n.e.c.
32 343 Manufacture of Hand Tools and General Hardware	350.3 Bolts, Nuts, Nails, Screws, Springs, Chains etc. 350.10 Hand Tools and Small Tools
33 350 Manufacture of Agricultural Machinery and Equipment and Parts	360.8.1 Tractors, Harvestors etc. 360.8.2 Agricultural Implements
34 352 Manufacture of Prime Movers, Boilers and Steam Generating Plants such as Diesel Engine and Parts	360.1 Boilers and Steam Generating Plants 360.2 360.3 Internal Combustion Engines
35 353 Industrial Machinery for Food and Textile Industries	360.4.1 Textile Machinery 360.4.2 Jute Machinery 360.4.3 360.4.4 Sugar Machinery 360.4.5 Tea Machinery 360.4.13 Oil Mill Machinery 360.4.14 Rice Dal and Flour Mill Machinery
36 356 Manufacture, Alteration and Repair of General Items of Non Electrical M/C and others n.e.c.	360.5.1 Size Reduction Equipment- Crusher Ball Mills etc. 360.5.2 Conveying Equipment- Buckets Elevators etc. 360.5.4 Mixers and Reactors - Kneading Mills, Turbo Mixers etc. 360.5.10 Others 360.5.11 Power Driven Pumps- Reciprocating, Centrifugal etc. 360.5.12 Air and Gas Compressors and Vacuum Pumps (contd.) 360.6.1 Ball Roller and Tapered Bearings 360.6.2 Speed Reduction Units
37 360 Electrical Ind. Machinery and Parts	370.1.1 Equipment for Generating, Trans., Disn. of Elec. incl. Transformers 370.1.2 Electric Motors
38 361 Insulated Wires and Cables	370.1.6 Electric Cables and Wires
39 363 Manufacture of Electrical Apparatus, Appliances and other Parts such Lamps, Bulbs Tubes, Sockets, Switches, Fans, Insulators (except Porcelain), Conductors, Irons, Heaters Shavers, Vacuum Cleaners Etc. Excluding Repairs	370.1.3 Electric Fans 370.1.4 Electric Lamps 370.1.9 Household Appliances- Electric Iron, Heaters etc. 370.4 Manufacture of X-Ray Equipment, Teleprinter and other Elec. Appl. and S

(contd.)

Correspondence Between NIC 1978 and ASI

NIC-78	Industry Description	ASI	Description Of the Industry
			378.2.1 Telephones
			378.2.2 Telegraph Equipment
			378.2.3 Wireless Communication Apparatus
			378.2.4 Radio Receivers, incl. Amplifying and Public Address System
			378.2.5
			378.2.6 Others
40	364 Radio, TV, Sound Reproducing and Recording Equipment including Tape Recorders, Public Address System, Gramophone Records and Pre-Recorded Magnetic tapes, Wire and Wireless Telephone, Telegraph Eqp, Signalling and Detection Radar and Other Electronic items.		378.3
41	372 Manufacture of Railway Wagons and Coaches and Parts		382.2 Railway Rolling Stock
			383.1 Manufacture of Motor Cars
			383.2 Buses and Trucks etc.
			383.3 Automobile Ancillaries
			383.4 Others
42	374 Manufacture of Motor Vehicles and Parts		383 Manufacture of Motor Vehicles.

Source: Annual Survey of Industries Various Issues

- Note:
1. All the figures of ASI industries are to be added to arrive at NIC except for the codes with extension .999 which are to be subtracted.
 2. This correspondence largely matches with the one given by CSO in 1973 issue of ASI for Census Sector
 3. Calculation of value for industries with code .999 is given in the text.
 4. Wherever there is no description of industry, these have been aggregated with other industries in the same sub-group.

Table 2.

Gross/ Net Ratios for Different Categories of Capital
For the Year 1960

ASI Industry No.	Hashim Dadi/ Dholakia	Bldg.	Gross-Net Ratio	
			P & M	OFA
201	20	1.5604	2.2170	2.1899
204	205	1.3781	2.6730	1.5200
206	207	1.6555	2.2164	2.4659
210	20	1.5604	2.2170	2.1899
211	20	1.5604	2.2170	2.1899
212	20	1.5604	2.2170	2.1899
230	239	1.7290	2.6647	2.1294
231	231	1.9432	2.3190	2.2413
232	231	1.9432	2.3190	2.2413
247	24	1.9536	2.3306	2.3212
251	239	1.7290	2.6647	2.1294
264	24	1.9536	2.3306	2.3212
280	271	1.4501	1.6906	1.8135
290	291	2.4860	2.8512	2.9528
300	300	1.3178	1.7100	1.6917
303	399	1.5455	2.7050	1.8143
304	321	1.3316	1.4973	1.8458
306	321	1.3316	1.4973	1.8458
310	311	1.2760	1.5382	1.6507
311	311	1.2760	1.5382	1.6507
312	313	1.8848	2.6083	2.2842
313	319	1.5043	1.8188	1.9680
314	319	1.5043	1.8188	1.9680
315	312	1.6850	2.4827	1.7095
316	311	1.2760	1.5382	1.6507
319	319	1.5043	1.8188	1.9680
324	334	1.3256	1.7122	1.8770
330	341	1.3297	1.5777	1.5778
331	341	1.3297	1.5777	1.5778
335	342	1.4723	1.8871	1.9982
340	350	1.3290	2.0077	2.0958
343	350	1.3290	2.0077	2.0958
350	360	1.3505	1.5564	1.5287
352	360	1.3505	1.5564	1.5287
353	360	1.3505	1.5564	1.5287
356	360	1.3505	1.5564	1.5287
360	370	1.3386	2.0392	1.9140
361	370	1.3386	2.0392	1.9140
363	370	1.3386	2.0392	1.9140
364	370	1.3386	2.0392	1.9140
372	382	1.4789	1.9872	1.7144
374	383	1.7376	1.6846	1.8238

Source: For all three digit industries in Col. 2.
Hashim and Dadi (1973), and for two digit
industries Dholakia (1983)

Notes: Explained in the text.

Table 3.

(All Values are in Lakhs of Rupees)

Estimates of Fixed Capital Stock Asset wise
For the Beginning and the Terminal Years.

ASJ	1962				1986-87				Total FA	
	Land	Building Imp. Land	Piant & Mnry.	Other F.Assets	Land	Building Imp. Land	Piant & Mnry.	Other F.Assets		
201	6.9	125.2	273.1	85.7	491.0	297	3581	12046	5258	21181
204	58.7	301.7	676.1	98.5	1126.9	347	4501	14659	2787	22294
206	109.6	2633.0	18217.7	1106.9	13867.1	289	13586	78215	12264	104453
210	30.2	343.2	868.2	103.3	1344.8	89	1716	6836	1170	9811
211	34.3	293.4	686.6	82.3	1016.6	141	2214	7128	1183	10586
212	69.8	2736.5	4014.5	357.7	7178.5	121	6257	18224	1787	28389
230	93.9	705.9	1168.4	72.7	2040.9	237	2518	5582	372	8628
231	502.5	7573.1	24944.4	1173.6	34193.6	1332	35643	185647	14736	237358
232	10.6	57.1	174.5	19.6	261.8	99	1507	6636	1159	9402
247	39.1	556.6	1843.9	144.3	2583.9	320	11113	61839	6871	80142
251	234.7	1497.9	6964.6	281.9	8979.2	304	3918	23731	1384	29256
264	0.0	2.0	37.5	11.5	51.1	53	475	2741	1181	4458
280	72.7	2152.9	5367.8	285.2	7878.7	330	16950	78163	11598	107033
290	14.0	105.7	201.3	36.4	357.3	219	1372	4900	1167	7659
300	18.0	280.3	710.2	55.3	1063.8	424	5567	26762	3595	36368
303	2.4	53.6	242.4	34.2	332.6	1159	1558	12802	4447	19966
304	163.4	1139.5	4091.0	750.7	6144.6	2656	8281	66176	21070	98182
306	0.0	1.4	10.2	1.0	13.4	131	552	5032	1192	6907
310	72.9	730.9	2846.4	258.6	3908.8	854	12815	91889	24978	130536
311	99.1	965.8	3035.1	670.2	4770.3	951	27032	160971	55047	244000
312	22.1	726.8	1168.2	227.3	2144.4	76	4747	16427	4060	25311
313	116.0	960.5	1362.3	538.7	2986.3	624	10560	29479	11856	52520
314	23.6	260.7	369.6	106.2	760.1	215	3275	9776	2779	16846
315	1.3	30.7	80.8	5.4	118.2	205	1646	9057	1681	12589
316	12.9	570.0	1275.0	60.7	1918.6	240	10120	55486	3804	69659
319	39.9	148.6	417.7	57.2	663.5	135	2700	10075	3545	16463
324	71.3	1955.4	5766.9	579.3	8371.9	1109	14300	86921	18848	121178
330	72.1	2795.1	23744.9	905.2	27517.3	280	37025	451955	22775	512035
331	99.1	1167.9	2356.2	329.6	3951.8	567	15328	57980	13353	87228
335	27.1	416.7	1154.2	83.5	1681.6	120	5360	26057	7766	40111
340	44.0	345.1	918.7	163.7	1471.5	192	2361	9743	2248	14536
343	37.7	257.2	1249.1	93.0	1637.0	134	2130	13866	2803	18941
350	5.4	49.2	75.6	14.7	144.8	99	2609	8047	2895	13639
352	30.7	211.8	428.0	92.9	764.2	172	5730	17300	4591	27001
353	51.3	490.4	1027.1	219.7	1788.5	70	4362	14453	3426	22311
356	21.6	114.9	331.0	41.1	508.6	236	5459	20063	5397	31156
360	30.4	258.5	517.0	103.6	909.6	244	12901	35136	8135	56417
361	27.2	374.8	1069.2	112.2	1583.4	132	4513	15871	2691	23207
363	38.0	267.8	617.6	94.4	1018.6	115	3310	11059	2533	17017
364	26.0	442.4	534.3	65.1	1068.6	201	5504	14119	2784	22609
372	103.4	1348.9	2421.2	137.7	4011.2	270	5062	9088	1222	16441
374	60.5	1485.3	3193.3	334.6	5073.7	407	15415	78686	13840	100340

Source: Calculated as per the methodology given in the paper

Table 4.

Correspondence Between ASI and NIC used
for Addition and Discarding of Assets
for the Period 1963 to 1971

Sr. No.	ASI	NIC
1	202	201
2	205	204
3	207	206
4		210
5		211
6	209	212
7		231
8		232
9		247
10	231	251
11	239	230
12	243	264
13	271	280
14	291	290
15	300	300
16		310
17		311
18		312
19	311	316
20	312	315
21		313
22		314
23	319	319
24	321	304
25	329	306
26	334	324
27		330
28	341	331
29	342	335
30		340
31	350	343
32		350
33		352
34		353
35	360	356
36		360
37		361
38		363
39	370	364
40	382	372
41	383	374
42	399	303

Source: Calculated on the basis of
other tables

Note: NIC codes are to be added to arrive at ASI e.g
to get the total value for the industry 209,
210,211 and 212 of NIC are to be added and to
find the value of 231, 231,232,247 and 251 are
to be added.

Table 5.

(Figures are proportions)

Proportion of Assets Discarded to Total Fixed Capital
For the Period 1963-1971

Ind. Code	1963	1964	1965	1966	1967	1968	1969	1970	1971	Average
201	0.0038	0.0040	0.0053	0.0008	0.0014	0.0019	0.0095	0.0077	0.0121	0.0053
204	0.0143	0.0133	0.0193	0.0202	0.0647	0.1092	0.0134	0.0410	0.0144	0.0344
206	0.0096	0.0101	0.0100	0.0112	0.0195	0.0279	0.0150	0.0156	0.0227	0.0157
210	0.0130	0.0093	0.0116	0.0126	0.0163	0.0201	0.0184	0.0168	0.0199	0.0153
211	0.0130	0.0093	0.0116	0.0126	0.0163	0.0201	0.0184	0.0168	0.0199	0.0153
212	0.0130	0.0093	0.0116	0.0126	0.0163	0.0201	0.0184	0.0168	0.0199	0.0153
230	0.0103	0.0211	0.0253	0.0245	0.0210	0.0190	0.0346	0.0230	0.0240	0.0220
231	0.0119	0.0090	0.0107	0.0104	0.0053	0.0001	0.0125	0.0146	0.0116	0.0096
232	0.0119	0.0090	0.0107	0.0104	0.0053	0.0001	0.0125	0.0146	0.0116	0.0096
247	0.0119	0.0090	0.0107	0.0104	0.0053	0.0001	0.0125	0.0146	0.0116	0.0096
251	0.0119	0.0090	0.0107	0.0104	0.0053	0.0001	0.0125	0.0146	0.0116	0.0096
264	0.0348	0.0479	0.1360	0.0119	0.0262	0.0404	0.0377	0.0236	0.0163	0.0417
280	0.0057	0.0050	0.0041	0.0039	0.0080	0.0122	0.0201	0.0177	0.0174	0.0105
290	0.0121	0.0137	0.0205	0.0001	0.0230	0.0300	0.0134	0.0554	0.0165	0.0223
300	0.0044	0.0093	0.0072	0.0336	0.0320	0.0304	0.0377	0.0200	0.0611	0.0263
303	0.0332	0.0499	0.0632	0.0335	0.0321	0.0250	0.1007	0.0774	0.0252	0.0496
304	0.0010	0.0151	0.0013	0.0049	0.0160	0.0207	0.0530	0.0040	0.0151	0.0156
306	0.0000	0.0002	0.0006	0.0032	0.0001	0.0129	0.0209	0.0042	0.0223	0.0009
310	0.0145	0.0073	0.0145	0.0052	0.0041	0.0029	0.0413	0.0036	0.0062	0.0199
311	0.0142	0.0071	0.0142	0.0051	0.0040	0.0020	0.0410	0.0020	0.0060	0.0196
312	0.0123	0.0063	0.0126	0.0045	0.0035	0.0025	0.0361	0.0732	0.0052	0.0174
313	0.0077	0.0101	0.0065	0.0002	0.0070	0.0073	0.0330	0.0216	0.0249	0.0151
314	0.0077	0.0101	0.0065	0.0002	0.0070	0.0073	0.0330	0.0216	0.0249	0.0151
315	0.0037	0.0064	0.0122	0.0055	0.0061	0.0066	0.0216	0.0061	0.0090	0.0007
316	0.0145	0.0073	0.0145	0.0052	0.0041	0.0029	0.0413	0.0036	0.0061	0.0199
319	0.0077	0.0101	0.0065	0.0002	0.0070	0.0073	0.0330	0.0216	0.0249	0.0151
324	0.0050	0.0044	0.0086	0.0141	0.0113	0.0006	0.0750	0.0220	0.0170	0.0107
330	0.0032	0.0023	0.0030	0.0016	0.0252	0.0409	0.0143	0.0234	0.0156	0.0153
331	0.0032	0.0023	0.0030	0.0016	0.0252	0.0409	0.0143	0.0236	0.0156	0.0153
335	0.0054	0.0032	0.0035	0.0026	0.0064	0.0103	0.0075	0.0053	0.0067	0.0057
340	0.0176	0.0005	0.0003	0.0006	0.0205	0.0323	0.0229	0.0100	0.0131	0.0167
343	0.0176	0.0005	0.0003	0.0006	0.0205	0.0323	0.0229	0.0100	0.0131	0.0167
350	0.0205	0.0104	0.0323	0.0109	0.0101	0.0092	0.0236	0.0139	0.0113	0.0176
352	0.0205	0.0104	0.0323	0.0109	0.0101	0.0092	0.0236	0.0139	0.0113	0.0176
353	0.0205	0.0104	0.0323	0.0109	0.0101	0.0092	0.0236	0.0139	0.0113	0.0176
356	0.0205	0.0104	0.0323	0.0109	0.0101	0.0092	0.0236	0.0139	0.0113	0.0176
360	0.0126	0.0000	0.0060	0.0071	0.0210	0.0349	0.0120	0.0007	0.0003	0.0134
361	0.0126	0.0000	0.0060	0.0071	0.0210	0.0349	0.0120	0.0007	0.0003	0.0134
363	0.0126	0.0000	0.0060	0.0071	0.0210	0.0349	0.0120	0.0007	0.0003	0.0134
364	0.0126	0.0000	0.0060	0.0071	0.0210	0.0349	0.0120	0.0007	0.0003	0.0134
372	0.0103	0.0060	0.0095	0.0019	0.0026	0.0033	0.0050	0.0057	0.0075	0.0057
374	0.0056	0.0130	0.0092	0.0047	0.0052	0.0057	0.0050	0.0040	0.0160	0.0079

Source: Annual Survey of Industries

Notes: Explained in the text

Table 6.

Implicit Deflator for Machinery, Construction
and Other Fixed Assets

(Base 1970-71 = 100)

Year	Construction	Plant & Machinery	Other Fixed Assets
1960-61	58.0	64.0	72.9
1961-62	61.0	66.0	73.2
1962-63	63.4	69.0	74.7
1963-64	64.7	71.4	79.7
1964-65	67.7	74.5	81.1
1965-66	72.8	78.4	84.0
1966-67	78.0	83.8	91.4
1967-68	82.5	87.3	95.2
1968-69	87.8	88.0	95.6
1969-70	93.9	90.4	97.7
1970-71	100.0	100.0	100.0
1971-72	106.1	104.5	107.5
1972-73	111.4	110.6	116.4
1973-74	124.6	122.2	124.0
1974-75	161.2	156.2	156.8
1975-76	175.1	173.2	170.8
1976-77	182.1	170.8	168.1
1977-78	189.7	172.8	171.8
1978-79	206.3	182.9	186.8
1979-80	237.1	211.4	229.9
1980-81	269.3	231.6	263.0
1981-82	317.9	254.2	298.0
1982-83	378.4	267.6	308.7
1983-84	426.1	283.8	307.4
1984-85	481.1	296.9	323.6
1985-86	529.8	326.6	372.2
1986-87	590.7	344.5	389.7

Notes: 1. Implicit deflator for Construction has been derived by chain-index method from 60-61 and 1980-81 as base years. Deflator for Machinery from various issues of National Accounts Statistics (NAS) and Machine Tools have been taken as Wholesale Price Index (WPI) of Machinery and Machine Tool and for other fixed assets WPI of Transportation has been used.

2. The Correlation coefficient between Implicit Deflator of Machinery derived from National Accounts Statistics (NAS) and WPI of Machinery is 0.996. Deflator for other fixed assets has been taken as transportation equipment, for one Transport equipment constitute one of the major components in OFA and secondly it is very close

to deflators used by other researchers.

Source: National Accounts Statistics, Various Issues
Database on Indian Economy by H.L. Chandhok
and Policy Group, 1990.

Table 7.

Proportion of Assets Discarded on the basis
of Different Assumptions

ASI	Col. 1 Assumptio 1	Col. 2 Ass. 2	Col. 3 Actual 60-71	Col. 4 Error % , 1	Col. 5 Error % , 2
201	0.0347	0.0514	0.0053	0.8969	0.8471
204	0.0297	0.0437	0.0344	0.2130	-0.1594
206	0.0326	0.0487	0.0157	0.6776	0.5178
210	0.0310	0.0461	0.0153	0.6678	0.5063
211	0.0294	0.0435	0.0153	0.6486	0.4802
212	0.0268	0.0396	0.0153	0.6132	0.4292
230	0.0258	0.0377	0.0228	0.3952	0.1159
231	0.0305	0.0455	0.0096	0.7892	0.6851
232	0.0312	0.0465	0.0096	0.7933	0.6927
247	0.0311	0.0464	0.0096	0.7933	0.6912
251	0.0306	0.0456	0.0096	0.7897	0.6859
264	0.0363	0.0541	0.0417	0.2292	-0.1486
280	0.0314	0.0469	0.0105	0.7761	0.6660
290	0.0308	0.0454	0.0223	0.5091	0.2764
300	0.0306	0.0455	0.0263	0.4221	0.1404
303	0.0351	0.0517	0.0496	0.0398	-0.4148
304	0.0364	0.0543	0.0156	0.7126	0.5715
306	0.0347	0.0517	0.0089	0.8279	0.7436
310	0.0352	0.0526	0.0199	0.6218	0.4346
311	0.0362	0.0542	0.0196	0.6380	0.4591
312	0.0322	0.0479	0.0174	0.6364	0.4591
313	0.0334	0.0494	0.0151	0.6945	0.5477
314	0.0315	0.0466	0.0151	0.6758	0.5202
315	0.0319	0.0476	0.0087	0.8170	0.7276
316	0.0302	0.0452	0.0199	0.5595	0.3416
319	0.0341	0.0507	0.0151	0.7021	0.5578
324	0.0336	0.0501	0.0187	0.6270	0.4431
330	0.0323	0.0487	0.0153	0.6857	0.5268
331	0.0322	0.0479	0.0153	0.6808	0.5251
335	0.0348	0.0520	0.0057	0.8904	0.8364
340	0.0326	0.0484	0.0167	0.6551	0.4874
343	0.0339	0.0507	0.0167	0.6705	0.5076
350	0.0329	0.0487	0.0176	0.6388	0.4645
352	0.0316	0.0468	0.0176	0.6240	0.4423
353	0.0315	0.0467	0.0176	0.6233	0.4410
356	0.0322	0.0478	0.0176	0.6320	0.4534
360	0.0307	0.0455	0.0134	0.7054	0.5632
361	0.0307	0.0456	0.0134	0.7061	0.5632
363	0.0311	0.0461	0.0134	0.7094	0.5689
364	0.0285	0.0420	0.0134	0.6810	0.5294
372	0.0269	0.0394	0.0057	0.8555	0.7878
374	0.0323	0.0481	0.0079	0.8359	0.7551

Source: Col. 3. pertains to the actual data (refer table 6)
while figures for col. 1 and col. 2 have been
calculated as per the assumptions given above.

- Notes:
1. Assumption 1 has life of Land & Building 100 years Plant and Machinery 30 years and Other fixed assets which includes Transport equipment and other assets as 15 years.
 2. Assumption 2 has life of these assets being 80,20 and 10 years respectively as suggested by Central Statistical Organisation (CSO,1988)

All Values are in ('000 Rupees)
Capital Stock in Registered Manufacturing Sector in India Since 1960 to 1972

ASI	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
201	49102	88392	110142	185039	257850	292254	323820	362796	404158	440024	489223	562171	626098
204	112695	130564	130695	146707	162157	186590	184955	195547	206166	219498	226329	268083	432793
206	1386714	1581349	1779553	1924529	2184148	2393423	2626213	2828232	3032676	3365441	3630298	3920165	4179314
210	134484	138127	143513	159455	177495	193393	236455	243895	250055	269563	323351	383452	405874
211	101657	118838	128145	143333	174542	193283	192683	200961	208965	205092	217109	249485	328771
212	717854	745942	833788	888078	1011795	1056798	1097200	1138321	1179169	1235479	1286908	1378003	1466805
230	204091	209456	208113	224039	253562	270460	257358	264058	270690	290323	301258	332971	392538
231	3419362	4173525	4840610	5557778	6347047	7062841	8097432	8608328	9113756	9701958	10226259	10802303	11468323
232	26182	50861	79117	82376	107181	128689	139580	180208	220296	198329	219442	269446	281882
247	258393	301224	516934	826880	1012028	1107703	1377068	1645418	1928964	2018422	1983643	2078059	2319857
251	897917	951460	1026890	1188153	1326583	1463552	1513209	1590794	1664361	1694816	1786023	1855146	1935126
264	5109	6147	6763	7380	9414	12308	18307	21737	25133	26652	30231	46297	56554
280	787868	860047	1120351	1304518	1680819	1863990	2160123	2404354	2651701	2919613	3173010	3382316	3496055
290	35735	35855	35840	39219	45578	53994	61674	67845	74334	89817	99324	109765	129798
300	106378	143295	296063	331195	397525	437766	468325	516967	568380	640701	737268	842290	887530
303	33263	39061	46170	48758	58610	63035	87946	110168	132764	133108	161934	193437	304287
304	614465	637525	842615	862108	953061	1704529	2168299	2223045	2289313	2524471	2933363	2946090	2769943
306	1345	1675	6184	4579	6119	6827	6565	6703	6834	8626	7570	11997	30693
310	390878	462881	515397	596927	717558	881276	971191	1501933	2045901	2522465	2532434	3108079	3349170
311	477028	944247	1030540	1164438	1289714	1591858	1781735	2634969	3518714	5132108	6233782	6181256	7328580
312	214441	258765	302257	363070	485732	598618	672551	725457	777935	860818	944561	1035821	1139636
313	298634	391482	479740	589305	717211	790512	1088558	1293758	1508313	1644221	1764086	1909252	2040220
314	76009	84409	93072	110975	140533	162723	155499	204628	258160	292970	325580	371971	448691
315	11820	31587	38481	59140	72165	110433	126013	130490	134823	140214	154150	160003	178333
316	191857	626815	651487	1082756	1153165	1365066	2258742	2292831	2337799	2254127	2422688	2932501	2955206
318	66347	88162	74283	125585	128959	172146	226908	223279	230539	243018	381570	446127	696639
324	837288	898920	932468	1039147	1201509	1338531	1455146	1737318	2008739	2160999	2625984	2691658	2749836
330	2751728	2999116	11035904	11933265	12688229	13508373	15600694	16476214	17424403	17822772	18350885	18722228	19309611
331	395177	480243	629816	984699	1345682	1799420	1445962	1842767	2261031	2800224	3147829	3465627	3819341
335	168157	155478	413140	378410	481812	705647	739075	759192	781591	852001	1011300	1157691	1522526
340	147154	199439	240935	282124	339730	399619	445892	458866	471377	512011	589283	665632	683292
342	163699	194492	272736	321901	320508	464861	574296	569406	585297	767860	805859	820761	885035
350	14482	18682	29657	28643	63102	97211	133543	155098	176892	223568	260178	309541	423066
352	76420	119118	172250	202518	261234	312475	645984	690771	739081	830497	861149	888387	983940
353	178852	226981	291002	358936	418761	461447	507615	550607	594159	606805	661310	705620	805366
356	50856	74532	89083	136697	229214	394673	487946	551206	615779	615850	693448	774469	875303
360	90963	124102	434488	710362	893421	1036628	1701277	1868255	2035287	1758101	2924227	3075971	2908203
361	158340	214061	239012	280635	423757	532031	652246	699164	744782	806681	833792	884382	970339
363	101857	128775	153207	180438	210567	248076	319401	373857	430051	457119	560018	571043	617436
364	196856	127434	141261	181044	211529	239880	280298	314223	349152	378879	403461	458441	551952
372	401125	444017	528180	620238	704948	729205	789239	869561	951088	973190	973256	993825	993421
374	507371	643035	801889	963714	1354179	1741813	2420445	2650444	2883590	2946033	3172661	3335061	3625971

All Values are in Lakhs of Rupees
Capital Stock in Registered Manufacturing Sector in India Since 1973-74 to 1986-87

Sl	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
201	6863	7914	8935	9973	10435	11379	12043	13168	13742	14579	15944	18157	18706	21181
204	5886	6451	6936	7681	8550	10331	10739	11647	13347	15134	23037	18828	20990	22294
206	44257	47823	51314	54997	61832	68076	72788	75864	79172	83575	88203	96406	98689	104453
210	4292	4598	4894	5083	5175	5475	5852	6346	6457	7050	7984	8149	8917	9811
211	4044	4401	4798	5469	5844	6538	7007	7339	7704	8110	9134	9711	9784	10584
212	15503	16095	17045	17697	19032	19840	20866	21506	22105	22347	23491	24582	26802	28381
213	4491	4818	5274	5511	5850	6121	6327	6622	6919	7155	7514	7947	8576	8621
231	120000	127666	132620	137889	144435	152456	160394	171234	177860	192491	207748	218384	229460	237351
232	2919	3096	3430	3826	4666	5070	5430	5725	6385	6973	7844	8103	8732	9401
247	25808	28857	29976	31153	35045	34763	38889	44725	51316	61016	68010	73892	75402	80141
251	20494	20841	21387	21491	22289	22946	23728	24826	25231	26319	26713	29538	29522	29251
264	665	758	1036	1330	1669	1932	2148	2444	2461	2862	3088	3633	4066	4465
280	36069	40274	42894	46190	50083	52194	57144	67355	73235	81029	91649	106391	93763	107031
290	1490	1946	2059	2943	3315	3964	4819	5031	5474	6102	6723	6826	7635	7651
300	9349	10691	12234	14690	15468	16260	19020	21046	22315	23594	29565	28854	32917	36361
303	4159	4487	5051	5562	6293	5659	7754	8778	9581	11828	14463	14789	17223	19961
304	26208	28232	31525	34412	35295	36960	38015	40089	53535	62203	74621	84140	92853	98181
306	489	1040	2204	4307	3997	3683	3241	3673	3599	5039	4998	4851	7936	6911
310	35967	35930	40512	44233	46662	48258	53152	75773	74730	82162	93553	105152	117202	130511
311	83725	97152	114672	118832	136447	147406	179850	179427	193334	188983	213188	205021	231510	244081
312	12360	13099	12917	13759	14751	16792	17594	19317	20055	20942	22335	23448	23993	25311
313	21652	23227	24601	26001	27760	29918	32608	34835	38387	40227	43318	47023	49908	52511
314	5206	5698	6103	6859	7510	8235	9011	9627	10913	12009	13013	13223	14589	16011
315	1964	2343	2946	3592	4186	4813	5232	5781	6508	7270	9042	9738	11543	12511
316	29657	32900	36239	36404	36221	41871	46231	44249	47038	48763	53415	64318	63069	69611
319	7483	9922	12232	8264	9072	9352	10216	11169	11513	12321	13442	14152	16882	16411
324	28098	29209	31376	32529	33797	36057	39163	45080	50971	57947	71908	76144	100485	12111
330	199834	198281	251568	265003	27113	293633	330486	350705	385916	414233	443469	486756	497137	512011
331	41656	38217	46170	50310	50599	54834	58180	61451	63389	68705	75154	78859	82751	87211
335	18702	22851	25804	27657	28934	30315	27731	34918	36372	37062	38054	38517	40610	40111
340	6990	7328	7878	7830	8146	8294	9366	9773	10227	10674	11734	13053	14061	14511
343	9327	9628	9939	11478	11811	12356	13399	14033	14808	15562	16504	17497	17618	18511
350	4912	5690	5942	7162	7429	8153	8998	9662	10079	11354	12409	12923	13403	13411
352	10719	11706	13103	14020	13985	15087	16299	17510	19459	20992	26099	25350	29111	27111
353	9009	9577	10454	11037	12119	12834	13753	14820	15737	17701	19474	21106	27848	22111
356	9725	10356	11636	13160	14285	14878	16002	17223	19599	21328	24980	25767	29919	31111
360	27994	32952	33936	35029	37332	38709	40613	42674	45092	48748	48868	54716	54535	56111
361	10505	10712	11497	11488	12161	12514	13783	15076	16326	17591	19483	20187	21841	23111
363	6602	10058	9856	10245	10565	10605	11247	11689	12585	13013	15196	15212	16557	17111
364	6395	7075	7808	8720	9022	9880	11392	12233	11996	15433	17303	19222	19766	22111
372	9922	10195	9982	9759	9782	10205	11557	12114	12698	13601	14482	15359	16164	16111
374	39010	42016	45722	48125	50248	54011	59714	63451	69799	77208	81603	88770	99790	108111

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