Study of Indian Industrial Growth

I. Introduction

There are certain apparent characteristics in Indian industrial growth that should be explored if the growth that has occurred is to be understood, and if policy aiming at future growth is to achieve the goals that are desired.

1) Growth has occurred in Indian industry both in the public and private sector over the past hundred years, and especially within the period since the war. The index of industrial production rose by forty per cent between 1946 and 1954, and with that there has been some expansion in industrial capacity.

2) In spite of this absolute growth, Indian industry in the twenty years from 1931-1951 has neither maintained its relative position as an employer of labor, nor as a contributor to national income.

3) In spite of a planned expansion of industry and a projected increase in the demand for industrial products during the postwar period, over half of the modern Indian industries (by number, not size) had been operating at less than 60 per cent of capacity in 1953 and in the previous years. Capacity is meanwhile increasing, in many of the same industries, at a rate faster than output. This low relation of output to capacity is especially notable in the producer goods industry.

4) In the Five-Year plans, actual investment in modern industry is lagging significantly behind projected investment.

5) As a contributor to national income, factory industry is still only of the same relative importance as small industry (including cottage industry), and employs only about one-fourth as many workers.

The purpose of this study is three-fold: (1) to measure the actual growth that has occurred within Indian industry; (2) to explore the sources of investment funds for the growth that did occur; and (3) to explore the relationships between various measurable variables which might provide insights into the past pattern of growth, as well as suggestions for future policy to achieve a desired future pattern of growth. The major variables to be examined are the growth in fixed assets and capacity, changes in profits, price movements within modern industry, factor proportions and cost, and foreign trade.

This is to be an aggregative study of Indian industry, and it will not attempt the detailed specific industry analysis that Eddison did in his study of the paper industry; nor will it attempt the qualitative institutional approach of Brimmer's study of the managing agency system. It is hoped that it will come up with hypotheses which future individual industry studies might want to explore, as well as indicate problems which cannot be answered quantitatively, and which would need qualitative answers.

The major source of material on industry for this study are the annual balance sheets and income statements, going back to the 1930's, of the public corporations within modern large-scale Indian factory industries. This will be supplemented by data from such sources as the Census of Manufactures, foreign trade reports, the Sample Survey of Manufactures, various local and industry sample surveys and studies, the

published material and it is hoped, raw data of the Tax Enquiry Com-
mission and National Income Committee. (The latter studies will
be especially valuable for data on small factory industry and cottage
industries.)

II. The Study

A. Measure of Growth of Industry (Growth of Fixed Assets)

The primary measure of growth will be the increase in fixed
assets, in financial terms, in the industries for which data exist, over
time. This will be combined with figures for the change in physical
capacity and output in those industries over the same period covered
by the financial data. This will provide both measures of absolute
growth of industry, and of relative growth between industries.

The balance sheet analysis will give us data on the change
in assets over time in the public limited corporation area, which is
the main sector of Indian factory industry. For the private company
it will probably be necessary to make estimates from the various other
mentioned sources, by computing a relationship between the size of
public and private companies.

After some consideration it was decided to use gross fixed
assets as a measure of the size of industry. This is defined to equal
the cumulative total of cash expenditures for new construction, land
and equipment, together with the gross book values of the fixed assets
of acquired firms, minus the gross book values of properties sold or
scrapped. This measure is preferred over net assets as a measure of
size for several reasons. It bypasses the extremely complex problem

of depreciating the original values of fixed assets, with the many questions of methods of depreciation and comparability of methods both between firms and industries, and within a single firm over time. The total of gross assets also includes the values of the many plants which are fully depreciated, but which are not scrapped and which do contribute to capacity and output. If time and data permit, it would be desirable to make net estimates but this would be unnecessary for this purpose.

In such an aggregative balance sheet approach over time several major problems are obvious.

1) The pricing problem is important if a measure of real change is desired. Increasing prices over time would show monetary growth in fixed assets without any real growth. At the same time increasing productivity of newer machines bought for the same price as machines being replaced should ideally be allowed for in estimating gross asset value. Data for both of these over time are either very spotty or lacking. If a price rise is known to be slow, it can be assumed, purely for convenience, that this equals the changing pro-ductivity of equipment. If, however, as happened in India, there was a rapid price rise, it would be important to develop indices of price or cost change for fixed assets. (Possible methods might be to use machinery import prices, construction costs and wages, some Indian price series.) Productivity indices are far more difficult, and it may be necessary either to ignore this factor, (as in all studies in the United States), or to make a very rough assumption of the rate of change.

2) There are various accounting problems in measuring gross assets.

a) Write-ups or write-down of assets would, unless noted, distort the results. In the United States steel industry, several firms squeezed out water from the original book value of their assets by writing them down. Without any correction the time series for the book value of plant would have been nearly horizontal at the same time that the physical equipment was growing.

b) Changes in asset value may be concealed by various accounting devices. Asset growth may be concealed within such current accounts as maintenance and repair, while the balance sheet remains unchanged. This should ideally be corrected for, if the results are to approach accuracy. (In India where so much repair and capital construction is done within the consuming plant this may be significant).

c) Gross Asset Figures include data concerning corporate combinations. Ideally past records of acquired companies, as well as of the purchasing company, should be examined to insure that the measures of fixed assets are comparable for the new and old companies. This may be impossible because of data gaps.

B. Sources of Financing

1) From the liability side of the balance sheet it is possible to derive, by industry, estimates of external financing — share capital, long-term and short-term debt; and internal financing — depreciation reserves corrected for scrap proceeds, and surplus. From this it would be possible to relate both the relative importance of new and internal sources of capital and the type of financing to industrial growth. These estimates will be, and should be, in current prices since

we are interested in financing in a given year. As on the asset side certain accounting problems arise. The most important of these is the elimination of changes in the liability accounts which arise from either inter-account transfers or changes other than financial contributions. Examples of the former are shifts from the depreciation reserves to surplus, and of the latter are by recapitalizations, or stock dividends.

C. Income Statement

The current income statements will permit estimates of changes in revenue and, even more important, changes in profits, profit/capital ratios, and dividend/profit ratios over time. It would be expected that the profit ratio changes would be major determinants of investment decisions by the firm and within an industry. Combined with balance sheet data permitting comparison of growth between industries, and examination of the entrance of new capital into an industry (distinguished if possible between new firms, and expansion by existing firms) significant conclusions with respect to entrepreneurial behavior and ease of entry into an industry may be reached. The balance sheet analysis will also make it possible to explore the role of mergers in Indian industry, while current income statements of the merged firms would indicate reasons.

D. Price Analysis

While the bulk of the time will be devoted to balance sheet analysis, it is obvious that an industry's output, rate of profit and possible rate of investment will also depend upon the prices charged for the industry's products. If price data over time are available, it would be desirable to present various price series for the products of the Indian industries covered, and relate these price movements to changes in output, profits, investment and capacity.

E. Factor Proportions Analysis

By combining factors of production in certain proportions firms produce the same output at different costs, and consequently with different rates of profit.

1. Aggregative Analysis

Within India, in any one industry, there are probably wide variations in capital/labor combinations. It is hoped, within any one industry, to find a bi-modal distribution of firms producing the same type of product. By using the balance sheet and current income statements, it should be possible to compute the labor input and capital input (depreciation allowance plus imputed interest or rent) per unit of output.

If comparison is possible, it should be possible to relate these differences in factor proportions to other quantitative measures — profits, sales and investment — and to present certain hypotheses with respect to relative efficiency of operation and relative rate of growth between these two groups of firms. If the cost data for the two sectors are available and the cost differences are related to the price charged by the industry for its product, this relationship of costs and prices would be of significance in explaining the present position of the industry, differential rates of growth within the industry, and the existence of unused capacity. It would also be of great interest to see if differences in factor proportions which existed at the start of the period still exist, or are disappearing during the last twenty years.

2. Individual Plant Studies

If time permits it would be desirable to compare individual plants which produce with sharply varying labor/capital input combinations.

This would use the detailed process analysis method presented by
Eckaus and would attempt to get man-hour inputs of labor and capital
per unit of the same output over the same time by different methods.
Since the results from this method are not distorted by excess capacity,
it would give a better measure of actual capital or labor input per unit
of product than the aggregative method.

     3. Comparison of "Modern" Plants with Small Factories
       and Cottage Industries

     From individual industry studies, sample surveys, etc.
it may be possible to comput labor/capital proportions in small factories
and in cottage industries. A comparison of such results with the results
in the modern sector of the economy should make it possible to compare
efficiencies and employment potential in these sectors, and would be
useful in estimating the future possibilities and competitive positions
of these sectors.

  F. Foreign Trade and Industrial Growth

     Import quantity and price data may be readily available for
various industries. This would make possible a comparision of prices
of and shares of market taken by imports or domestically produced goods.
The relationship between these prices, tariff rates, profits, sales and
capacity may be important in explaining both the growth of certain
Indian industries and the existence of unused capacity in those industries.
Imports at lower prices may contribute to Indian unused capacity; also
the imposition of tariffs may have created certain Indian industries,
but with higher prices or poorer quality the total demand after the
tariff may be less than either the previous total demand for foreign

imports, or than the potential output of the Indian industry at the required scale of plant.

On the export side the changes in exports for Indian products should indicate the role this has played in industrial expansion.

G. General Context

It would be important to relate the changes in investment within the general qualitative context of Indian economic development. This section would utilize other studies to provide the basic background material, and would relate factors external to an industry but impinging upon it to help explain its growth. Examples of such factors are: the Indian business cycle; various major exogenous events such as wars, famines, independence and partition; government policy with respect to industry such as the Five-Year Plan; sharp changes in tax and tariff policies; changes in foreign markets or foreign suppliers.

This section would also attempt to discuss certain qualitative factors — such as entrepreneurship within an industry (the role of the managing agent, English or Indian, large or small, technically progressive or traditional, etc.), and the effect of this upon investment.

It may also be possible, from the rural section of this study to get information on rural consumption patterns, and the relationship of changes in the rural economy to the changes in modern industry.

III. Conclusions

This paper, though it may superficially appear to cover a vast range of topics, seeks to center about two major problems: (1) what has measurably happened in Indian industry; and (2) from examination

of certain major measurable economic variables that effect the behavior

of an industry -- profit rates, sales and income, prices, costs and

foreign trade -- why has this happened? The material for this study

should be available from promised balance sheets and income statements,

and various available government reports or industry studies.

From analysis of the data it should be possible to come up with

tentative answers to the questions raised, as well as hypotheses which

can be further tested or discarded by individual industry studies or

by studies of those many factors in economic growth which do not lend

themselves to quantitative analysis. By providing even tentative ans-

wers to the reason for the growth that has occurred this study may

influence policy-makers toward policies which would accelerate the total

rate of growth and influence the direction.