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TOTAL-FACTOR PRODUCTIVITY AND EFFICIENCY BY SIZE-CLASS OF MANUFACTURING ENTERPRISES

WORKING PAPER NO. 3

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TOTAL-FACTOR PRODUCTIVITY AND EFFICIENCY BY SIZE-CLASS OF MANUFACTURING ENTERPRISES

1. Introduction

The Purpose

This working paper is devoted to measuring and analyzing year-to-year total factor productivities (TFPs) in Bangladesh's manufacturing industries by size-class of establishments. The primary purpose of calculating TFPs (and other indices of performance) is to analyze them in relation to changing industrial and other policies. Time-series estimates of net incidences of about 3 dozen policies/incentives are being calculated for the years 1974-75 through 1987-88 and will be presented in due course. Apart from their analysis to gauge the impact of policies on growth, however, productivity measures are useful by themselves. The present paper is addressed to the latter purpose.

The Sample

The sample consists of a merge file of annual CMIs, comprising of the data for the following years: 1973-74, 1974-75, 1975-76, 1979-80, 1980-81, 1981-82, 1982-83, and 1983-84. Three files were made: (1) all those enterprises which completed questionnaires for each year of the reference period, denoted

here as "old enterprises," (2) the sample of new enterprises which filled questionnaires for the first time during 1975-76--1983-84 and continued doing so once entered, denoted as "new enterprises," and (3) the sample of enterprises which exited the industry after 1974-75 and did not reappear, labelled as "moribund enterprises." The distributions of units and workers over different years of the reference period for each of the samples are given in Table 3.1. It may be seen that the "old" establishments form the largest group and "moribund" units the smallest. Simply blown up to the original sizes, "old" establishment sample of 760 units provided employment to 370 thousand workers or 2/3rds of total manufacturing workforce in 1983-84; the "new" establishment sample of 1995 units to 138 thousand workers in 1983-84: while the 541 establishments which existed in 1974-75 but exited by the year 1983-84 accounted for 46 thousand workers in 1974-75. Since our main purpose in this working paper is with total-factor productivity growth, the first year establishments of the "new" and "moribund" samples and the last year establishments of all the three samples drop out. For this and other reasons, the final sizes of the three samples are "old" 373 units, "new" = 1067 units, and "moribund" = 136 units.

The purpose of subdividing the census into three parts or three samples is as follows: The sample of old firms was selected to reduce errors of measurement and maintain consistency, as it is alleged that some firms do not complete the questionnaire every year, but do so at their will, thus becoming dead in one year and new in another. Old enterprises are a class

of their own, at least more homogeneous in their response to cooperate in the census enumeration. One should also expect more consistency in their reporting the values of different variables year after year. The sample of new enterprises was selected with a view to studying productivity and technical change embodied in new vintages. The third sample was separated to study the death function of enterprises. In the end, all the three samples will be combined to study the effects of entry and exit on the productivity of enterprises that continue in production as well as the productivity of the overall sector.

The next section describes the cleaning-up that we have done in the CMI raw data to prepare the merge file from 1973-74 through 1983-84. In Section 3, we derive the total-factor-productivity (TFP) and other efficiency-measuring relations. Section 4 presents the measures of TFP, separately for old, new, moribund, and overall manufacturing establishments. In Section 5, we explore the impact, if any, of the New Industrial Policy 1982 (NIP82) on the overall manufacturing sector. Differential impacts of policies on small and large enterprises are investigated in Section 6. The next section is devoted to an analysis of inter-size-class mobility of enterprises over time. Factor intensities are analyzed in Section 8. The final section summarizes the conclusions of the TFP analysis. For the benefit of future researchers, in Appendix A we give the documentation of the variable records in the CMI Merge File.

2. The Cleaning-up of CMIs

The next task undertaken in this study was cleaning-up of

errors in the CMI. Among the main corrections made are the following:

(1) The initial old-enterprise sample of 670 units was listed by names of the product and three major raw materials of each establishment. An inspection of the printout of products and raw materials over the ten years: the reference period revealed inconsistent entries for 290 of these enterprises, for example cotton yarn is given as the major raw material of ice product in one year and that of frozen fish in another year, linseed is the major raw material of frozen fish, and the like. The enterprises with this kind of enumeration-or-data-entry errors were omitted. A few other establishments had to be dropped because of suspicious cost to output ratios. The remainder "old" establishment sample, analyzed here, consists of 373 units.

Similar cleaning-up of the "new" establishment sample led to the reduction of the original sample of 1995 establishments to 1615 units and that of 541 "moribund" establishments to 531 units. Certain further reduction in the establishments of these samples become necessary which will be explained later on.

(2) It was found that capital stock was invariably understated. In the old sample, the mean capital-output ratio was found to be .2958, .3013, .2185, .1990, .1917, .2069, .2042, respectively for the years 1974-75, 1975-76, 1979-80, 1980-81, 1981-82, 1982-83, and 1983-84. One of the reasons for this is the well-known practice of accountants to prepare their balance sheets in which capital assets are measured net of depreciation. This practice is prevalent irrespective of which depreciation

formula has been applied and whether or not accelerated depreciation allowances have been availed of. The measures may have little relationship with true depreciation. A second mismeasure (almost always an understatement) of capital arises from accountants' practice of cumulating (artificially depreciated) assets in the initial-year prices, thus obtaining a hodge-podge aggregation of different-year assets in different-year prices. Especially during inflationary periods and high accelerated depreciation allowances rising to 80 percent in the very first year, the accountants' practice alone can reduce capital assets to insignificance. Finally, misreporting capital assets and net worth may be deliberate to avoid taxes and other legal constraints. There are other complex problems involved in the measurement of capital, into which we need not go here.

According to knowledgeable national experts, the mean capital-output ratio in the manufacturing sector is close to 2. Accordingly, the capital stock of each enterprise of the "old" sample was adjusted upwards by a correction factor that yields a mean capital-output ratio of all enterprises of 2. No adjustment was made to the capital of the "new" sample. The precise adjustment procedure is described in the definitions of variables in Appendix 3A.

(3) A number of other checks and cross-checks were made. For instance, the wage rates calculated from the wage bills recorded in the master tapes for each year and each chosen enterprise were compared against the wage rates given in alternative sources, specifically those given in World Bank

(1988, Tables 9.7 and 9.8). It was found that about 90 percent of enterprise wage rates fall between 100 percent plus or minus of the mean wage rates reported in the cited source. The wage rates were, thus, considered to have passed the plausibility test. Likewise, in only 1.5 percent of the 393 enterprises over the entire period, the ratios of wage bill to the value of output (W/Q) exceeded 40 percent and in only 7.5 percent fell below 3.5 percent. This result was also found satisfactory, because most values fall in the plausible range of 3.5% to 50.0% Insofar as the outlying values go, it may be mentioned that even in the TIP study in which the cost structure was developed by factory visits, several W/Q ratios were below 3.5. For instance, for the M.S. Rods (basic steel) industry, in all the three alternative processes of production, the labor cost comes to 2.9 percent of the value of output (TIP Reform, Report on Basic Steel (M.S. Billet, Plate, Rods, and C.I. Sheets) Industry, by R.W. Walker, DOC. TIP-EPS-A.1, Rev., Aug. 18, 1985, Tables C8, C9, and C10). As such, the outlying enterprises were not dropped, lest the sample should lose its variability and lest the step should be interpreted to amount to tampering with data. In other words, only those obervations were dropped which were obviously wrong, such as, those using yarn to produce ice. Interestingly, most of the enterprises with suspiciously low W/Q ratios are in garment industry.

(4) Yet another type of correction was made by dropping out those enterprises for which the indices of total factor productivity of the intervening years were suspiciously large, e.g., those exceeding the values of 200 percent within a single

year.

Concerning the values of the indices of total factor productivity in the manufacturing establishments of Bangladesh, however, large deviations from unity, e.g., values between 0.5 and 1.5, should not be considered necessarily implausible.

Total-factor and single-factor productivity is a catchall concept which picks up the effects of various factors, such as economies of scale: increase in capacity utilization; enhancement of labor skill; improvement of labor relations; technical change, i.e., the total-factor productivity growth proper; and so forth. Large year-to-year changes of productivity growth are expected for Bangladesh enterprises during the reference period because of inordinate changes in capacity utilization due to fluctuating raw material and marketing conditions resulting, in turn, from recurrent natural disasters, frequent political upheaveals, major policy changes, and so forth. (For an analysis of the sources of technical change, see Sahota (1968), especially Appendix C.) The higher the aggregation level, the more these fluctuations will be averaged out (reduced).

The CMI is done annually and is designed to survey all establishments employing 10 workers or more. Due to the ups and downs of establishments, however, some below-10-worker units are also picked up. Their number is very small, only 0.3 of 1%. The sample size is 8.3% for 10-19-worker establishments. It rises steadily to 45.4% for establishments with 100 workers or more. In view of this, the results about Size-Classes < 10 and 10-19 workers should be interpreted cautiously.

A final caveat that should be mentioned before discussing the empirical results pertain to the magnitudes of productivity indices. The main interest of this exercise is to see if there are any variations in productivity. For, in view of various factors that can cause productivity differences, as well as possible errors in data that might still remain, directions of change and relative magnitudes are of particular interest rather than precise, absolute magnitudes. For the primary purpose of the present calculations, as stated in the opening sentence, is to test their correlation with policies, with or without lags.

3. Derivation of Total-Factor Productivity Index

The rate of growth of total-factor productivity by enterprise and 4-digit manufacturing industry is measured without imposing any specification on the underlying production function. Let the implicit production function be written as

$$Q = A(t)f(X_i) \qquad (1)$$

where $A(t)$ is a measure of productivity in year t and X_i are inputs.

Assuming constant returns to scale and competitive factor markets, and letting the price of output be unity, such that the value marginal products equal the respective input prices, then by Euler's theorem, (1) may be expressed as

$$Q_t = A(t) \sum_i \frac{\partial f}{\partial X} X_{it} = \sum \frac{\partial Q}{\partial X_i} X_{it}$$

$$= \sum_i w_{it} X_{it} \qquad (2)$$

where w_i is the ith input's wage rate (price).

Further suppose that inputs in year t are assigned marginal products of year t-1, then for year t (2) can be written as

$$Q_t = A(t) \sum_i w_{i\,t-1} X_{it} \qquad (3)$$

In this equation, the summation term indicates the level of output that would have prevailed had there been no productivity growth from year t-1 to year t, leaving the productivity-growth term A(t) as the repository of all output effects that are not due to constant-efficiency physical inputs.

We might pause at this point a bit to list those factors that might explain A(t) in the context of Bangladesh and the sample being used. The sample, it may be recalled, consists of base-year enterprises, which have most probably continued using the same plants as in the base year, 1974-75, but in which some BMR work and plant expansion might have taken place over the years.

It may be noted that $A(t) = 1$ means no productivity growth. The factors that can cause $A(t)$ to be greater than or less than one include, among others, the following factors: fluctuations in capacity-utilization (which could, in turn, be due to ups and downs in foreign or domestic demand); scale economics; non-competitive factor markets; changes in the quality and the efficiency of the use of raw materials (especially when the input set employed consists only of primary inputs, as is the case in the present study); fluctuations in the timely availability of raw materials; changes in the qualities of primary factors (e.g., the skill and education of workers); changes in the intensity of the work process, e.g., manhours worked per manyear (resulting, for instance, from days lost due to <u>hartals</u>); availability of new processes for the same product and machinery; introduction of new technology through plant expansion, BMR work, or extension by new vintages of machines; improvement in the organization of work and production due to experience; deterioration of productivity due to machines becoming old and subject to frequent break-downs; the most important of all, changes in policies; and similar factors.

Writing (2) for period t-1, dividing it into (3), and solving for A, we obtain

$$\frac{A(t)}{A(t-1)} = \frac{Q_t}{Q_{t-1}} \left(\frac{\sum_i w_{i,t-1} X_{i,t-1}}{\sum_i w_{i,t-1} X_{it}} \right), \qquad (4)$$

which is the output-per-unit-of-input or total-factor-productivity index.

Writing revolving, year-to-year or period-to-period changes by more compact notation of subscripts of the form A_{10} for $\frac{A(t)}{A(t-1)}$, Q_1/Q_o for Q_t/Q_{t-1}, etc., Relation (4) can be written as

$$A_{10} = \frac{Q_1}{Q_o} \left(\frac{\sum_i w_{i0} X_{i0}}{\sum_i w_{i0} X_{i1}} \right) \tag{5}$$

Expanded to the actual inputs used in this study, where only primary factors appear as X's (implying the assumption of fixed ratio of raw matrials to output), and where, by way of illustration, subscripts 0 and 1 have been stated in terms of 75 and 76 (standing for 1974-75 nd 1975-76, respectively), Relation (5) becomes (5').

$$A_{76,75} = \frac{Q_{76}}{Q_{75}} \left[\frac{NW_{75} + W_{75}}{(r_{75})(K'_{76}) + ({}_1w_{75})({}_1N_{76}) + ({}_2w_{75})({}_2N_{76}) + ({}_3w_{75})({}_3N_{76}) + \frac{}{({}_4w_{75})({}_4N_{76}) + ({}_5w_{75})({}_5N_{76})}} \right] \tag{5'}$$

where Q's are deflated by the respective price indices. For definitions of variables, see Appendix 3A.

4. Total Factor Productivities

Empirical Results

Summaries of the calculated year-to-year and cumulated total-factor productivities (TFPs) of "old", "new", and "moribund" enterprises are presented in Table 3.2 through 3.7. Detailed estimates are given in Table 3.A1, 3.A2, and 3.A3.

4.1. The "old-enterprise sample of the CMI

a. Establishment-level analysis

Of the 390 enterprises, 156 have experienced positive cumulated total factor productivity (TFP) growth rates cumulated over the 9-year reference period, while 234 have undergone declining TFPs. Interestingly, both negative and positive TFP-growth establishments are found in the same industries, jute fabrics, cotton fabrics, yarn, tea, and so forth. No industry as such is wholly sick or wholly dynamic, insofar as old establishments are concerned. A possible inference from these findings is that individual entrepreneurs rather than industries make major difference.

A majority of large (200-&-over-worker) establishments have experienced positive TFP growth rates, while majorities in all lower size-classes of establishments indicate declining TFPs. Among all these size-classes, the lowest size-class, namely the one consisting of less-than 20-worker establishments, has done better with almost 50-50 division between increasing and

declining TFPs. As a matter of fact, in terms of the percentage of establishments of each size-class of Table 3.2 that have attained cumulated TFP growth rates exceeding 100%, the less-than-20-worker establishments with 16% of such units rank at the top and 200-and-over-worker establishments with 14% of such units rank second from top (Line 11). The bottom rank goes to the 50-99-worker class with only 4% of establishments in this group (see the penultimate line of Table 3.2). More or less same ranking persists for the higher-than-unit index of cumulated TFP (see Table 3.2, last row and Fig. 3.1). By comparing Fig. 3.4a and Fig. 3.4b, one can see that some small establishments are doing exceptionally well (those in Fig. 3.4b) and others (though in the same industry) are doing very poorly. The clue to this dichotomy is probably to be found in management and similar factors. To this verification, we shall return in a subsequent chapter.

Among small establishments, the noted result seems, in part, to have been achieved through employment rationalization. Thus 81 of the less-than-20-worker establishments underwent negative changes in employment between 1975-76 and 1983-84 as against mere 12 with increases in employment. The bulk of the expansion in employment has come from the upper size-class in which the corresponding ratio is 32:77, as may be seen from Table 3.3 and Fig. 3.2.

The gap between shares of establishments with negative changes in N (larger share) and those with positive changes in N (smaller share), however, narrows down when we move from low TFP indices to higher TFP indices, as may be seen from Table 3.4 and Fig. 3.2. The expansion in persons engaged has come mostly from

large establishments, in which employment has increased across all levels of TFP indices (see the right ends of the 7 graphs of Fig.3.2).

Naturally, the deterioration in value added per worker (VA/N) in the negative TFP (.99) establishments relative to the establishments in the TFP 1.00 range is a reflection of low economic performance (see Table 3.4 and Fig. 3.3). Across all values of TFP, the correlation between VA/N and TFP seems to be positive. No such correlation is discernible for VA/Q. The curve shows a deterioration of VA/Q from TFP = 1 upward and a shallow U shape below that cut-off point of TFP (see Fig. 3.3). We shall investigate these relations further in relation to the other samples of establishments below.

In summary, a result that should be underscored for reference in succeeding sections/chapters is that in terms of TFP, almost half of the small (less-than-20-worker), old establishments have done almost just as well as the best among other size-classes (the largest size-class, to be specific). The relatively better performance in TFP by small-size "old" establishments has not, however, been accompanied by commensurate increase in employment, which is the lowest among other size-classes. For possible explanation of why some have done impressively well in the same size-class and the same industry and others so poorly and why productivity growth does not appear to be correlated with employment expansion, we shall have to wait till the stochastic analysis in a subsequent section.

b. Industry-level analysis

Out of the 72 industries of Table 3.5, only 23 have cumulated productivity growth index greater than one. Prominent among these may be mentioned: sawing wood, refined soybean, allopathic medicines, nails, miscellaneous electric products, trunks and suitcases, machinery and equipment, fountain pens, umbrellas and sticks, textile machinery, woollen textiles, plastic products, iron and steel rods, sewing machines, agricultural machinery equipment, and other medicines.

Much has been written about the movement of wage rates. The present results indicate that between 1975-76 and 1983-84, operative wage rates increased in 41 and declined in 31 of the 72 industries, though, given measurement errors, the changes are probably not significant. Among the possible reasons for the suggested absence of uniformity of changes in wage rates are the simultaneous existence of public corporations and private establishmnts, some establishments operating with old, others with new machines, differences in the degree of unionization, and possible segmentation between formal and informal sectors. These conjectures will be explored in the econometric analysis.

In over 80 percent of establishments, the wage rates of administrative personnel exceed those of operatives by a multiple of 1.8 to 2.3. The worker category "others" includes all types of workers, from working proprietors to family workers. As such their wage rates show no pattern of deviation from the wage rates of the other two categories reported in Table 3.5.

Judging from the like signs between TFP>1, N, w of

operatives, VA/N, and VA/Q, little correlation is discernible between TFP and N, TFP and w, and w and VA/Q. Positive correlation is suggested between TFP and VA/N, TFP and VA/Q, VA/Q and VA/N, and w and VA/N. Negative correlation is suggested between N and w, as expected.

Wage rates of the three categories of persons engaged seem to change in the same direction in most of the industries, also as expected. The correlations, as judged by inspection, however, are not high, and none of these results are surprising.

The variations of changes in VA/Q between 1975-76 and 1983-84 are mixed: 34 establishments have experienced improvement in this ratio, 25 deterioration, while 13 have experienced no change. Value added per worker (VA/N) has gone up in two thirds of establishments. The improvement has occurred, as expected, in a relatively larger proportion of establishments with increased TFP than those with reduced TFP. The observed variations would prove fructificative in the econometric analysis in a subsequent working paper.

A few multivariate associations may also be noted. Among the 4 industries with positive TFP growth and negative change in VA/N, two consist predominantly of small establishments with less than 30 workers, namely sawing wood and fabricated metals, thereby yielding no clear-cut pattern and two large establishments, namely non-metallic minerals and basic metals. In all the 4 industries with positive TFP and negative VA/N, the VA/Q ratio, too, is negative. Understandably, positive changes in VA/N are almost perfectly associated with positive changes in VA/Q.

A broad conclusion of these findings, particularly those relating to VA/Q, is that the efficiency of raw material usage is possibly a major factor determining productivity, which, in turn, most probably reflects fluctuations in capacity utilization, raw material quality and cost, or over-invoicing of raw material costs (thus deflating VA) when productivity goes up.

It should be noted that the 393 "old" enterprises in aggregate stood pat over the reference period. Thus, the deflated values of Q, VA, and N, respectively, stood at Tk. 6.73 billion, Tk. 3.16 billion and 152,501 workers in 1975-76 and Tk. 6.94 billion, Tk. 2.52 billion, and 181,743 workers in 1983-84. Output hardly changed over the 8-year period. Value added declined in absolute terms. In constant 1975-76 prices, value added per worker declined from Taka 19,335 to Taka 15,370. While within this sample, some firms experienced positive TFP, others negative, as a group, naturally they seem to be losing in competition with new entrants, which are likely to employ more modern technology. As a group, thus, they are probably on the losing end of the overall industry, even though they comprise of some of the biggest firms of the country. It may also be recalled that, despite gradual relaxation of restrictions on the size of privately owned firms since the late 1970s, it was really not until 1982 that private firms were permitted to expand. During the earlier years (the longer part of the reference period), expansion took the form largely of the multiplication of firms rather than the augmentation of capacity of existing firms. With this note, therefore, we turn to the new enterprise sample.

4.2. The New-Enterprise Sample of the CMI

The new-enterprise sample, i.e., that of the establishments which did not exist prior to year 1975-76 consists of 1,995 establishments. The editing of it led to our dropping of 328 units due to suspected errors or incompatible raw materials and products, or similar inconsistencies and 55 due to unacceptable raw-material cost or other related ratios. For the TFP estimates, furthermore, 232 additional enterprises had to be dropped, as they entered during the last (1983-84) year of the sample, for which, therefore, data do not permit year-to-year measures of TFP. A further set of 213 units were omitted due to unexplainable errors indicated by inordinately big jumps in TFP indices. The resulting size of the "New Establishment" sample thus, consists of 1067 units.

We do not anticipate as severe a measurement problem in the capital variable in the present sample as was encountered for the old-enterprise sample, because the capital stock reported in the initial year of production is free, at least, of the accounting and depreciation errors to which old establishments are subject (see the earlier discussion for old enterprises). We use gross capital stock in this sample. More precisely, we ignore any reduction in capital stock. On the other hand, where the reported capital stock in a year subsequent to the initial year of production was higher than in the previous year, that was considered to be due to new investment, and the new value was used. For a more precise description of K, see Appendix C. A justification for this procedure is that the service efficiency

of a new machine is unlikely to deteriorate in the first 5 to 10 years. Hence, any depreciation is artificial, and serves only accounting and tax purposes. The effects of obsolescence, if any, will show up in the TFP measures. On the other hand, insofar as accounting depreciation is concerned, the 1951 Bawa Jute Mill, which is still fully operative, must have been fully depreciated long ago. Yet its K is not zero. Unfortunately, the reported capital/output ratio of 0.3 for "new" enterprises, too, is unbelievably low, even though it is higher than 0.2 for "old" units.

The first year estimates of TFP for this sample are to be ignored (even though they are reported in the tables), as the base year data for output and other variables may not be for full year. Production may not begin on the 1st of July of the initial financial year. All the data and the estimates at the establishment level are, however, saved on the electronic tape for record. Micro data on tapes will be employed for econometric analysis. Only aggregate data at the 4-digit-industry level are reported in the tables of this study.

A Comparison of TFPs of
old and new establishments.

The U-shape persists.--Comparisons of TFPs of "old" and "new" establishments may be made from their measures given in Tables 3.2 and 3.6. Summarized results are also sketched in Fig. 3.4a, 3.4b, and 3.4c. It may be seen that the measures for 1983-84 and those cumulated over the entire reference period indicate a clear U-shaped curve of TFP gains as the size of establishment

increases. The pattern persists for all samples and under alternative measures: (a) no matter which cut-off point of the TFP>1 range is taken (compare Figs. 3.4a and 3.4b), (b) whether the TFP indices are compared for the terminal year, 1983-84, or those cumulated over the entire period; (c) whether it is the "old" sample or the "new" (compare the two curves of each of the 3 figures, 3.4a, 3.4b, and 3.4c). The highest TFP growth rates are found for large establishments with upwards of 199 employees; the second high rank goes to small establishments with 19 employees or fewer. The TFP indices of the "new" sample for 1983-84 are clearly higher across all size-classes of establishments than those of the "old" sample, indicating a vintage effect and probably a disparate NIP82 effect. We will go into this issue in greater depth a few sections below.

The U shape tilts.--Another feature that should be pointed out is the unequal steepness of the two sides of the U as between the "old" and the "new" samples of establishments in the cumulated TFP measures. Thus, while the U shape of the curve of the distribution of establishments with cumulated TFP>1.50 as well as TFP>1.00 remains robust in the two samples, the new-establishment curve for the cumulated measure tilts anti-clockwise by an angle of roughly 20 degrees with fulcrum between the size-classes 20-49 and 50-99 workers and with the bottom tending to shift from the 50-99-worker size-class toward the 20-49 size-class, as may be seen in Figs. 3.4a and 3.4b. That is to say, a higher percentage of high productivity-growth establishments is large-sized and correspondingly a lower percentage of high-productivity-growth establishments happen to be

small in size in the "new" sample than the "old" sample. Even after the tilt, the small-enterprise (<20-worker) size-class maintains its TFP superiority over medium size-classes. The highest of all productivities, however, prevails in the large (200 and over) size-class. The productivity performances of middle-size enterprises is consistently lower than those of the two end classes. Caution: The results for smaller size-classes of the CMI should not be given undue credence, as the CMI picks up some odd establishments in the below-10-worker size-class. The result that large enterprises have shown higher TFP growth rates than medium ones is somewhat troublesome inasmuch as they seem to be largely responsible for the decline in value added per worker.

The TFP of "new" firms is negatively correlated with changes in employment.--It may also be noted that total factor productivity growth in new establishments is negatively correlated with employment expansion, suggesting that total factor productivity is probably acquired at the cost of labor-saving techniques i.e., by capital-intensive establishments (see the penultimate column of Table 3.6). Somewhat anomalously, similar negative correlation is also observed between cumulated TFP growth rates and the VA/Q ratios (see the last column of Table 3.6 and Fig. 3.4d) suggesting as if raw materials are substituted for labor. It may be recalled (refer back to Table 3.4), that a similar result was found in the old sample for TFP>1. It is an anomaly because this result is seemingly at variance with the VA/Q ratio by size-class of establishments that

will be seen in Table 2.13 below.

A result that may be noted from the comparisons between "old" and "new" establishments is the large wedge between the curves for the "old" and the "new" establishments after the introduction of NIP82 as may be seen from Fig. 3.4c. A similar wedge exists even in the cumulated measures (Figs. 3.4a and 3.4b). Although not much can be said with confidence on the evidence of one year's findings, this result tends to provide some support to effect that newer plants have attained superior TFP growth rates.

The TFP indices for "old," "new," and "moribund" samples are summarized in Table 3.7. Those for the former two are also sketched in Fig. 3.5.

4.3. The "Moribund" Sample of CMI

TFP lower in "moribund" firms, as expected.--As one would expect, the TFP performance is lower in the "moribund" sample in comparison to the other two samples. Thus, of those common industries that appear in all the three samples of Table 3.7, 14 out of 28 (or 50%) have TFP>1 in the "new" sample, 16 out of 29 (or 55%) have TFP>1 in the "old" sample, and only 8 out of 29 (or 28%) have TFP>1 in the "moribund" sample (calculations from Table 3.7).

One death for every five births.--During the decade from 1974-75 through 1983-84, 1995 establishments entered manufacturing, while 451 exited. Thus, roughly, there is a death for every five births of firms. The percentage birth and death rates across size-classes are practically the same with slightly higher birth rate and slightly lower death rate for large

enterprises, as may be seen from the following array of the percentages of entrants and exiters arranged by size-class of workers:

	<10	10-19	20-49	50-99	100&+	Total
Entrants	16	30	34	10	10	100
Exiters	20	27	34	12	7	100

Thus, there is a perceptible, though very weak, evidence for a higher rate of failures among small (<10) as against large (>99) enterprises.

High-and-low TFP industries identified across the 3 subsamples.--It would be of interest to compare the TFP growth rates of the three groups of establishments for 1983-84, the full year after the introduction of the NIP82. (For the "moribund" establishments, we will use cumulated TFPs upto year 1982-83, because they did not survive in 1983-84). It may be seen that out of the 55 industries of Table 3.7 that are common to both "old" and "new" samples, 21 have TFP>1 in both, 10 have TFP<1 in both, while the TFPs of the remaining 24 industries have opposite signs from the unity benchmark for new and old establishments. Among those with higher than unity index of TFP in both samples are the following industries, where the stars indicate TFP>1 in all the three samples:

TFP>1 in both old and new estabs

3204	Silk and synthetic
*3205	Narrow fabrics
*3213	Knitting mills
*3216	Spooling and thread
3519	Industrial chemicals
3525	Match box
3528	Coal tar/alkatra
3712	Iron and steel rod
3719	Iron and steel
3804	Steel/metal almirah
3909	Aluminium wares
3819	Fabricated metals
*3825	Industrial machinery
3829	Machinery and equipment
3846	Bicycles and parts
3937	Fountain pens
3938	Umbrellas and sticks
3949	Brush, all type

It will be seen that most of the high productivity-growth industries of the overall sample fall in two 2-digit industries, namely:

32: textile, wearing apparel, and leather

33: light engineering and metallic industries and related products

Both have done well in export, too (see TIP Report, TIP-EPSU/MU-H-Part I, March, 1987, esp. App.b). Thus, some

innovative or other productivity-increasing processes/management practices appear to be going on in these two industries. For that and other interests, we shall be looking at these two industries in a greater depth subsequently.

The top 10 industries in each of the "old" and "new" samples, ranked from high to low TFP index, are listed below:

"Old"

Industry		TFP
3815	Trunk and suitcaes	3.1763
3816	Nails	2.7818
3824	Textile Machinery	2.6824
3819	Fabricated metals	2.4734
3827	Sewing Machines	2.3151
3202	Woollen textiles	2.1339
3311	Sawing wood	1.8822
3712	Iron and steel rod	1.8455
3829	Machinery and equipment	1.6403
3516	Plastic product	1.5677

"New"

Industry		
3114	Fish and Sea Food	1.91
3118	Grain Milling flour	2.13
3118	Grain Milling flour	2.29
3201	Cotton textile	2.35
3204	Silk and Synth. textile	2.20
3204	Silk and Synth. textile	3.48
3204	Silk and Synth. textile	2.23
3213	Knitting mills	3.48
3521	Paints and varnishes	2.03

In this list, most of the "old" high-TFP establishments belong to light engineering and the textile-garment-leather industries; most of the "new" high - TFP establishments fall in the textile-garment-leather and agro-based industries, and largely correspond to those categorized as dynamic in the reports of the TIP Project.

Despite caveats, the TFP results seem plausible and consistent with comparable studies.--Due to a host of explicit and implicit assistance measures--operating as protection, taxes, subsidies, controls. etc.--in Bangladesh, the calculated TFP indices might not necessarily reflect superior performance in production. At the same time, if the concessions do not vary inordinately from year to year, the indicated distortions are unlikely to cause significant bias in year-to-year TFP indices. As we have just seen, comparisons between top TFP-achievers in both old and new samples and the industries categorized as dynamic in the TIP Project indicate that good many of them match. Thus, despite the fact that the highly disaggregated TIP products, e.g., yarn of count 20, 40, 60, etc. do not necessarily correspond to the products/enterprises of this study, and despite the criteria of efficiency of the two studies being somewhat different: export attainment in the TIP Project and TFP performance in this study--the results of our study are not consistent with those of the TIP project.

Some puzzling cases.--Somewhat puzzling are the cases in which the 1983-84 indices of TFP in new establishments are lower than one while those in "old" ones are higher than one. Major industries in these categories, along with the ones with the reverse deviations, are noted below:

TFP Growth Rates with Opposite Signs in "old" and "new" Establishments for 1983-84

Group I: "new">1 "old"<1		Group II: "new"<1 "old">1	
3116	Edible oils	3231	Tanning and finishing
3118	Grain milling	3311	Saw and planning mills
3144	Tobacco stem	3411	Pulp and paper
3201	Cotton textiles	3413	Articles of pulp paper
3515	Pesticides	3501	Allopathic medicines
3523	Soap and detergents	3503	Ayurvedic medicines
3691	Brick, tiles and clay	3516	Resins, plastic materials
3815	Metal trunks	3816	Bolts and nuts
3817	Plumbing equipment	3822	Ag. machinery & equipment

Roughly, the relatively large, well-established, heavy-to-intermediate-good-producing industries fall in Group II and relatively small-scale, light, consumer-to-intermediate-good industries fall in Group I.

4.4. The overall census

The calculations of TFP for overall industries (old + new + moribund) are summarized in Table 3.8a, where the corresponding series of TFPs for old and new samples are also given by way of further comparisons. We expect a higher TFP performance in the overall sample than the old sample relative to the earlier-noted wedge between the TFPs of new and old establishments. Our expectations are based on the possible prevalence of a variant of putty-clay-investment model, due to which new firms enjoy a one-

shot cost-saving advantage over old firms in the first year, which is not captured in the year-to-year TFP growth rates of subsequent years. If this supposition were correct, the combined sample would pick up the initial-year effects of new firms born in different years in the overall TFP measures, thus yielding a higher cumulated TFP growth rate than the one observed in new establishments by themselves.

A test of the vintage hypothesis.--In general the TFP curve for "new" enterprises lies above the TFP for "old" ones. The wedge is more or less uniform across years, as may be seen from Table 3.8a, with slight upward trend in 1983-84. The reason why the vintage model probably fails to apply to Bangladesh must be sought in the underlying theory of embodied technological change. New machines in western countries embody superior technologies. Whether or not the newcomers in Bangladesh have installed newer and superior machines and along with that adopted improved methods of management, accounting, marketing, and balancing remains to be verified. A prima facie evidence from the present results is that that has probably not been significantly the case.

4.5. Any indication of the impact of NIP82 on the overall manufacturing sector?

The New Industrial Policy 1982 (NIP82) was issued in June 1982. The CMI merge file that we have prepared has data for 2 years after the NIP82, namely 1982-83 and 1983-84 and several years before NIP82. In the first year of the post-NIP82 period,

entrepreneurs probably did not have enough opportunity to make adjustments and carry out productivity-increasing measures. Probably, they needed time to take stock of the new environment and test the permanence of new policies and the stability of the new government. As such, it was probably too early in that year to expect significant impact of incentives. There is much less reason for not expecting the impact of the full range of incentives in 1983-84, however. There is little evidence for a positive impact of NIP82 on TFP growth rates in 1982-83 in relation to 1981-82. Thus, in the "old" sample 83 out of 373 establishments attained TFP indices exceeding unity in 1981-82 and only 70 in 1982-83. In the "new" sample, of the 658 establishments of 1981-82, 309 experienced TFP>1 and 349 TFP<1 in 1981-82; out of the same cohort of establishments in 1982-83, 297 had TFP>1 and 362 and TFP<1. The same result persists at the 4-digit-industry level. Thus, between 1981-82 and 1982-83, the industries which attained positive TFP growth rates (TFP>1) declined by a shade from 39% to 36% in the "old" sample and remained constant at 44% in the "new" sample and 39% in the "overall" census, as may be seen from Table 3.8a.

From 1982-83 to 1983-84, however, feeble though it is, some evidence for a positive impact of policies seems to show up. As may be seen from Table 3.8a and Fig. 3.6 the establishments experiencing TFP>1 jump up from 39% in 1982-83 to 51% in 1983-84 for the "old" sample; from 44% in 1982-83 to 59% in 1983-84 for the "new" sample; and from 39% in 1982-83 to 52% in 1983-84 in the "overall" sample. A similar result emerges at the industry level, where the corresponding percentages go up from 36

to 51 in "old", 44 to 59 in "new", and 39 to 62 in "overall" samples (Table 3.8a). The results hold even when we look at the same cohorts of establishments in the "new" sample over two years--e.g., the 831 establishments of 1983-84 which were also in operation in 1982-83. Thus as may be seen from the second and third lines of the "new" sample in Table 3.8a, there was no change between 1981-82 and 1982-83, but a positive change after that. One must remember, however, that an incumbent president was assassinated in 1981, when the country plunged into confusion and there were long work stoppages. Therefore more analysis for longer periods after 1982 is in order before drawing conclusions.

4.6. Any evidence of differential impact of NIP82 on small and large enterprises?

Finally, we ask the key question: What can be learnt from the TFP exercise about the impacts of policies on small versus large enterprises? The results to that effect are summarized in Table 3.8b and Figs. 3.7 and 3.8.

It may be seen that the TFP indices of new establishments for the post NIP82 (1983-84) period lie clearly above those for the earlier (1982-83) period, across all size-classes (Fig.3.7). The productivity attainment among large-size establishments is much more impressive than other size-classes. The U-shape of the curve, nevertheless, continues to hold.

Old estabishments as a whole fail to register productivity gains in 1983-84. As between size-classes, all establishments between 20-100-worker size-classes have suffered a deterioration

in TFP (see Table 3.8b). The below-20-worker size-class has not suffered any deterioration in TFP. The 100-plus size-class has shown improvement. The results must, however, be seen in a dynamic context inasmuch as some of the medium establishments might have expanded so much as to move up to the 100-and-over-worker size class while some might have dropped down. That possibility, i.e., mobility of firms across size-classes, will be investigated in the next section. The conclusion of this subsection may be summed up by stating that insofar as the TFP criterion is applicable, large establishments have probably gained from NIP82 in all samples.

4.7. Mobility of establishments between size-classes

The productivity measures of the preceding sections were done by classifying the establishments once for all based on the initial-year (1973-74) data and then following them through (without reclassifying them in subsequent years) irrespective of their expansion/contraction. That procedure was followed as a matter of convenience of calculation. In the present section we look at the inter-size-class mobility of establishments to learn about firm dynamics. The results are presented in Tables 3.9-3.11 for the old, new and moribund establishments. The changes in the distributions of old and new establishments between size-classes from 1973-74 to 1983-84 are sketched in Fig. 3.9.

Mobility within the "old" sample.--In the "old" sample of 373 establishments, 56 moved up and 22 moved down in 1975-76 (Table 3.9). The corresponding figures are 37 up and 72 down

after the next 3 years; 31 up and 26 down in 1980-81; 28 up and 16 down in 1981-82; 14 up and 27 down in 1982-83, the year of the NIP82; and 23 up and 41 down in 1983-84. The gross movement in 1983-84 comes to 78 units (or 20 percent of total establishments), 56 upwards and 22 downwards. The highest rate of expansion was from among the initial units of the lowest (<20) class-size (48%). Of the 6 that moved up from the <10 class in 1975-76, 3 entered the 10-19 class, 2 the 20-49 class, and 1 the the 50-99 class--a remarkable expansion in one year. Of the 38 that expanded from the 10-19 class in 1975-76, likewise, 33 stopped in the 20-49 class, 3 went up to the 50-99 class, and 1 to the 100-&-over class. From the 20-49 and 50-99 classes, about as many went down as went up in that year. The rate of mobility is relatively lower among bigger size-classes, which, of course, may be a statistical illusion as the largest group is an open-ended class. As such, only downward movements can be recorded. Relative changes for other years are not much different from those for 1975-76, as may be seen from Table 3.9. It may be noted, however, that more establishments moved up than moved down only during 1975-76 and 1980-81. In anticipation, it may be noted that we will come across a supporting evidence in Ch.4, where the highest growth rate of mechanized establishments since 1972 is recorded for 1980-81 and the next high for 1975-76 (look for Figs. 4.1-4.4).

Net mobility -- which may differ from year-to-year changes due to differences in distances of movement--over the entire period of 10 years was upwards, as may be seen from Table 3.9b: between 1974-75 and 1983-84, 144 establishments move up, 96 moved down, and 148 stayed put. From the initial structure, only 22% stayed put in

<10-worker size-class, 46% in the 10-19 worker class, 56% in the 20-49-worker class, 42% in the 50-99-worker class, and 50% in the 100-199-worker class. At the same time, although the top size-class contracted a bit and the lower ones gained a scrap, allowing for standard errors, almost all size-classes ended up, more or less, even, as may be seen by comparing the corresponding size-class figures in the last column of Table 3.9b with those in the last row.

Mobility within the "new" sample.--The mobility among new establishments has been higher than old establishments, attaining a mean rate of 20% against 14% for old units (compare results of Table 3.9 and 3.10). Among the new estabs, significantly high net upward mobility has persisted almost throughout the reference period. Apart from the mathematical fact that the lowest establishments can only move up (except when they exit) and the largest ones can only move down, a difference between the new and the old establishments that strikes the eye is a relatively high downward mobility among the new 10-19-worker, small establishments. There is a clear evidence that many of those that started with <10 workers rapidly expanded. Many of those that started with 10-19 workers, on the other hand, suffered rapid descent, but many moved upwards also. The high mobility as well as the observed high death and birth rates are normal and, indeed, a sign of industrial health and progress--more efficient firms are quickly sorted out from less efficient ones.

Inter-size-class mobility among "new" establishments should be distinguished from the initial distribution of new

entrants. It may be seen from Table 3.10, last panel, that new additions in 1983-84 were fewer than those in 1975-76 only in the 100-and-over size-class. As a matter of fact, the curve of percentage changes in the number of establishments (new entrants) from low to high size-classes in the "old" ("new") sample declines rather sharply and almost monotonically (see Fig. 3.9). Thus the rates of entry from both old and new cohorts of establishments are substantially higher in small than large establishments. On the whole, the net result is, that Bangladesh's enterprises are not expanding, they are multiplying.

Mobility among "moribund" establishments.--Surprisingly, the rate of mobility among moribund establishments (about 18%) is not lower than in other groups. It is possible that mobility is not a well-planned, long-term activity. Rather it may be the result of transitory, unforeseen ups-and-downs of demand for product and/or supply of raw materials. The hiring and firing of workers does not, thus, seem a serious constraint or unduly costly to enterprises. Except for the first year, 1975-76, a general pattern for exiters seems to be first, to shrink and then exit. Not surprisingly, bigger units appear to have slightly higher survivability--those that have exited have taken a little longer to do so.

In summary, a high rate of inter-size-class mobility prevails in Bangladesh manufacturing firms, which is a sign of health rather than malaise. The upward mobility rate is seemingly higher among smaller units than medium units, though that is largely a mere statistical illusion, inasmuch as the absolute lengths of small-unit ranges are shorter than medium-

unit ranges in our classification. Similarly large movements may be going on within the latter ranges.

4.8. Factor intensities

A final nonstochastic exploration into the efficiency of enterprises of different size-classes is made by calculating various factor intensities and single-factor productivities by size-class of workers. The results are presented in Table 3.12. Four of the pertinent variables are also sketched in Fig. 3.10 (VA/Q), Fig. 3.11 (W/Q), Fig. 3.12 (K/N), and Fig. 3.13 (VA/N), using uncorrected K for all the three samples, as only the relative capital intensities are of main interest here.

Interestingly, VA/Q ratio is higher in the "old"-establishment sample than in both other samples across all size-classes, as may be seen from Fig. 3.10.

These ratios are consistently higher in large establishments than small ones. In old and new samples, in fact, the ratios increase almost monotonically with size-class (see Fig. 3.10). A higher VA/Q ratio in a cross-section does not necessarily reflect higher efficiency in the processing of raw materials as between industries, but should be expected to do so as between size-classes of establishments of the same industry. Among the possible explanations of a higher number of establishments that have higher VA/Q ratio in the "old" sample than in the other two samples may be mentioned in the following: Older establishments are more vertically integrated than new ones. Most new establishments in the textile group, for instance, are in the garment-making line, which add relatively

low value as compared to giant textile mills. The raw material costs of large, old industries with political connections may be artificially understated as a result of disparate concessions, such as low-duty imports. The raw materials used by them may be of higher quality due to similar import facilities. The degree of protection enjoyed by them is likely to be higher, which would inflate the value of the otherwise not-so-high physical production. Finally, they may have installed superior raw-material-processing technology. Which of the several explanations--lower purchase price of raw materials, better quality raw materials, more technologically advanced processes, more efficient use of raw materials, or low surpluses/profits--cannot be determined without additional data on the impact of policies (which data are in the process of being generated by this project).

In Section 4.3 a negative correlation between VA/Q and TFP growth rates over time in the "new" sample (Table 3.6) and practically an invariance of VA/Q with TFP in the "old" sample (Table 3.4) were observed. In Tables 3.2 and 3.6, the TFP x size-class curves were found to be U-shaped. On the other hand in cross-sections (specifically that for 1983-84), the mean VA/Q ratios rise with size of establishments (Table 3.12). The observance of this kind of tenuous associations is not uncommon in nonstochastic crosstabulations. They will hopefully be sorted out in the stochastic analysis.

Likewise labor's share in output (though not necessarily in VA) is substantially higher in old establishments than new and moribund units across all size-classes (see Fig. 3.11). Among the possible explanations are (a) a higher VA/Q ratio in old establishments just seen, (b) low surpluses, such as the notorious operating losses of public enterprises, and (c) relatively higher wages in these, mostly publicly-owned, old enterprises, at least in comparison to "moribund" industries as may be seen from the following values averaged out from a random sample of the respective group of establishments:

	Mean Annual Wage Rate in Thousands of Takas	
	Operatives	Administrative/ Managerial
"Old" (1983-84)	10.64	25.49
"New" (1983-84)	10.52	22.27
"Moribund" (1974-75)	3.15	12.26
(In 1983-84 prices)	5.89	22.94

In both new and old establishments the wage shares are higher in 10-50-worker establishments than those on both sides of this range--the W/Q curve depicts a kind of inverted V shape.

Capital-labor ratios are higher in "new" enterprises and lower in "moribund" enterprises than in "old" enterprises across all size-classes, as expected (the reasons for this were explained earlier). It may be recalled from earlier discussion that capital is likely to be artificially understated in both "old" and "moribund" establishments in comparison to "new" units. There is little evidence for capital-saving technology in less-than-ten-worker establishments. In "moribund" establishments, the K/N ratio is practically uniform across size-classes. In "new" establishments, the K/N ratio is horizontal upto 99 workers. In the "old" sample, there is some evidence for a lower K/N ratio in 10-49-worker class, but combined with the rest classes, the differences are not clear-cut. In short, insofar as the CMI data set is concerned, in none of the key factor-intensity ratios (Fig. 3.10-.13) small establishments are found to lie on the desirable side. It is very important, therefore, to study the efficiency differences between size-classes by generating more authentic data, particularly on capital, as K/N ratio is a major characteristic claimed for small enterprises.

Finally, as may be seen from Fig. 3.13, the VA/N ratios in all the three samples are exorbitantly higher in the 200-and-over establishments than small and medium establishments, much more in the old than other estabs. All these ratios are, naturally, related; the conclusions of one reinforce those of the others.

The picture of the relative magnitudes of the ratios of Table 3.12 may be summarized as follows:

	$\frac{VA}{Q}$	$\frac{VA}{N}$	$\frac{W}{Q}$	$\frac{K}{N}$	$\frac{N_2}{N_1}$	w_1
Large estabs	High	High	Low	Not low	Low	High
Medium estabs	Middle	Middle	High	Low	Middle	Low
Small estabs	Low	Low	Low	Not low	High	Low
Old estabs	Higher	Higher	Higher	Mid	Same	High
New estabs	Mid-high	Mid	Lower	Higher	Same	High
Moribund estabs	Lower	Lower	Mid	Lower	Same	Low

It may be seen that small enterprises are on the desirable side at best only in K/N.. They provide higher employment per unit of capital. Although these results are based on the mean values of the ratios of Table 3.12, in the case of K/N even the incremental ratio in small establishments is highly likely to be low. In all other ratios, small enterprises do poorly.

An interesting case is revealed by a high N2/N1 ratio (administrative personnel/operatives--note that working proprietors are not included in N2) in small enterprises. To study the behavior of the N2/N1 variable a bit further, a crosstab of Nx(N2/N1) is presented for the "moribund" sample in Table 3.13. It may be seen that the matrix of Nx(N2/N1) is thick in the S-W to N-E direction (a finding not commonly expected) rather than the N-W and S-E direction, implying a relatively higher N2/N1 ratio for small establishments in comparison to large establishments. In small establishments, more supervisory

and managerial staff is needed, firstly, because relatively low-skilled workers need more supervisions; secondly, the capacity of the low-paid management of these establishments to do its job is likely to be relatively lower than that in large establishments, and finally, there are probably large scale economies of management.

From the viewpoint of future growth, this is an optimistic, rather than a bleak picture. The results provide an indication of high payoff from investing in the training of managers of and for small enterprises.

By way of contrast, the corresponding matrix of Nx(VA/Q) is also given in Table 3.13. This matrix is thick in the N-W to S-E direction. Note that the .20-.29 VA/Q ratio is, more or less, uniform across all size-classes. The very small, <10-worker establishments present an interesting case of a higher VA/Q ratio than that in the 10-49-worker establishments. (Compare the entries of Cols. 6 and 7 in relation to those in Col. 8 for the noted size-classes). The results could, however, be biased due to the unrepresentativeness of small establishments in the CMI.

4.9. Summary of Findings

Two of the main findings of the analysis, among others, are (a) our failure to assess the impact of NIP82 on the total factor productivity (TFP) of manufacturing industries due to lack of data beyond 1983-84 when the effects might appear with some lag and (b) the emergence of U shape of the TFP curve with respect to size-classes of establishments. A short elaboration of the latter finding and a summary of some of the ancillary findings follows:

In all the three samples, both increasing-TFP and declining-TFP establishments are found in the same industry. A possible inference from these findings is that individual entrepreneurs and firm efficiency, more than the type of industries, make major difference to productivity growth. A policy implication of it is the need to allocate more resources and higher priority to the training of entrepreneurs and managers of and for small enterprises. A support for this policy implication comes from a high ratio of administrative and managerial personnel to operatives in small enterprises in relation to medium and large enterprises. A second policy implication is to develop/adapt and diffuse technological innovations on a much larger scale than has been done so far by the country's Science and Technology organizations.

During the 10-year reference period, 1974-75 to 1983-84, changes in the output (in constant prices) of the 373 old establishments were imperceptible, employment increased by 13 percent, while value added declined by about a fifth. Output per worker in 1983-84 was Taka 93000 in "old" enterprises and Taka 167000 in "new" enterprises.

The modal size-class in terms of number of establishments is that of 20-49 workers. In terms of productivity, however, fewer-than-20-worker size-class and more-than-49-worker size-class have been found more dynamic than middle-size classes. The finding about the small size, however, need to be checked further with alternative data sets, because the CMI data for this size-class are weak.

The analysis of exit-entry, especially as between small-versus-large establishments, would not be complete without a study of inter-size-class mobility of firms. In the context of the size-classification of this study, the mobility rate even among the "old" firms is quite high, which should ordinarily be a symptom of the health rather than the malaise of the economy, but in the case of Bangladesh may be an index of industrial sickness. In this sample, more establishments moved up than moved down only during 1975-76 and 1980-81. The overall result signifies a downward net mobility of establishments during the 10 years of the reference period. What made 1975 and 1980 good for investment and expansion of employment remains to be verified.

On the average, for every 5 establishments that enter the manufacturing industry, one shuts down. The exit-entry pattern across establishments is, by and large, similar except for a weak evidence for a somewhat higher death rate among small (<10-worker) establishments and lower among large (99+) establishments. The mean annual rates of growth of workers and the establishments analyzed here were 3.9 percent and 8.7 percent, respectively (refer to Table 3.1).

An exploration into possible differential impact of NIP82 as among different size-classes of establishments suggests that in the "old" sample at best only the large establishments have benefited. In the case of newly established enterprises little differentials are discernible.

Finally, the analysis of factor intensities throws further light on the efficiency of different size-classes as well as

yields some policy implications. A critical need for expanding, and assigning high priority to entrepreneurial and management training, implicated by earlier results of this study, is further strengthened by the finding of a substantially higher N2/N1 ratio in small enterprises than medium and large ones (where N2 stands for administrative personnel and N1 for operatives). Despite the growth of establishments across all size-classes, expansion in absolute employment came predominantly from large enterprises.

There is no evidence of labor-saving bias (as measured by capital/labor ratio, K/L) in small enterprises as against medium and large ones in the subsamples of "old" and "moribund" enterprises, as may be seen from Table 5. In "new" enterprises in which the measures of capital stock are likely to be more reliable, the size-class with 100 workers or more is about 3 times as capital-intensive as lower ones. Upto 100 workers, however, the K/L ratio is uniform.

Value added to output ratio (VA/Q) increases almost monotonically and significantly with size of firm in all the three subsamples (see Table 5). Value added to labor ratio (VA/L) increases sharply with size. The wage bill to output ratio (W/Q) is more or less uniform in "old" and "new" firms, but rises moderately in "moribund" firms. The ratio of (wedge between) the wage rate of managerial and technical staff and that of operatives is roughly 0.25 in "moribund" firms and 3.0 in "new" firms.

In brief, the findings fail to support the impression that small enterprises are labor-intensive. The growth rate of TFP of large enterprises is significantly higher than that of small and

medium firms, but the results between small and medium ones show small ones more dynamic than medium ones, though that result has to be taken with a grain of salt as the CMI data on small enterprises is weak. On the other hand, the performance of large enterprises in terms of value added per worker, per unit of output, and per unit of capital is definitely superior to small ones. It remains to be seen whether this might not be due to policy discrimination.

In the end, it should be noted that the analysis by crosstabulations (as done in this chapter) can gain only a limited mileage--it largely identifies associations between pairs of variables. The sources of productivity growth and quantitative influences on TFP of different variables, including policies cannot be determined without econometric analysis. The results of this section should, therefore, be treated provisional, until that analysis is done (see the last section).

Table 3.1.--The sample sizes of the "old," "new," and "moribund" units analyzed in this chapter, CMI, 1974-75 through 1983-84

Type of Establishment Sample	Total no. of estabs and workers by year							Total in 1983-84
	74-5	75-6	79-80	80-1	81-2	82-3	83-4	
1. "Old" (Total)								
Units	373	373	373	373	373	373	373	760
Workers	161104	162501	179106	180500	178729	174957	181743	370000
2. "New" (Increments)								
Units	0	147	503	163	198	262	342	..
Cumulated	0	147	650	813	1011	1273	1615	1995
Workers	0	35209	28932	7429	12611	10570	17052	..
Cumulated	0	35209	64141	71570	84181	94751	111803	123000
3. "Moribund" (Survivors)								
Units	541	136	91	72	51	30	0	..
Workers	44619	29334	21758	15831	11016	9558	00	..
4. Not analyzed								
Units	..	..	..	..	..	..	..	1218
5. Total: Units	904	..	1114	1258	1435	1676	1988	3206
Workers	205723	227004	265005	267901	273926	278266	293546	293546
6. Annual rates of growth:								
Units(%)	..	..	12	13	14	17	19	8.7[a]
Workers(%)	..	10	17	1	2	2	5	3.94[a]

[a]Mean annual growth rate

Table 3.2.--Number of establishments by TFP and size-class of workers, old enterprises, CMI

Index of TFP	No. of Employees in Year 1983-84						
	<10	10-19	20-49	50-99	100-199	200 & Over	Total
			1983-84				
1. < .25	(20)	16	15	20	14	85	
2. .25 - .49	(9)	25	13	10	14	71	
3. .50 - .74	(9)	8	8	4	15	44	
4. .75 - .99	(9)	8	7	2	8	34	
5. 1.00 - 1.49	(21)	15	5	6	24	71	
6. 1.50 - 1.99	(8)	6	4	4	17	39	
7. 2.00 & Over	(14)	10	2	5	15	44	
8. <1	(47)	57	43	36	51	234	
9. 1 & Over	(43)	31	11	15	56	156	
10. Total	(90)	88	54	51	107	390	
11. 7 as % of 10	(16)	11	4	10	14	12	
12. 6+7 as % of 10	(24)	18	11	18	30	22	
			Cumulated from 1975-76 through 1983-84				
13. < 1	11	32	57	40	35	51	226
14. > 1	12	29	32	10	13	51	147
15. Total	23	61	89	50	48	102	373
16. 14 as % of 15	52	47	36	20	27	50	39

Table 3.3.—Number of establishments with +'ve and -'ve changes in workers from 1975-76 to 1983-84 by TFP and size-class of workers, Old Establishments, CMI

The number of establishments with negative (-) or positive (+) change in M from 1975/76 to 1983-84 by size-class of workers in 1983/84

Index of TFP	<20		20-49		50-99		100-199		200 & Over		Total		
	+	-	+	-	+	-	+	-	+	-	+	-	Total
Cumulated to 1983-84													
1. < .25	1	21	4	8	9	5	8	11	12	6	34	51	85
2. .25 - .49	2	10	9	17	8	3	6	5	10	3	35	38	73
3. .50 - .74		10	6	2	1	7	3		11	6	21	25	46
4. .75 - .99	1	5	3	4	5	2		1	5	3	14	15	29
5. 1.00 -1.49	3	18	9	10	2	2	3	2	13	8	30	38	68
6. 1.50 -1.99	1	7	2	5	2	4		1	16		21	17	38
7. 2.00 & over	4	10	4	6	2		1	4	10	6	21	26	47
8. Total	12	81	37	52	29	23	21	24	77	32	176	210	386
9. Grand total	93		89		52		45		109				386
Final Year (1983-84)													
10. <1	4	46	22	31	23	17	17	17	38	18	104	129	233
11. 1 & over	8	35	15	21	6	6	4	7	39	14	72	81	153
12. Total	12	81	37	52	29	23	21	24	77	32	176	210	386

Table 3.4.—Number of establishments with -'ve and +'ve changes in VA/Q and VA/N (from 1975-76 to 1983-84 by TFP, Old Enterprises, CMI)

Index of TFP	No. of establishments with -'ve or +'ve changes in (VA/Q)			(VA/N)		
	No.of + Signs	No.of - Signs	2/(2+3)	No. of + Signs	No.of - Signs	5/(5+6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cumulated to 1983-84						
1. - <.25	48	35	58	67	19	78
2. .25 - .49	35	34	51	55	15	79
3. .50 - .74	22	21	51	43	3	93
4. .75 - .99	18	12	60	28	4	88
5. 1.00 - 1.49	41	28	59	68	1	99
6. 1.50 - 1.99	20	15	57	36	2	95
7. 2.00 & over	20	20	50	43	1	98
Final Year (1983/84)						
8. 1	123	102	55	193	41	83
9. 1 & over	81	63	56	147	4	97
10. Total	204	165	55	340	45	88

Table 3.5.--Cumulated total-factor productivity (TFP) and certain other pertinent variables, "old-enterprise sample"[a]

Industry code and name	Cumulat TFP	Employment			Wage Rate: Operatives			Wage Rate: Admn.			Wage Rate: Others			VA/N			% in VA/Q
		75-76	83-84	%	75-76	83-84	%	75-76	83-84	%	75-76	83-84	%	75-76	83-84	%	
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1. 3815 Trunks & suitcases	3.1763	13	6	-54	2000	2955	48	3000	3668	22	135	129	-4	2923	5166	77	..
2. 3816 Nails	2.7818	191	148	-23	3110	3126		6500	7949	22	802	4615	475	837	2912	248	-
3. 3824 Textile machinery	2.6824	6	8	33	2500	2609	4	3000	3465	15	64	173	170	4833	7750	60	-
4. 3819 Fabricated metals	2.4734	69	98	42	4710	3069	-35	11000	8442	-23	1510	6661	341	11072	8397	-24	-
5. 3827 Sewing machines	2.3151	5	5	-	4000	2988	-25	-	-	-	92	113	23	3800	9600	153	+
6. 3202 Woollen textile	2.1339	471	342	-27	3860	4871	26	33000	15287	-54	8782	18175	107	1662	22070	1282	+
7. 3311 Saw & planning mills	1.8822	19	21	10	2550	1671	-34	5000	3261	-34	512	317	-33	16052	3571	78	-
8. 3712 Iron & Steel Rods	1.8455	98	126	28	3000	3750	25	14500	5788	-60	4429	26101	489	13000	23801	83	-
9. 3829 Mach. and equipment	1.6403	41	27	-34	3590	2148	-40	-	4076	-	264	270	2	731	2962	305	+
10. 3516 Plastic products	1.5677	191	148	-22	5310	313	-41	8000	10379	-30	6775	4847	-28	26424	18939	-28	+
11. 3115 Refined Soyabean	1.5445	200	465	132	5870	5320	-9	21950	16103	-27	14196	23688	67	133495	236606	315	+
12. 3938 Umbrella & sticks	1.3196	69	73	6	2790	2380	-15	55000	6033	21	1364	1231	-10	5840	5356	8	+
13. 3822 Agri. Mach. Equip.	1.2417	228	167	-26	3920	4692	20	12000	9172	-24	2184	4390	101	4267	10311	142	++
14. 3501 Allopathic medicine	1.2310	1546	2226	44	6990	6375	-9	25330	24606	-3	10702	25016	134	25644	60064	134	+
15. 3216 Spooling & Thread	1.2066	35	18	-48	2640	2445	-7	4000	3465	-13	482	333	-31	8857	5055	-43	-
16. 3839 Misc. elec. products	1.2022	39	49	26	1710	1753	2	8500	5707	-33	384	739	92	3564	4428	24	-
17. 3411 News print	1.1703	2627	2669	1	3790	6803	79	30000	11479	-62	91156	264797	190	-834	2310	377	-
18. 3119 Rice milling	1.1728	75	16	-79	1000	1426	43	6000	4076	-32	328	42	-87	4800	2000	-58	+
19. 3122 Hair oil and cream	1.1567	11	13	18	2370	1492	-37	4000	2853	-29	141	128	-9	3818	2769	-27	-
20. 3523 Coal tar (Alkatra)	1.1380	111	71	-36	3360	2898	-14	11160	9547	-14	3674	3839	4	8540	13056	53	-
21. 3937 Fountain pens	1.1340	99	79	-20	1930	2719	41	6000	5230	-13	1364	1231	-10	4071	4949	21	+
22. 3525 Match box	1.0570	8922	7450	-17	4010	4472	11	12930	13620	5	12061	13337	44	1	13151	71	+
23. 3949 Brush all types	1.0563	14	13	-7	2450	2392	-2	5000	2853	-43	216	450	108	4857	22076	354	+
24. 3304 Steel metal almirah	.9899	108	166	-	4830	4549	-6	10710	7371	-31	1076	2100	95	3388	7896	133	+
25. 3213 Knitting mill	.9884	596	460	-23	2200	2642	20	6450	4721	-27	16503	23876	45	5115	9832	92	+
26. 3521 Paints/enamels	.9814	270	307	14	4110	5691	38	31860	11182	-65	27172	30802	13	58100	5337	-91	-
27. 3823 Printing,Type, Block	.9545	56	55	-2	5580	3913	-30	15000	8153	-46	672	693	3	5250	8072	29	-
28. 3825 Industrial mach.	.9418	115	142	23	2770	2882	4	11000	8459	-23	1566	1489	-5	5791	4471	-23	..
29. 3234 Leather & skins	.7318	660	685	4	4350	3677	-15	11480	11577	.08	198552	167086	-16	3601	45477	1163	-
30. 3515 Phenyle	.7031	17	19	12	2800	3228	15	6000	6522	9	1108	993	-10	9294	9105	-1	-
31. 3201 Cotton yarn	.6959	24859	24686	-	4330	4447	3	21310	11846	-44	74861	78712	5	10579	13545	27	+
32. 3591 Bricks & clay	.6747	372	377	-39	3620	3978	10	12660	10546	-17	8623	7140	-17	11153	17925	61	-
33. 3204 Silk & synthetics	.6613	350	329	-6	1700	2339	38	4580	4484	-2	2511	4042	61	1914	4714	146	-
34. 3584 Homeopathic medicine	.6603	79	70	-11	2820	2666	-5	6500	3873	-40	1399	1427	2	6582	7757	18	-
35. 3205 Narrow fabrics	.653	108	123	14	2560	2560	-17	5900	5503	-8	2607	2104	-19	7583	8447	24	-
36. 3802 Hand & Edge tools	.6296	38	43	14	1650	2756	67	4500	5707	27	444	508	14	2736	8291	149	-

Table 3.6.—Distribution of total factor productivity by number of workers in 1983-84, CMI: "New" Establishment sample[a]

Total factor productivity index	No. of establishments by size classes of workers in 1983-84									
	<20	20-49	50-99	100-199	200&+	Total	No. of +'ve changes in 83-84 over initial year			
							N_{84} / N_0		$(VA/Q)_{84}$ / (VA/QPVoPV)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(No.)	(%)	(No.)	(%)
A. Cumulated										
1. 0.00 - 0.24	12	15	4	6	4	41	17	41	31	76
2. 0.25 - 0.49	54	46	19	6	5	129	52	40	98	58
3. 0.50 - 0.99	172	188	45	27	15	447	149	33	251	56
4. 1.00 - 1.49	137	75	17	17	15	261	94	42	124	48
5. 1.50 & over	92	36	15	13	31	187	54	29	74	40
6. Total	467	360	99	69	70	1065	356	33	568	53
B. In 1983-84										
7. Less than 1.00	192	207	59	37	11	506	172	34	299	57
8. 1.00 & over	275	153	40	32	59	559	184	33	279	50
9. Total	467	360	99	69	70	1065	356	33	568	53
10. 5 as % of 6	20	10	15	19	44	18	15	88	13	76

[a]The numbers in the last two columns, 7 and 9, indicate, respectively, the number of +'ve changes in the absolute number of workers (N) and the number of value-added-to output (VA/Q) ratios in the total number of changes of Col. 6 from the initial year of production to 1983-84.

Table 3.7.--TFP in 1983-84: Results for ol, new, nd moribund estabs, CMI[a]

Sl. No.	Industry code	Total Factor Productivity (TFP)		
		New estab. sample	Old estab. sample	Moribund estab. sample[b]
(1)	(2)	(3)	(4)	(5)
1.	3112	1.1453	..	1.1379
2.	3113	0.6731	..	..
3.	3114	0.8981	2.24	..
4.	3115	..	1.81	..
5.	3116	1.0008	.78	..
6.	3117	1.4000	..	..
7.	3118	1.3112	.88	0.7094
8.	3119	..	.88	0.1109
9.	3122	0.5287	.28	0.4753
10.	3125	0.9341	2.66	0.2941
11.	3126	0.6019	.53	0.5558
12.	3127	0.6400	..	..
13.	3128	0.7088	..	..
14.	3131	..	.71	..
15.	3134	..	.20	..
16.	3141	..	.73	..
17.	3144	1.1292	.66	..
18.	3145	1.0059	..	0.8411
19.	3201	1.1201	.95	1.0545
20.	3202	..	1.44	..
21.	3203	1.4713	1.14	0.0734
22.	3204	1.3895	1.12	0.4578
23.	3205	1.0356	1.05	1.2351
24.	3206	0.6014	.75	0.8469
25.	3213	1.2427	1.12	1.2921
26.	3207	..	..	0.2939
27.	3214	1.2199	..	..
28.	3215	0.7038	..	..
29.	3216	1.0585	1.09	1.1197
30.	3221	1.3190	..	..
31.	3231	0.9770	1.08	[illegible].4831
32.	3233	1.1577	..	..
33.	3241	..	2.10	..
34.	3253	..	.84	[illegible].5585
35.	3311	0.3998	1.[illegible]	
36.	3312	1.1499	..	.
37.	3314	..	1.[illegible]1	..
38.	3321	..	1.1[illegible]	.
39.	3411	0.3499	1.29	.
40.	3412	..	[illegible]	..
41.	3413	[illegible].7741	1.21	.[illegible]1
42.	3421	2.1260	..	..
43.	3422	..	[illegible]5	.
44.	3501	0.9240	1.[illegible]7	[illegible].3[illegible]8

Table 3.7.--Contd.

(1)	(2)	(3)	(4)	(5)
45.	3502	0.9989	..	..
46.	3503	0.8377	2.02	..
47.	3504	0.9549	.39	..
48.	3515	1.0284	.81	0.7063
49.	3516	0.8698	1.11	0.9673
50.	3519	1.5626	1.03	..
51.	3521	0.9739	1.00	..
52.	3522	0.6440	1.14	0.3682
53.	3523	1.0676	.56	0.1158
54.	3524	1.2741	..	..
55.	3525	1.1754	1.40	..
56.	3526	..	1.22	..
57.	3527	1.1754	..	..
58.	3528	1.4607	1.11	..
59.	3529	1.2917	..	..
60.	3530	1.2069	..	..
61.	3541	0.8098	..	..
62.	3551	2.5357	..	..
63.	3559	1.1812	..	1.5775
64.	3569	0.8533	.79	1.7261
65.	3612	1.0949	..	..
66.	3622	1.0737	..	..
67.	3691	1.2373	.83	..
68.	3693	1.6711	..	..
69.	3695	..	.98	..
70.	3712	1.0894	1.11	..
71.	3713	0.8868	.41	0.5670
72.	3719	1.2755	1.18	..
73.	3801	0.9245	..	..
74.	3802	1.0257	.98	..
75.	3803	..	.67	..
76.	3804	1.1330	1.14	..
77.	3805	1.2102	..	0.8027
78.	3807	0.9411	.90	2.4461
79.	3808	1.3055	..	..
80.	3809	1.0175	1.37	0.6555
81.	3813	1.0737	..	..
82.	3814	.9880	..	..
83.	3815	1.2102	.99	..
84.	3816	0.9844	1.27	..
85.	3817	1.0571	.92	0.6594
86.	3819	1.2187	1.17	..
87.	3821	1.7070	..	..
88.	3822	1.4784	1.22	..
89.	3827	..	1.56	..
90.	3828	.3897	.95	1.0062
91.	3825	1.1850	1.75	3.0255
92.	3827	..	1.57	0.4361
93.	3829	1.1737	1.32	..
94.	3832	.7483	.69	..

Table 3.7.--Contd.

(1)	(2)	(3)	(4)	(5)
95.	3833	0.7494	..	1.2580
96.	3834	..	.48	..
97.	3835	1.0353	..	0.0367
98.	3836	1.0000	..	..
99.	3839	0.6454	..	..
100.	3845	1.1517	..	..
101.	3846	1.1271	1.32	0.8502
102.	3862	0.8350	.53	0.6991
103.	3936	..	.32	..
104.	3937	1.2581	1.07	0.7897
105.	3938	1.1577	1.15	0.8102
106.	3942	0.1584	.08	..
107.	3949	1.0960	1.38	..

[a]Two dots indicate "no observation" in the respective sample.

[b]For moribund establishments, the values are cumulated over the relevant years of operation. Note that at most 1982-83 is the last year of cumulation, as all establishments of this sample exited by the year 1983-84.

Table 3.8a.--Percentage of units that experienced TFP>1, by year CMI, different samples

Sample	Units that attained TFP>1 as percentages of total by year						
	75-76	79-80	80-81	81-82	82-83	83-84	Cumu[illegible]
"Old" estabs. of 77 industries (%)	70	25	44	39	36	51	31
"New" estabs. of 88 industries of 1979-80 (%)	..	45	46	44	44	59	40
658 estabs of 1981-82 (%)	..	-	-	47	45	-	-
831 estabs of 1982-83 (%)	..	-	-	-	44	58	-
Overall estabs of 110 industries (%)	55	40	48	39	39	62	36

Table 3.8b.--Number of establishments with cumulated TFP>1, 1975-76 through 1983-84, CMI

Sample	No. of Estabs by Size-Class of Workers						
	<10	10-19	20-49	50-99	100-199	200&+	Mean
"Old"							
1982-83:							
TFP>1:No.	9	34	40	14	14	49	160
(%)	(39)	(56)	(45)	(28)	(30)	(48)	(43)
Total	23	60	88	50	47	102	370
1983-84:							
TFP>1:No.	(- 43 -)		31	11	15	56	156
(%)	((48))		(35)	(20)	(29)	(52)	(40)
Total	(- 90 -)		38	54	51	107	390
Cumulated:							
TFP>1:No.	12	29	32	10	13	51	147
(%)	(52)	(48)	(36)	(20)	(27)	(50)	(39)
Total	23	61	89	50	48	102	373
"New"							
1982-83:							
TFP>1:No.	65	120	102	32	20	34	373
(%)	(58)	(48)	(39)	(35)	(36)	(53)	(45)
Total	112	248	261	91	55	64	831
1983-84:							
TFP>1:No.	(- 275 -)		153	40	32	59	559
(%)	((59))		(43)	(40)	(46)	(84)	(53)
Total	(- 467 -)		360	99	69	70	1065
Cumulated:							
TFP>1:No.	831	145	117	33	30	44	448
(%)	(59)	(45)	(31)	(35)	(42)	(63)	(42)
Total	141	321	367	95	71	70	1065

Table 3.7.--Mobility among size-classes of establishments, "Old" Sample, CMI, 1974-75 through 1983-84

No. of Estabs that Switched Classes by Size-Class of Workers

From (1)	To: <10 (2)	10-19 (3)	20-49 (4)	50-99 (5)	100 & + (6)	Gross Tota (7)
1. Year 1975-76						
<10	0	3	2	1	0	6
10-19	1	0	33	3	1	38
20-49	0	0	0	7	1	14
50-99	0	0	7	0	5	12
100 & +	0	0	0	8	0	8
Gross total	1	9	42	19	7	78
Net total	-5	-29	28	7	-1	0
Total moved up (upper triangle) = 56						
Total moved down (Lower triangle = 22						
2. Year 1979-80						
<10	0	4	0	0	0	4
10-19	6	0	6	1	0	13
20-49	7	29	0	12	2	50
50-99	0	4	12	0	12	28
100 & +	1	3	2	8	0	14
Gross total	14	40	20	21	14	109
Net total	+10	+27	-30	-7	0	0
Total moved up (upper triangle) = 37						
Total moved down (lower triangle) = 72						
3. Year 1980-81						
<10	0	3	0	0	1	4
10-19	6	0	8	0	2	16
20-49	1	5	0	7	0	13
50-99	0	0	6	0	10	16
100 & +	2	1	0	5	0	8
Gross total	9	9	14	12	13	57
Net total	+5	-7	+1	-4	+5	0
Total moved up (upper triangle) = 31						
Total moved down (lower triangle) = 26						
4. Year 1981-82						
<10	0	4	1	0	2	7
10-19	3	0	3	2	2	10
20-49	0	5	0	6	0	11
50-99	0	0	1	0	8	9
100 & +	0	0	1	6	0	7

Table 3.9.--Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gross total	3	9	6	14	12	44
Net total	-4	-1	-5	+5	+5	0
Total moved up (upper triangle) = 28						
Total moved down (lower triangle) = 16						
5. Year 1982-83						
<10	0	3	0	0	0	3
10-19	3	0	5	1	0	9
20-49	3	7	0	2	0	12
50-99	0	2	7	0	3	12
100 & +	0	0	0	5	0	5
Gross total	6	12	12	8	3	41
Net total	+3	+3	0	-4	-2	0
Total moved up (upper triangle) = 14						
Total moved down (lower triangle) = 27						
6. Year 1983-84						
<10	0	3	1	0	0	4
10-19	4	0	7	0	0	11
20-49	3	9	0	10	0	22
50-99	0	4	7	0	2	13
110 & +	1	3	7	3	0	14
Gross total	8	19	22	13	2	64
Net total	4	+8	0	0	-12	0
Total moved up (upper triangle) = 23						
Total moved down (lower triangle) = 41						
7. Profiles over Years						
1974-75	18	64	99	56	165	392
1975-76	8	35	127	63	159	
1979-80	18	62	97	56	159	
1980-81	23	57	96	54	162	
1981-82	19	54	93	57	169	
1982-83	22	57	93	53	167	
1983-84	21	65	93	53	159	
Mean	18	56	100	56	163	392
Total expanded from 74-75 to 83-84	12	0	37	29	98	176
Total contracted from 74-75 to 83-84	81	0	52	23	56	210

Table 3.9b.--Net mobility during 9 years from 1974-75 to 1983-84, CMI: "Old" Sample

From Size-Class	To Size-Class															
	<10		10-19		20-49		50-99		100-199		200-499		500&Over		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
<10	5	(22)	8	(35)	8	35	2	(8)	-	-	-	-	-	-	23	(100)
10-19	13	(20)	29	(46)	14	(21)	7	(10)	2	(3)	-	-	-	-	65	(100)
20-49	6	(6)	23	(25)	52	(56)	10	(11)	1	(1)	1	(1)			93	(100)
50-99	1	(2)	3	(6)	14	(27)	22	(42)	10	(19)	2	(4)			52	(100)
100-199	-	-	-	-	2	(5)	9	(23)	20	(50)	9	(22)	-	-	40	(100)
200-499	-	-	5	(4)	6	(5)	1	(1)	13	(12)	20	(17)	70	(61)	115	(100)
500 & Over													0			
Total	25	(6)	68	(18)	96	(25)	51	(13)	46	(12)	32	(8)	70	(18)	388	(100)

Sum of upper triangle cells = 144

Sum of lower triangle cells = 96

Sum of those that stayed out = 148

Note that this table may, to some extent, swallow up year-to-year differences in mobility due to variations in the distances covered by firm movements.

Table 3.10--Mobility among size-classes of establishments, "New" Sample, CMI, 1979-80 through 1983-84

No. of Estabs that Switched Classes by Size-Class of Workers

From (1)	To: <10 (2)	10-19 (3)	20-49 (4)	50-99 (5)	100 & + (6)	Gross Total (7)
1. Year 1979-80						
<10	0	5	1	2	0	8
10-19	1	0	7	2	0	10
20-49	1	5	0	11	3	20
50-99	0	0	6	0	6	12
100 & +	1	0	1	3	0	5
Gross total	3	10	15	18	9	55
Net total	-5	0	-5	+6	+4	0
Total moved up (upper triangle) = 37						
Total moved down (lower triangle) = 18						
2. Year 1980-81						
<10	0	20	6	0	1	27
10-19	19	0	34	1	2	56
20-49	2	29	0	16	2	49
50-99	1	1	6	0	14	22
100 & +	0	1	1	7	0	9
Gross total	22	51	47	24	19	163
Net total	-5	-5	-2	+2	10	0
Total moved up (upper triangle) = 96						
Total moved down (lower triangle) = 67						
3. Year 1981-82						
<10	0	23	2	0	1	26
10-19	12	0	39	2	1	54
20-49	1	31	0	13	4	49
50-99	0	0	7	0	12	19
100 & +	0	1	3	3	0	7
Gross total	13	55	51	18	18	155
Net total	-13	+1	+2	-1	+11	0
Total moved up (upper triangle) = 97						
Total moved down (lower triangle) = 58						
4. Year 1982-83						
<10	0	22	3	0	0	25
10-19	20	0	42	0	1	63
20-49	1	39	0	25	2	67
50-99	1	0	22	0	20	43

Table 3.10--Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
100 & +	0	2	5	8	0	15
Gross total	22	63	72	33	23	213
Net total	-3	0	+5	-10	+8	0
Total moved up (upper triangle) = 115						
Total moved down (lower triangle) = 98						
5. Year 1983-84						
∠10	0	19	1	0	0	20
10-19	32	0	58	0	2	92
20-49	4	56	0	24	5	89
50-99	1	1	19	0	12	33
100 & +	2	0	2	11	0	15
Gross total	39	76	80	35	19	249
Net total	+19	-16	-9	+2	+4	0
Total moved up (upper triangle) = 121						
Total moved down (lower triangle) = 128						
6. Size-Class Distribution of New Entrants						
1974-75	0	0	0	0	0	0
1975-76	13	23	44	27	43	150
1979-80	107	154	160	45	36	502
1980-81	31	54	57	11	10	163
1981-82	34	58	56	25	26	199
1982-83	21	94	102	21	21	259
1983-84	51	95	137	31	28	342
Total 1983-84	257	478	556	160	164	1615

Summary	Year	Moved Up	Moved Down
	1979-80	37	18
	80-81	96	67
	81-82	97	58
	82-83	115	98
	83-84	121	128

Table 1.11.--Mobility among size-classes of establishments, "Moribund" Sample, CMI, 1974-75 through 1982-83

No. of Estabs that Switched Classes by Size-Class of Workers

From (1)	To: <10 (2)	10-19 (3)	20-49 (4)	50-99 (5)	100 & + (6)	Gross Total (7)
1. Year 1975-76						
<10	0	2	1	0	0	3
10-19	3	0	4	0	0	1
20-49	0	1	0	4	0	11
50-99	0	0	6	0	3	9
100 & +	0	0	1	2	0	3
Gross total	3	9	12	6	3	33
Net total	0	+2	+1	-3	0	0
Total moved up (upper triangle) = 14						
Total moved down (lower triangle) = 19						
2. Year 1979-80						
<10	0	3	0	0	0	3
10-19	2	0	2	0	0	4
20-49	0	12	0	3	0	15
50-99	1	3	3	0	2	9
100 & +		1	2	4	0	7
Gross total	3	19	7	7	2	38
Net total	0	+75	-8	-2	-5	0
Total moved up (upper triangle) = 10						
Total moved down (lower triangle) = 28						
3. Year 1980-81						
<10	0	1	1	0	0	2
10-19	3	0	6	0	0	9
20-49	0	3	0	2	0	5
50-99	0	0	1	0	2	3
100 & +	0	0	1	1	0	2
Gross total	3	4	9	3	2	21
Net total	+1	-5	+4	0	0	0
Total moved up (upper triangle) = 12						
Total moved down (lower triangle) = 9						
4. Year 1981-82						
<10	0	0	0	0	0	0
10-19	2	0	1	0	0	3
20-49	0	1	0	0	1	2
50-99	1	0	2	0	0	3
100 & +	0	1	0	0	0	1

Table 3.11--Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gross total	3	2	3	0	1	9
Net total	+3	-1	+1	-3	0	0
Total moved up (upper triangle) = 2						
Total moved down (lower triangle) = 7						
5. Year 1982-83						
<10	0	0	0	0	0	0
10-19	1	0	2	0	0	3
20-49	0	1	0	1	1	3
50-99	0	0	0	0	1	1
100 & +	0	0	1	0	0	1
Gross total	1	1	3	1	2	8
Net total	+1	-2	0	0	+1	0
Total moved up (upper triangle) = 5						
Total moved down (lower triangle) = 3						
6. Distribution of Exiters						
Total existed in 1974-75	107	145	186	64	39	541
Exiters:						
1975-76	93	117	134	39	7	390
1979-80	5	14	19	9	6	53
1980-81	3	6	8	3	3	23
1981-82	1	6	5	2	1	15
1982-83	2	3	7	2	2	16
1983-84	4	7	8	2	6	27

Table 3.12.--Mean factor intensities by size-class of workers, CMI: "Old" and "new" establishments for 1983-84, "moribund" establishments for 1974-75[a]

Factor-Intensity Variable	Size Class of Workers					
	<10	10-19	20-49	50-99	100 & over	Mean
			"Old" Establishments, 1983-84			
1. VA/Q	0.3140	0.3136	0.3544	0.3706	0.4655	.3917
2. VA/N(000's)	27.5622	21.9391	42.2143	50.3768	82.2632	55.0420
3. K/N (000's)	30.5	15.2	19.2	27.7	18.4	22.2
4. W/Q	0.3296	0.5312	0.4246	0.3571	0.3638	.4035
5. E	23	65	93	52	155	77.6(388)
			"New" Establishments, 1983-84			
1. VA/Q	.25	.294	.344	.366	.365	.322
2. VA/N(000's)	19.877	20.736	24.066	42.009	58.988	28.746
3. K/N(000's)	29.290	28.977	28.911	34.923	94.04	38.034
4. N_2/N_1	.161	.093	.08	.105	.081	.096
5. w_1 (000's)	7.289	8.367	7.751	8.156	14.526	8.822
6. w_2/w_1	3.142	2.245	2.32	3.028	2.167	2.434
7. $V_3 = W/Q$	.126	.176	.215	.165	.133	.177
8. E	120	347	360	99	139	213(1065)
			"Moribund" Establishments, 1974-75			
1. VA/Q	0.2715	0.2221	0.2529	0.3196	0.3583	.0824
2. VA/N(000's)	4.4185	4.5175	5.2072	11.9396	50.0679	14.313
3. K/N(000's)	9.8754	4.7438	6.9513	9.3371	9.8642	7.846
4. N_2/N_1	.0977	0.1563	.0694	.0546	.0579	.0824
5. w_1 (000's)	2.4508	2.7771	2.8074	3.4325	6.5767	3.562
6. w_2/w_1	2.5157	2.5701	2.7326	4.9666	2.6355	3.126
7.1 W/Q	0.1532	0.2216	0.2271	0.2314	0.2704	106.2(531)
7.2 W/Q	0.1581	0.1653	0.2049	0.2467	0.3008	27.2(136)
8.1 E	106	143	183	63	36	106.2(531)
8.2 E	13	24	47	28	24	27.1(136)

[a] The numbers in parentheses in the last column state the total number of establishments. Detailed definitions of variables appear in Appendix A. Brief definitions are given here for ready reference. N2=Administrative, managerial personnel (excluding working proprietors), N1=operatives, VA=value added, Q=value of gross output, K=capital stock, w=wage rate, $V_{3.1}$=W/Q for bigger sample, $V_{3.2}$=W/Q for the sample used for TFP, E1 and E2 corresponding number of establishments. In the "moribund" sample, the larger number(531) includes the establishments that existed in 1975-76(395), for which, therefore, TFP could not be computed.

Table 3.13.—N2/N1 and VA/Q by size-class of workers, 1974-75, Moribund Sample, CMI[a]

N	No. of Estabs by Size-Class of N2/N1 and VA/Q						
	0-.04	.05-.09	.10-.14	.15-.19	.20-.29	.33 & Over	Gross Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				N2/N1			
<10	7	0	1	0	4	1	13
10-19	5	7	6	0	4	2	24
20-49	20	15	7	1	4	0	47
50-99	16	7	4	1	0	0	28
100 & +	17	4	1	0	0	2	24
	65	33	19	2	12	5	136
				VA/Q			
<10	2	0	0	1	4	6	13
10-19	5	0	0	5	6	7	23
20-49	3	4	6	4	8	19	44
50-99	4	1	1	1	4	16	27
100 & +	2	3	1	1	5	12	24
Total	16	8	8	12	27	60	131

[a]N1 = Production workers; N2 = Administrative personnel; VA = Value added; Q = Value of output; N = all persons engaged.

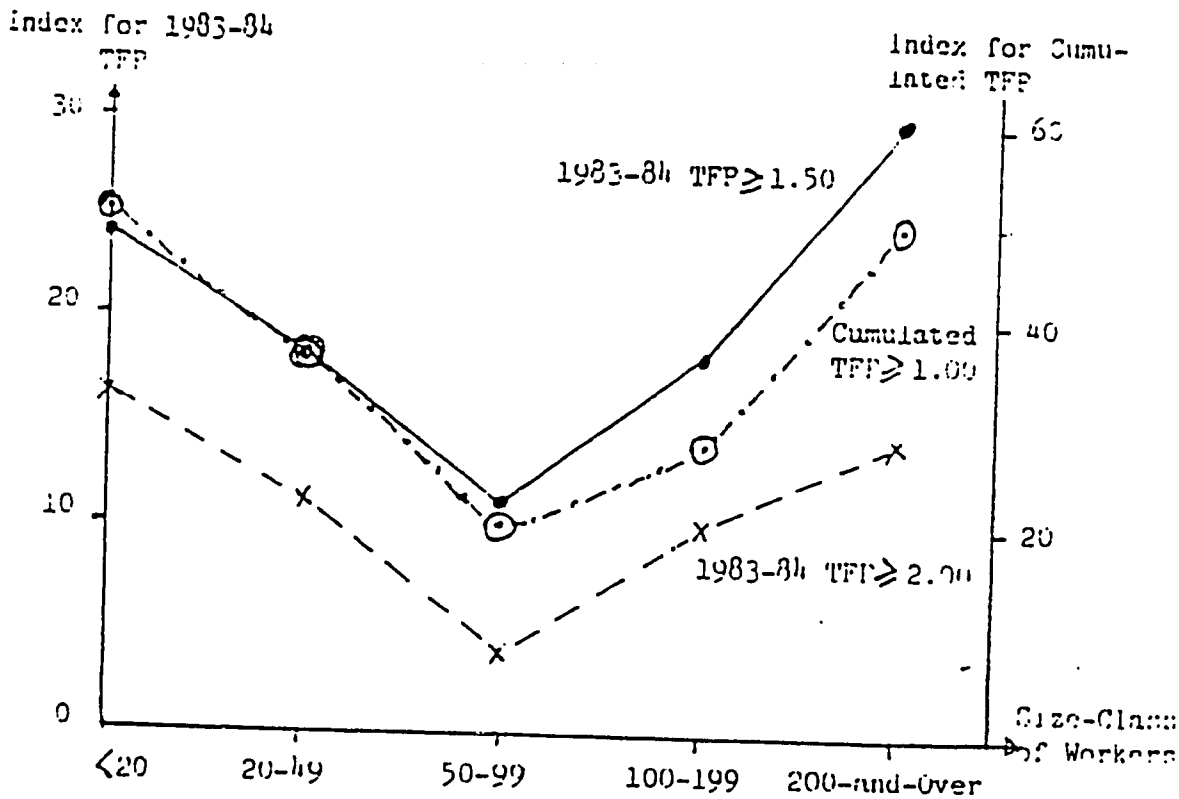

Fig. 3.1.—Percent of establishments with TFP 1.00, by size-class of workers, "old" enterprises, CMI.

Source: Table 3.2.

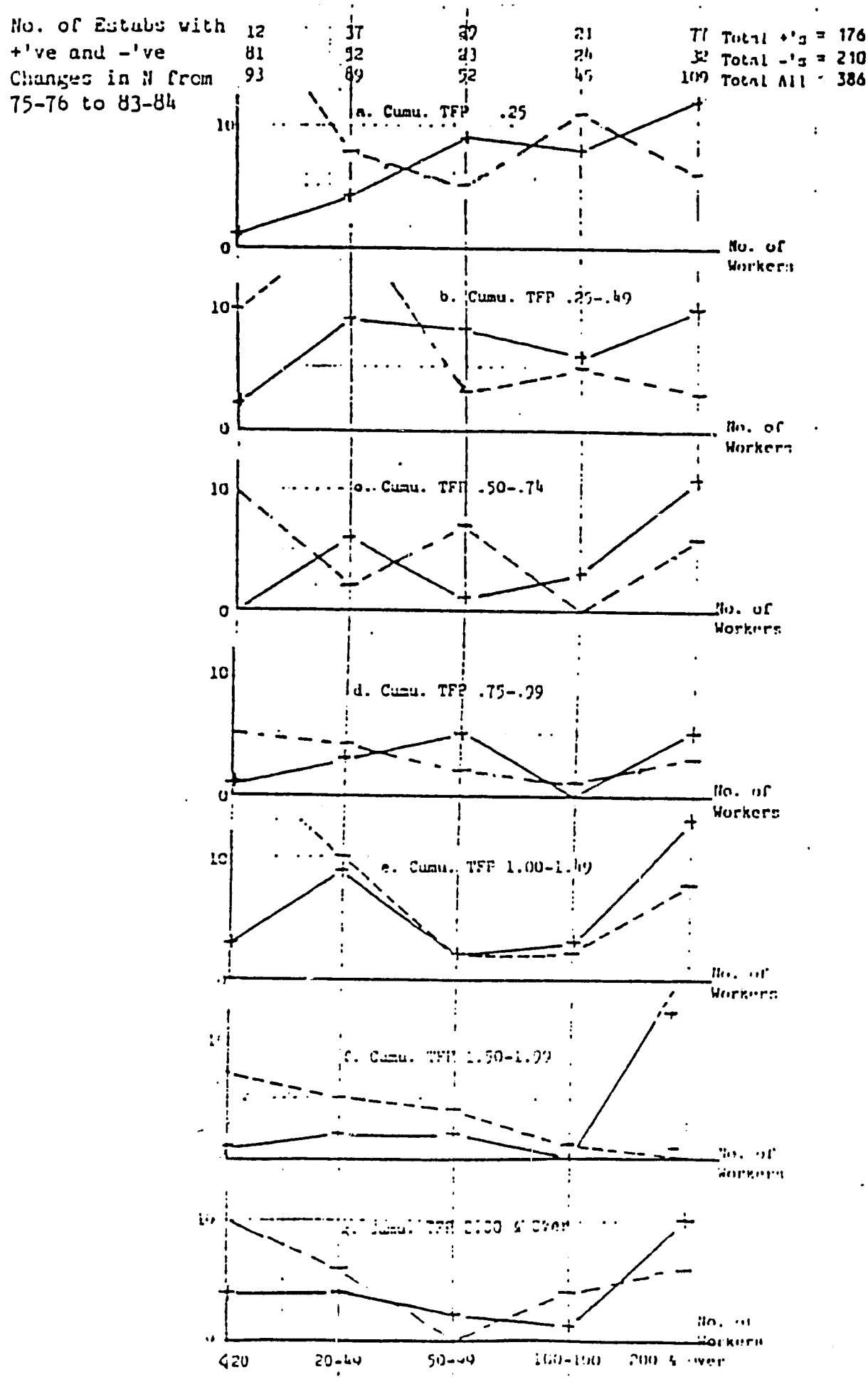

Figure 3.2.—No. of establishments with positive and negative changes in the number of workers from 1975-76 to 1983-84 by size classes of workers, Old Enterprises, CMI.

Source: Table 3.3

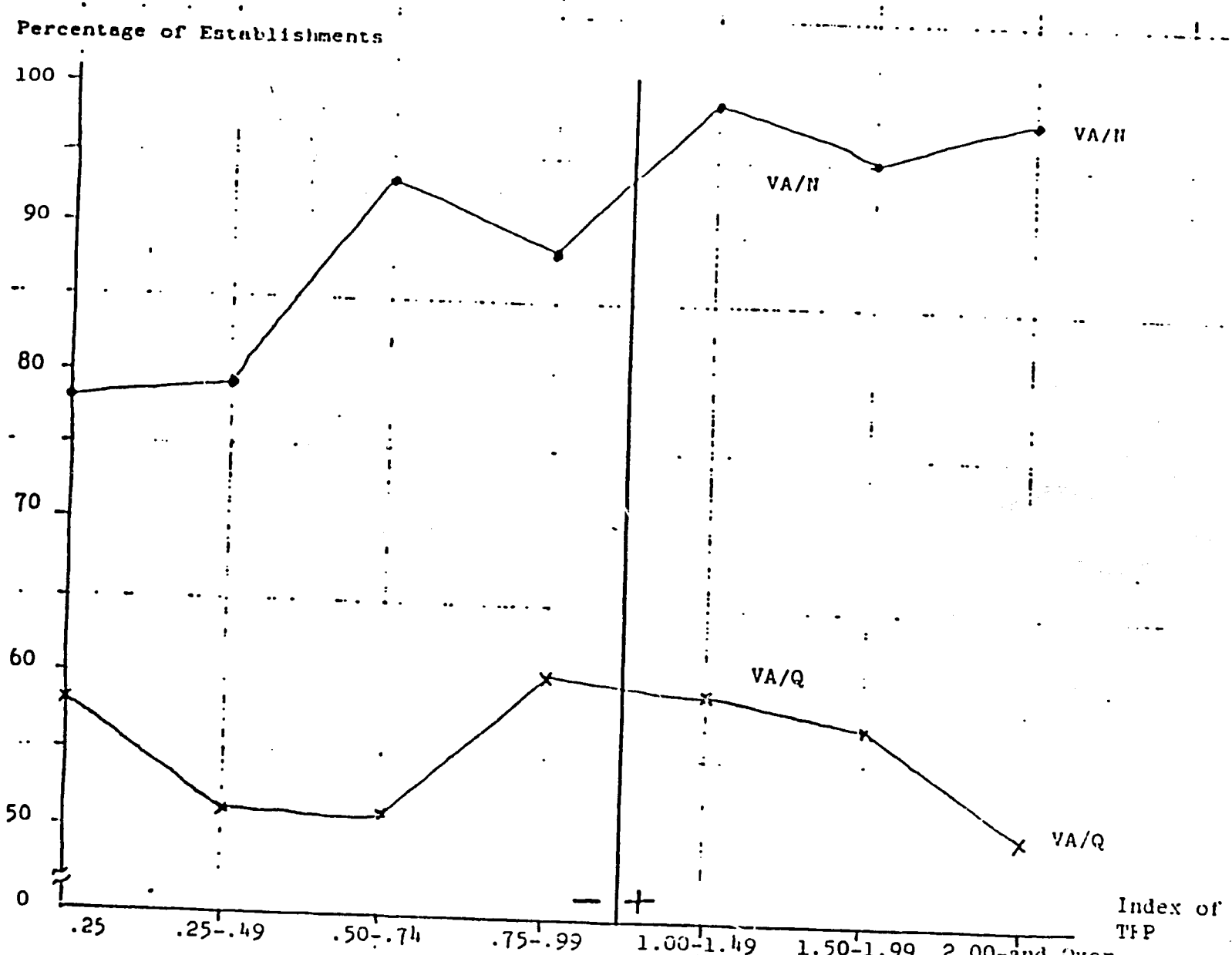

Fig. 3.3.--Percentage of establishments with positive signs to total establishments of changes in VA/Q and VA/N from 1975-76 to 1983-84, "old" enterprises, CMI

Source:- Table 3.4.

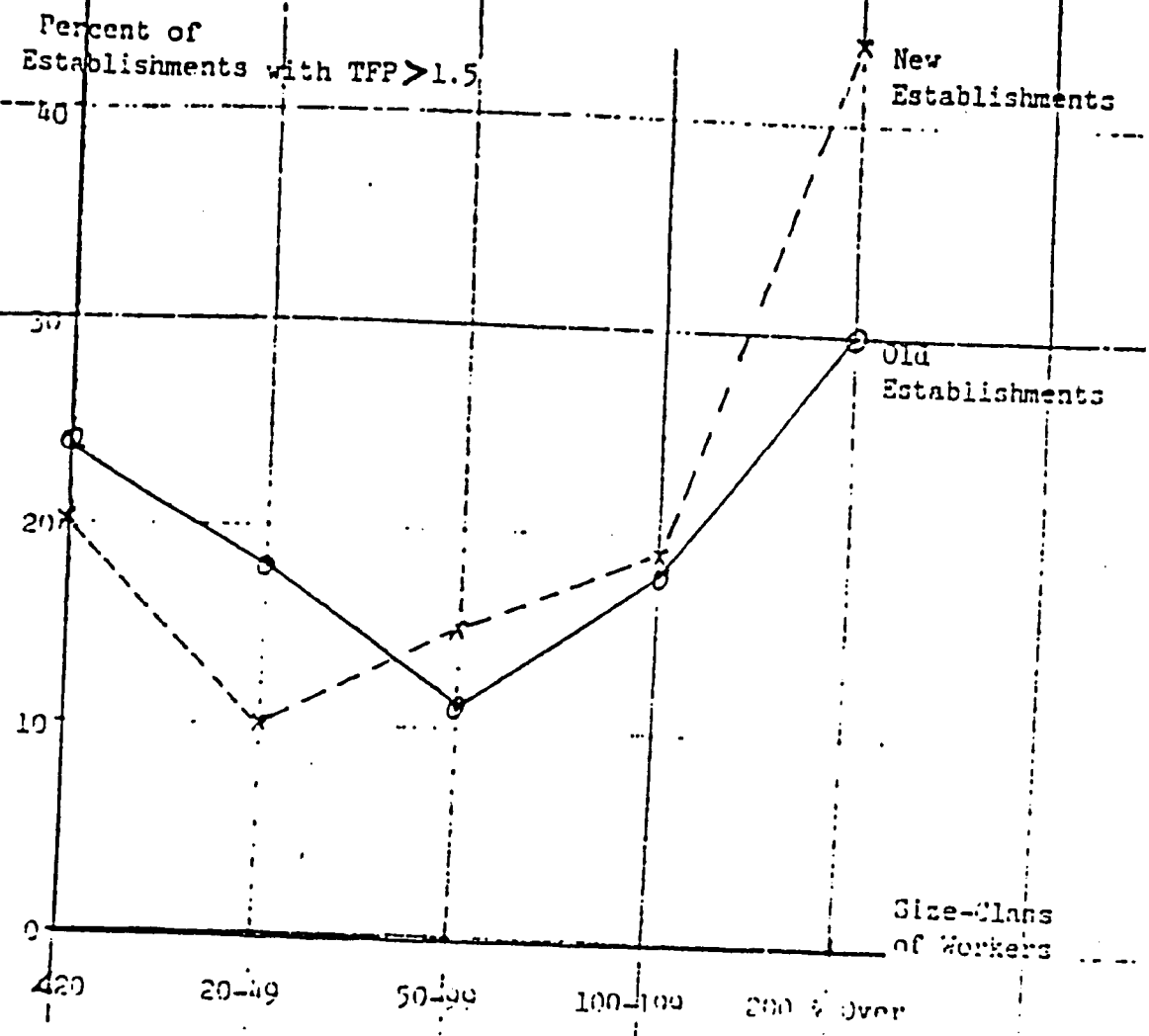

Fig. 3.4a.—Percentage of establishments which attained a cumulated TFP index of 1.50 or over, cumulated, by size-class, CMI: old and new samples.

Source: Tables 3.2 and 3.6, last line.

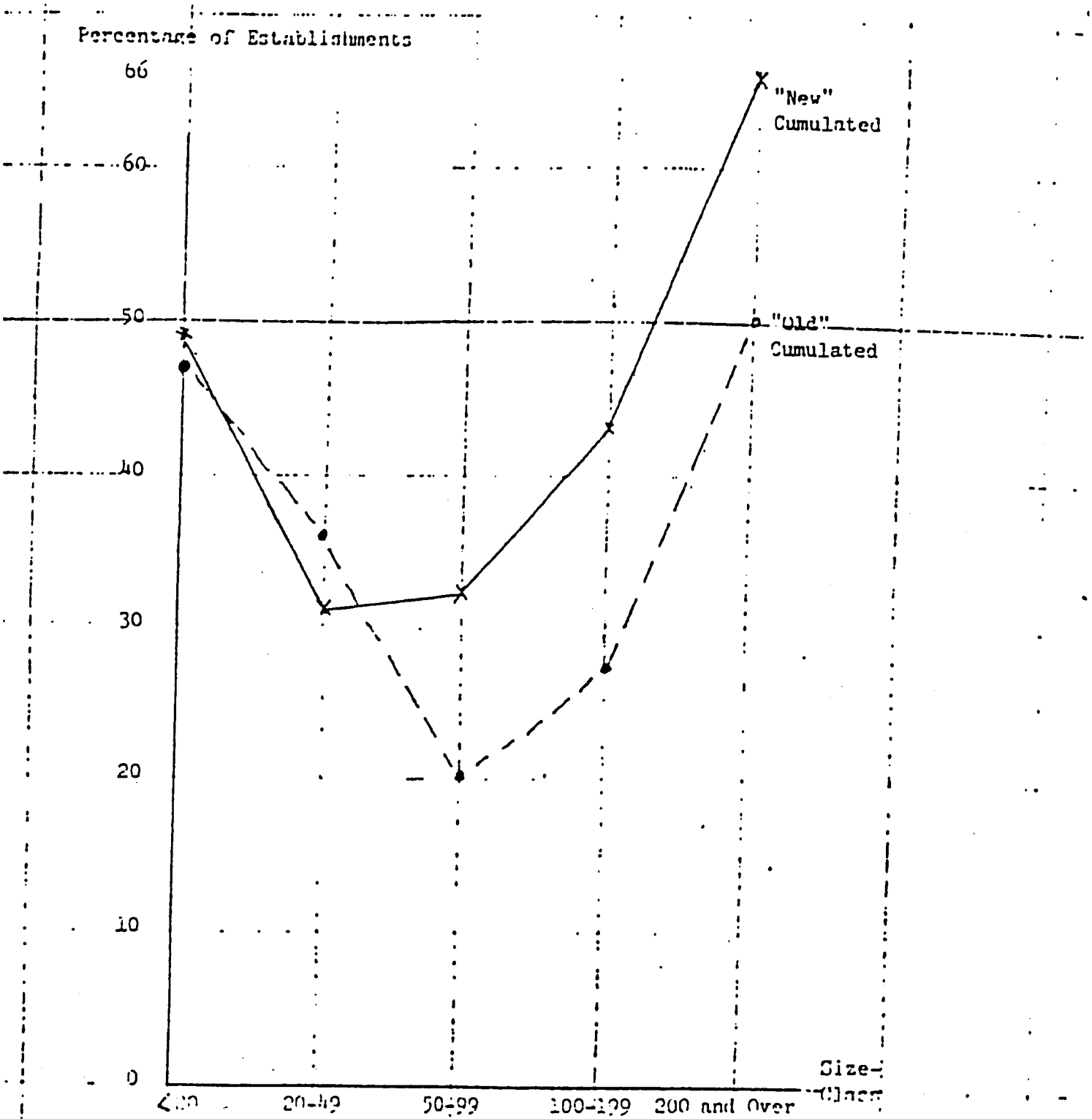

Fig. 3.4b.--Percentage of establishments which attained a cumulated TFP index of 1.00 or higher, cumulated to 1983-84, by size-class, CMI: old and new samples.

Source: Tables 3.2 and 3.6.

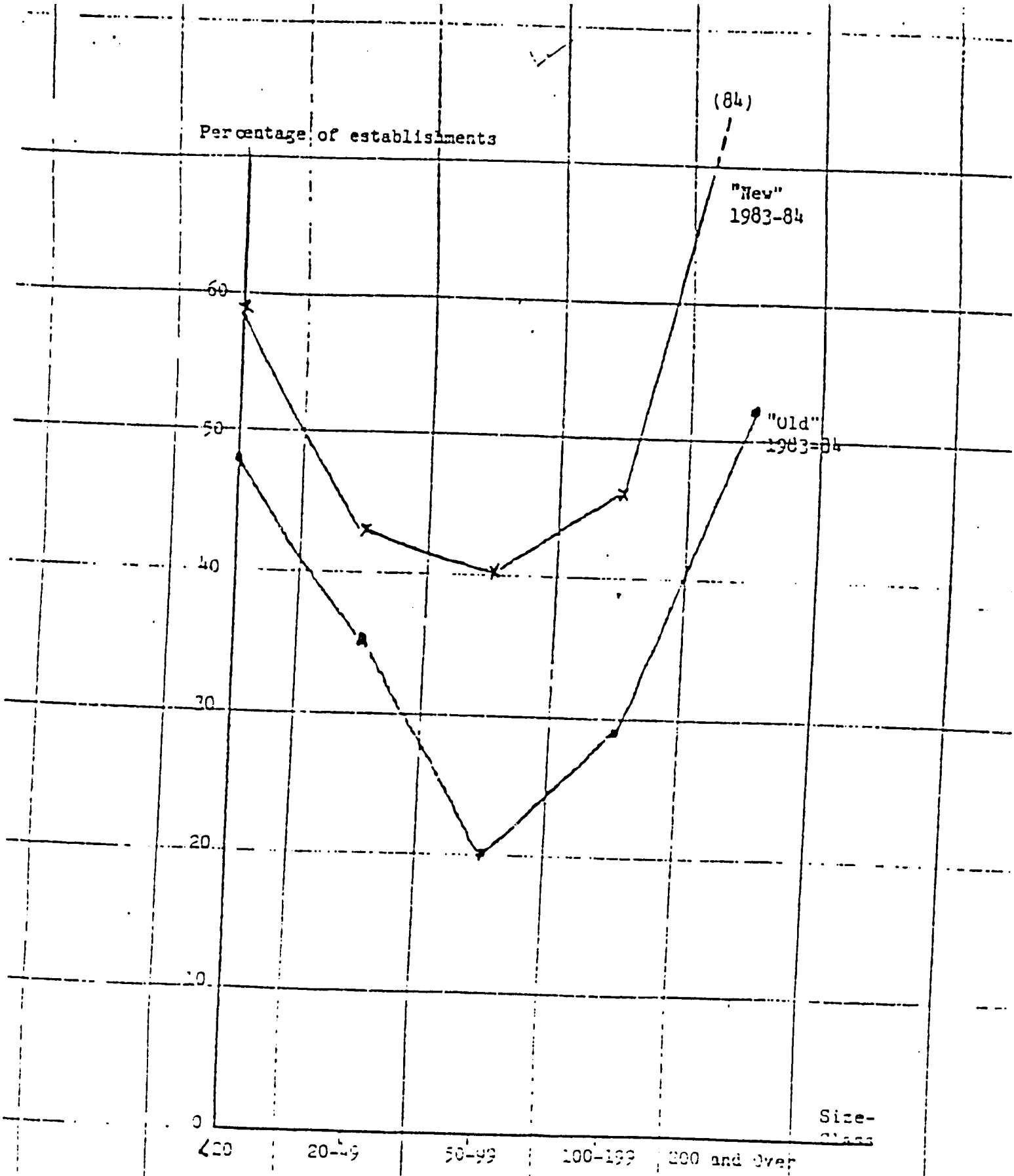

Fig. 3.4c.--Percentage of establishments which attained a TFP index of 1.30 or higher in 1983-84, by size-class, CMI: old and new samples.

Source: Table 3.2 and 3.6.

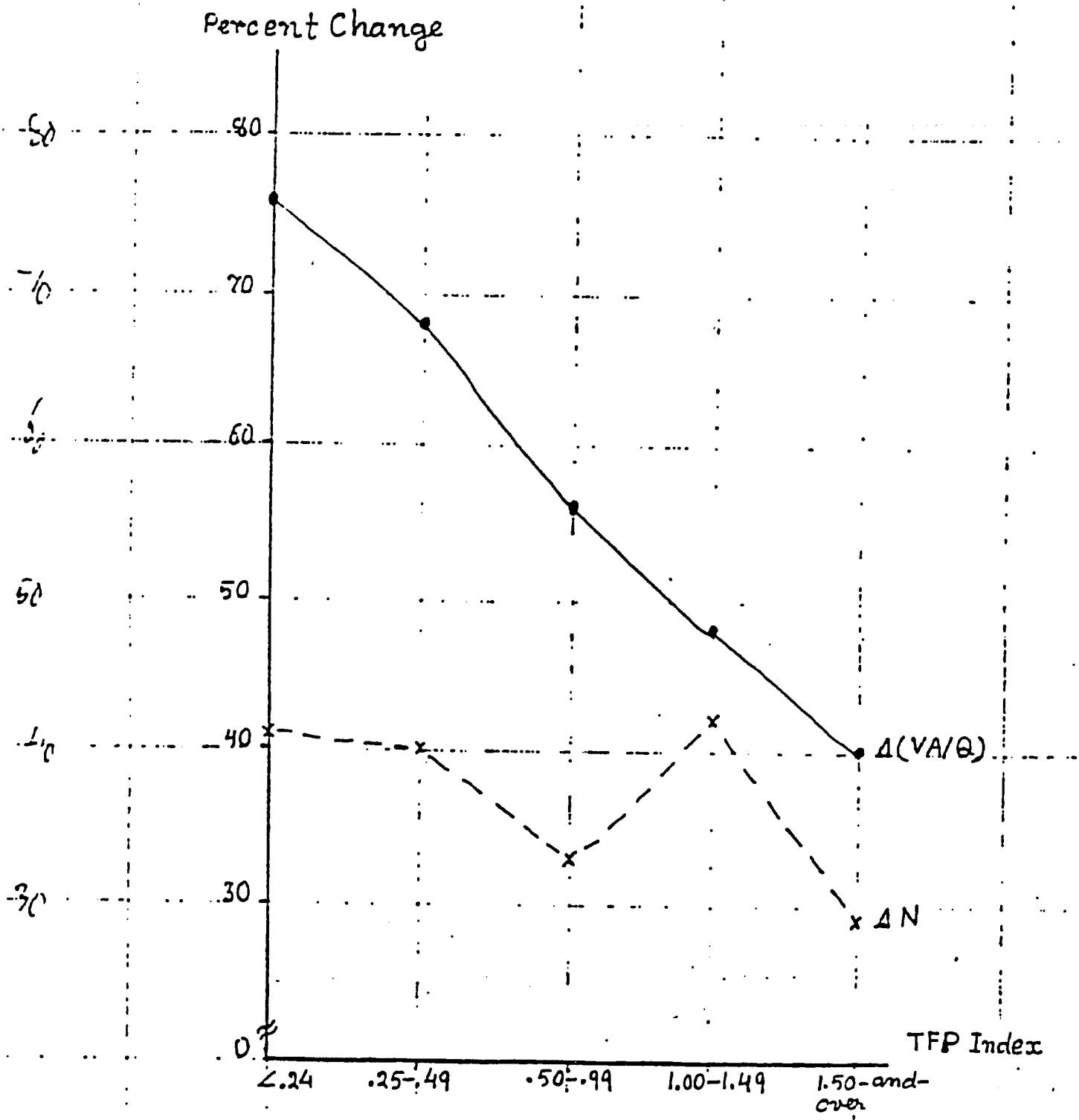

Fig. 3.4d.—Percentage changes in VA/Q and N with respect to cumulated TFP, CMI: "New" sample.

Source: Table 3.6.

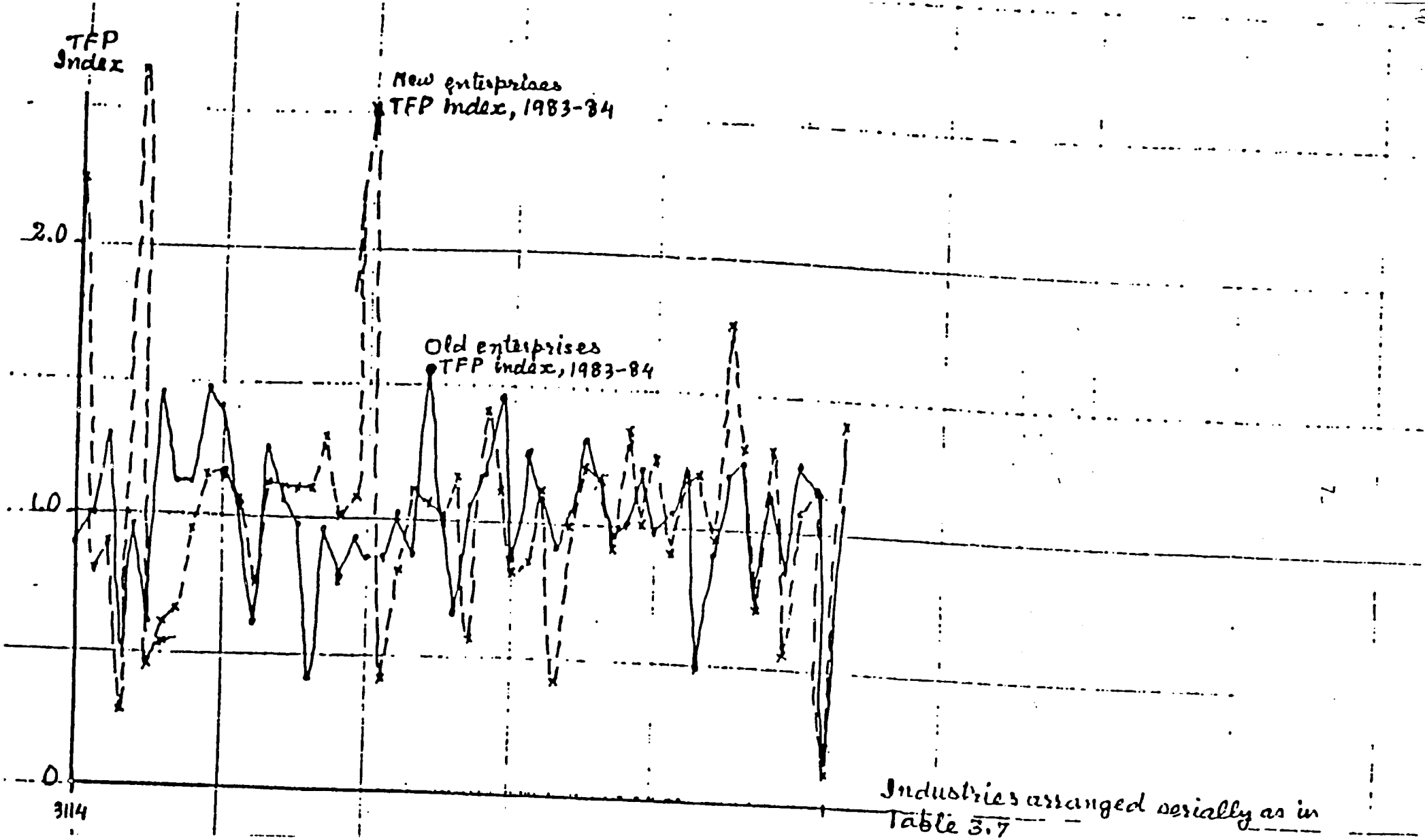

Fig. 3.5.--TFP in 1983-84 in old and new establishments aggregated at the 4-digit industry level.

Source: Table 3.7.

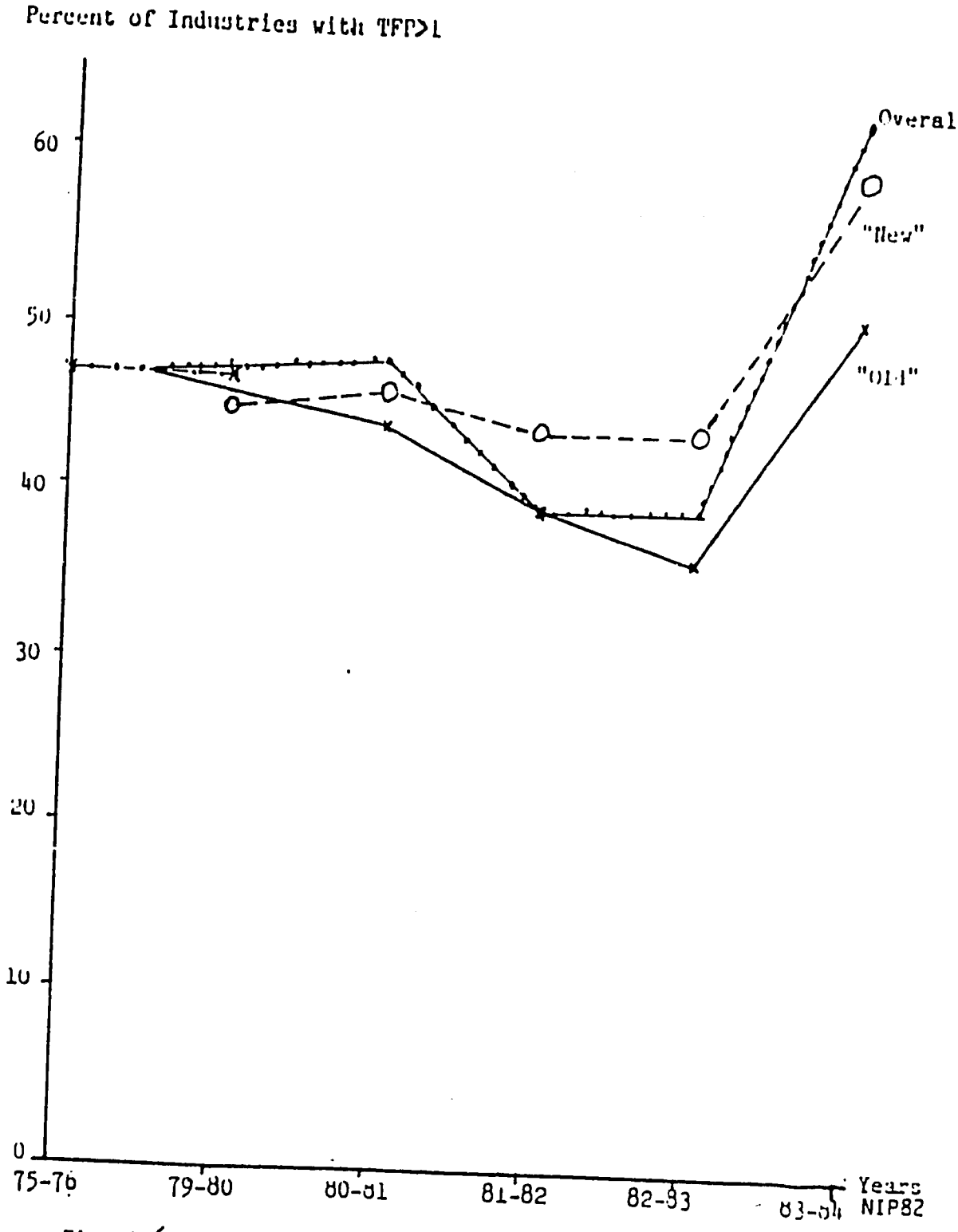

Fig. 3.6.--Percentage of industries which experienced TFP > 1 by year, CMI: different samples.[a]

[a]The overall measure includes the establishments of the "moribund" sample.

Source: Table 3.8 a.

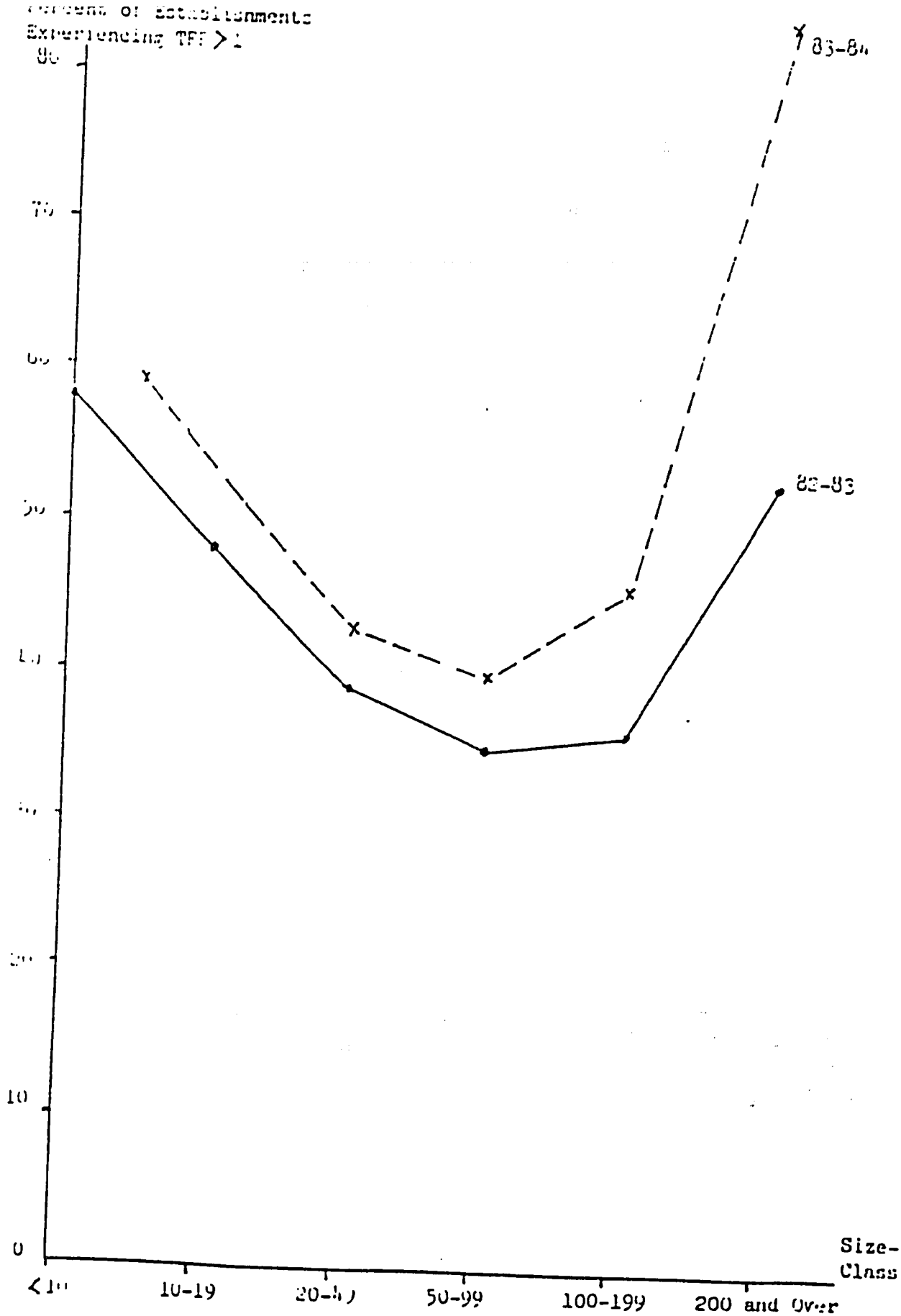

Fig. 3.7.—Percent of establishments experiencing TFP 1, pre- and post-NIP82 periods, CMI: "new" establishments.

Source: Table 3.8b.

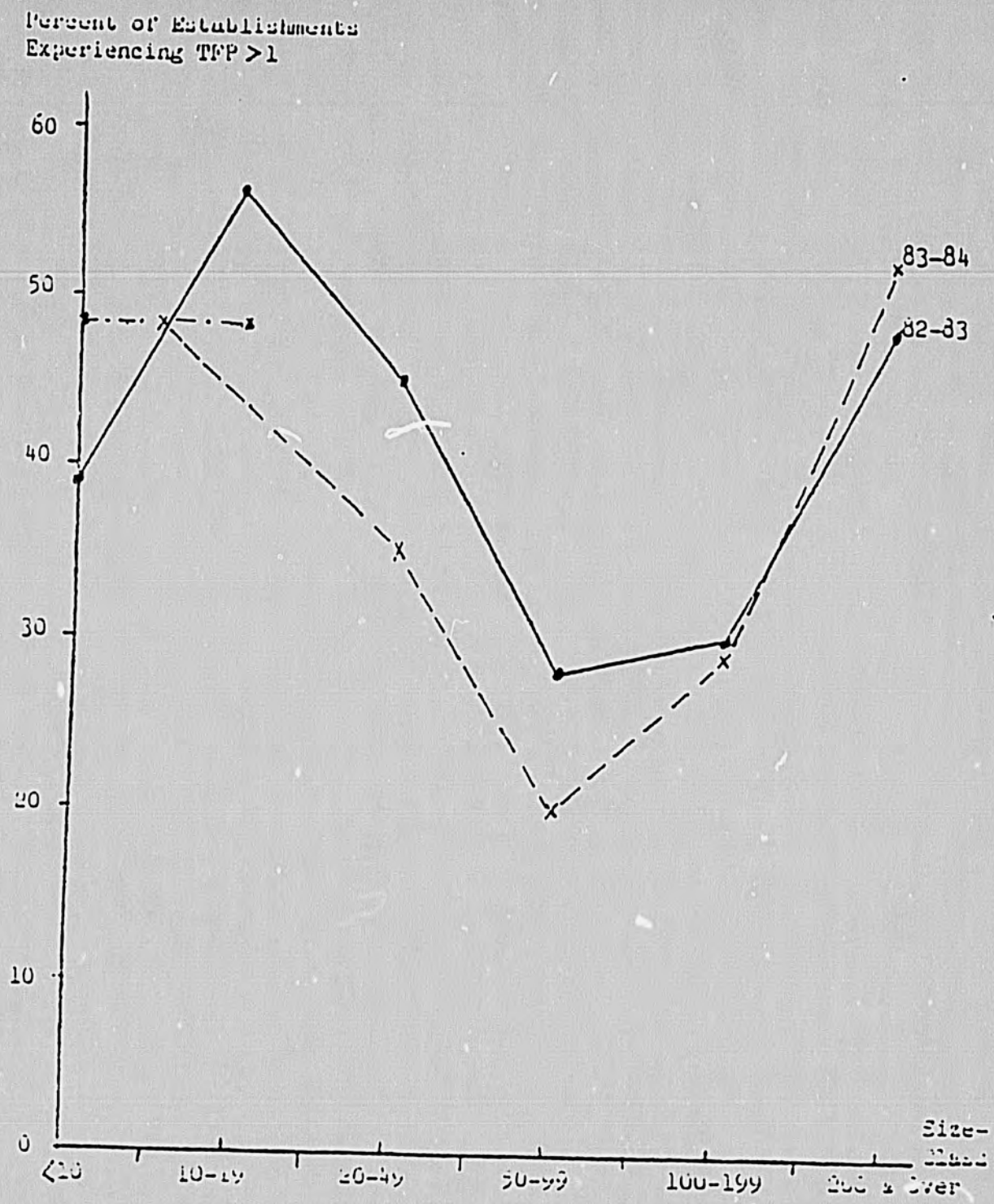

Fig. 3.3.--Percent of establishments experiencing TFP >1, pre- and post-HIPPS periods, CMI data: "old" establishments.

Source: Table 3.3 b.

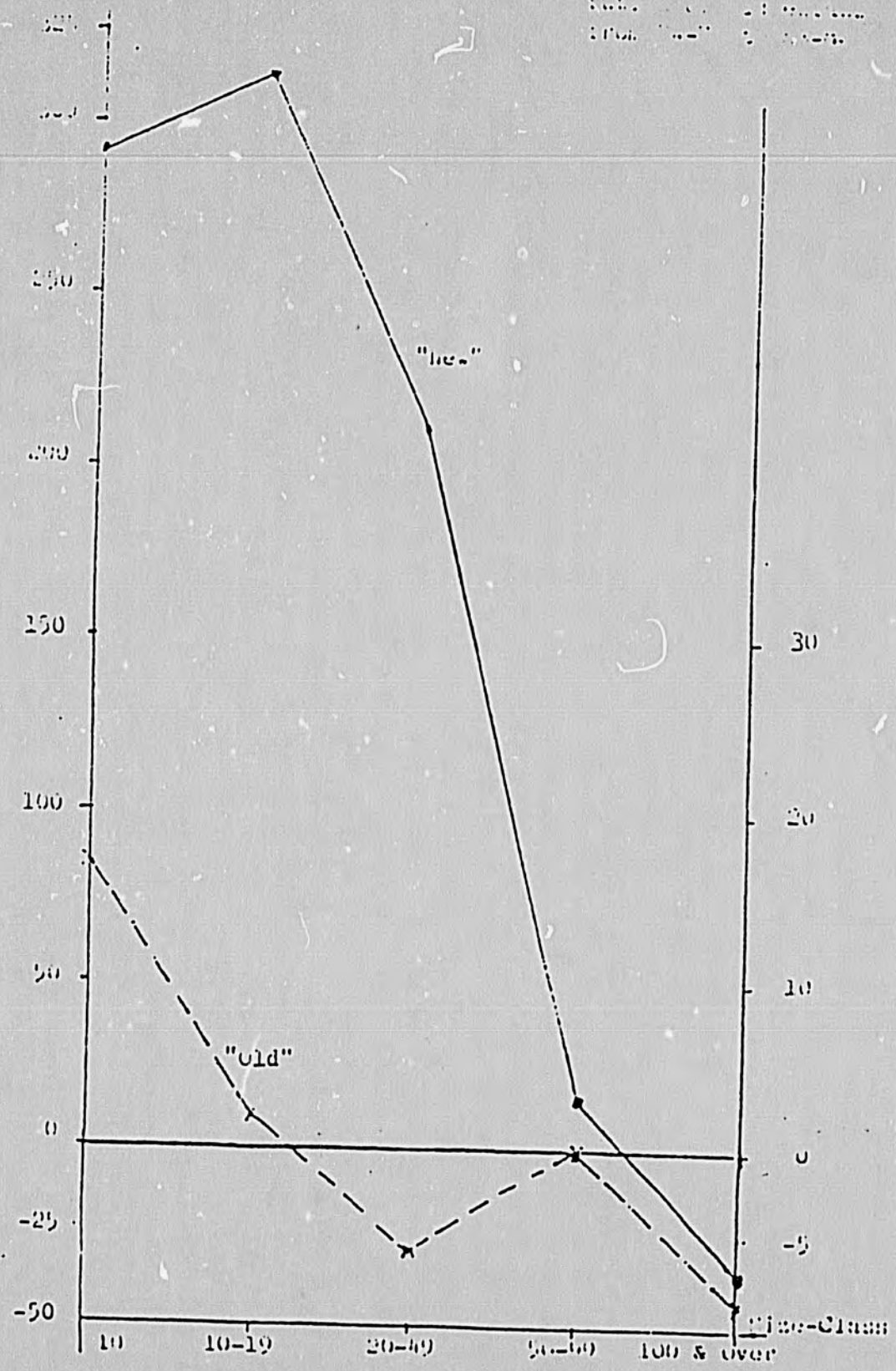

Fig. 3.9.—Percent changes in the distribution of "old" establishments and "new" entrants between the 1970s and the 1980s, CMI

Source: Calculated from Tables 3.9 and 3.10, last panel.

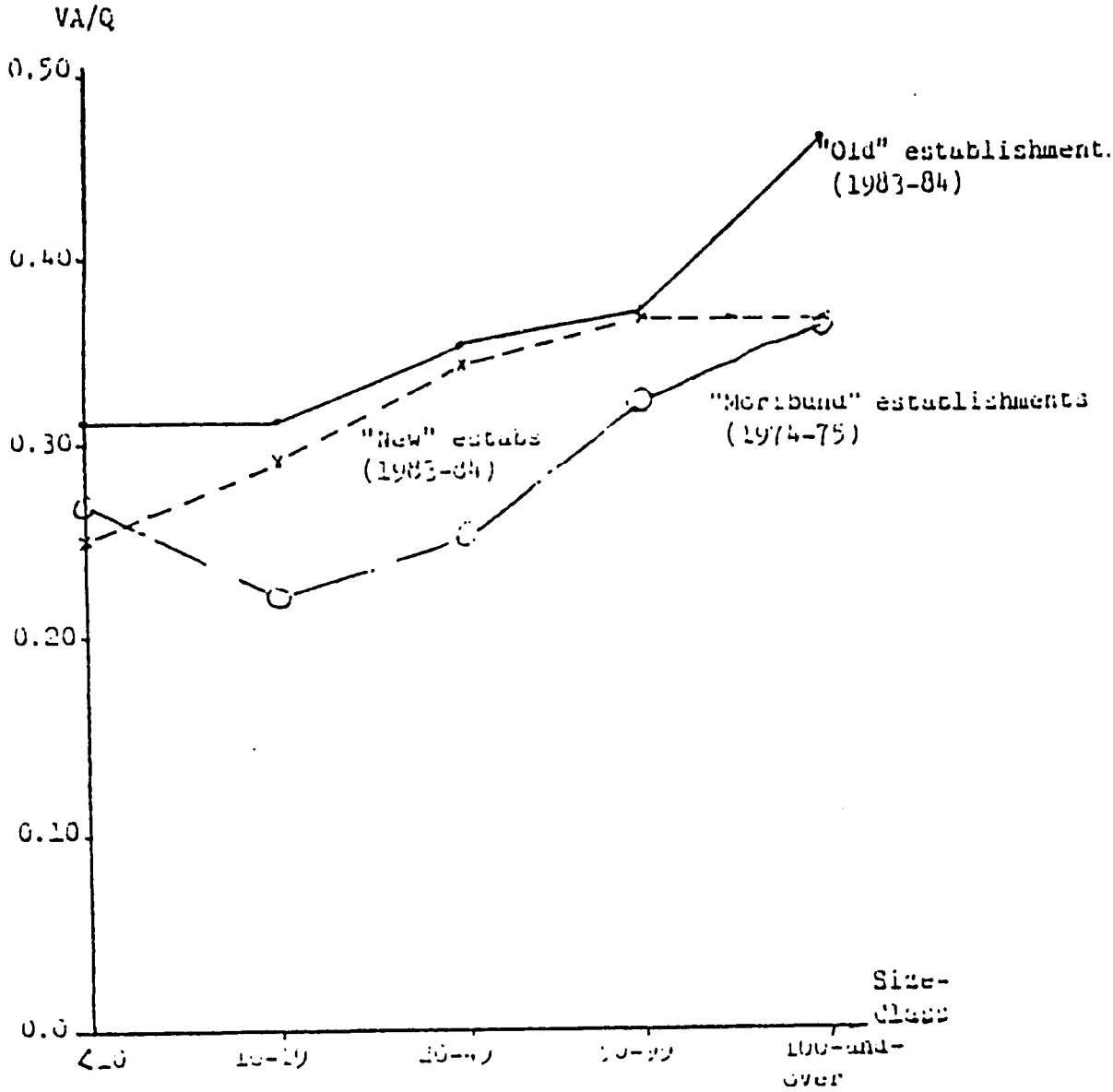

Fig. 3.10.--Mean VA/Q by size-class of workers, "old," "new," and "moribund establishments.

Source: Table 3.12.

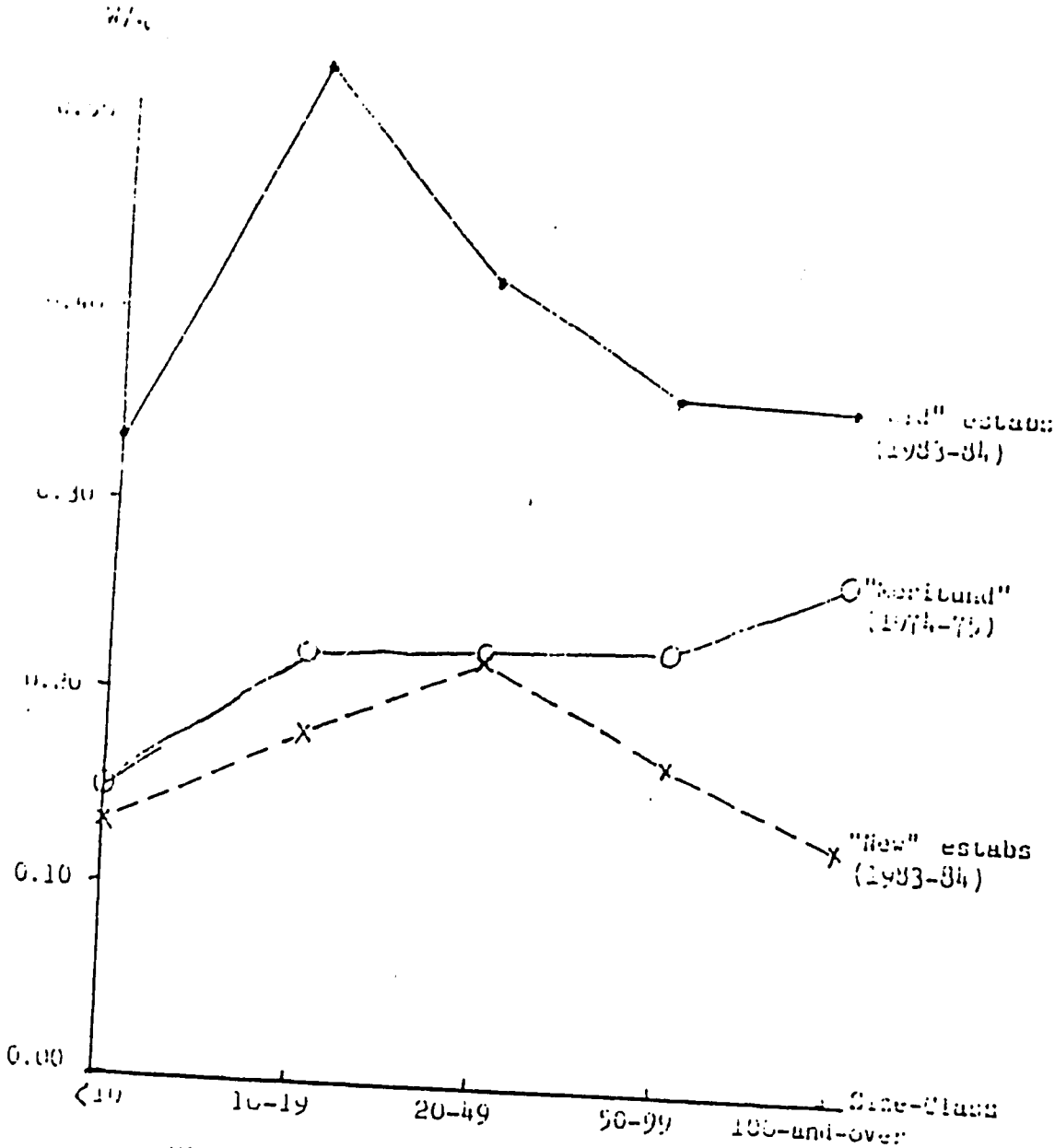

Fig. 3.11.--Mean W/Q by size-class of workers, "old," "new," and "moribund" establishments.

Source: Table 3.12.

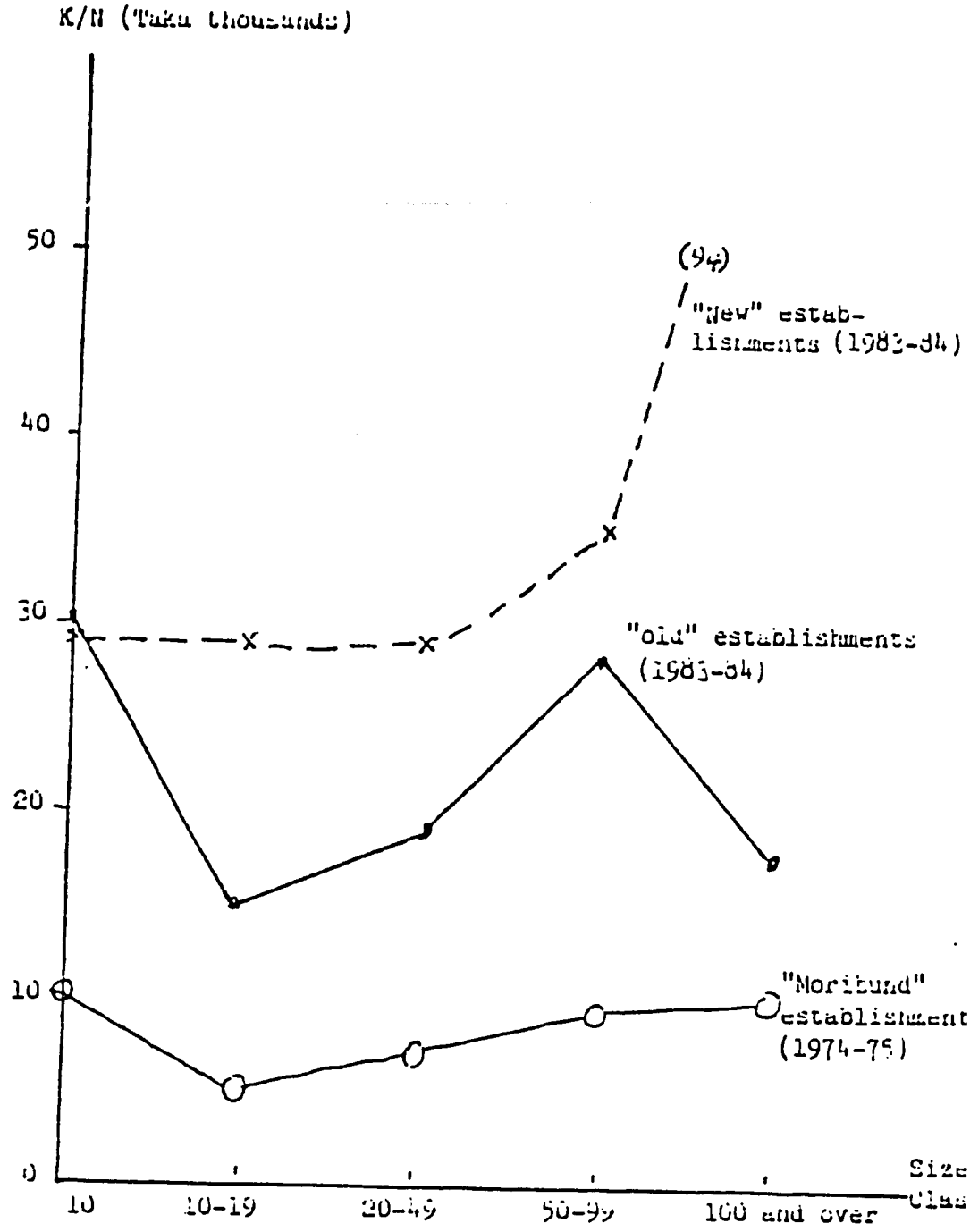

Fig. 3.12.--Mean K/N by size-class of workers, "old," "new," and "moribund" establishments.

Source: Table 3.12.

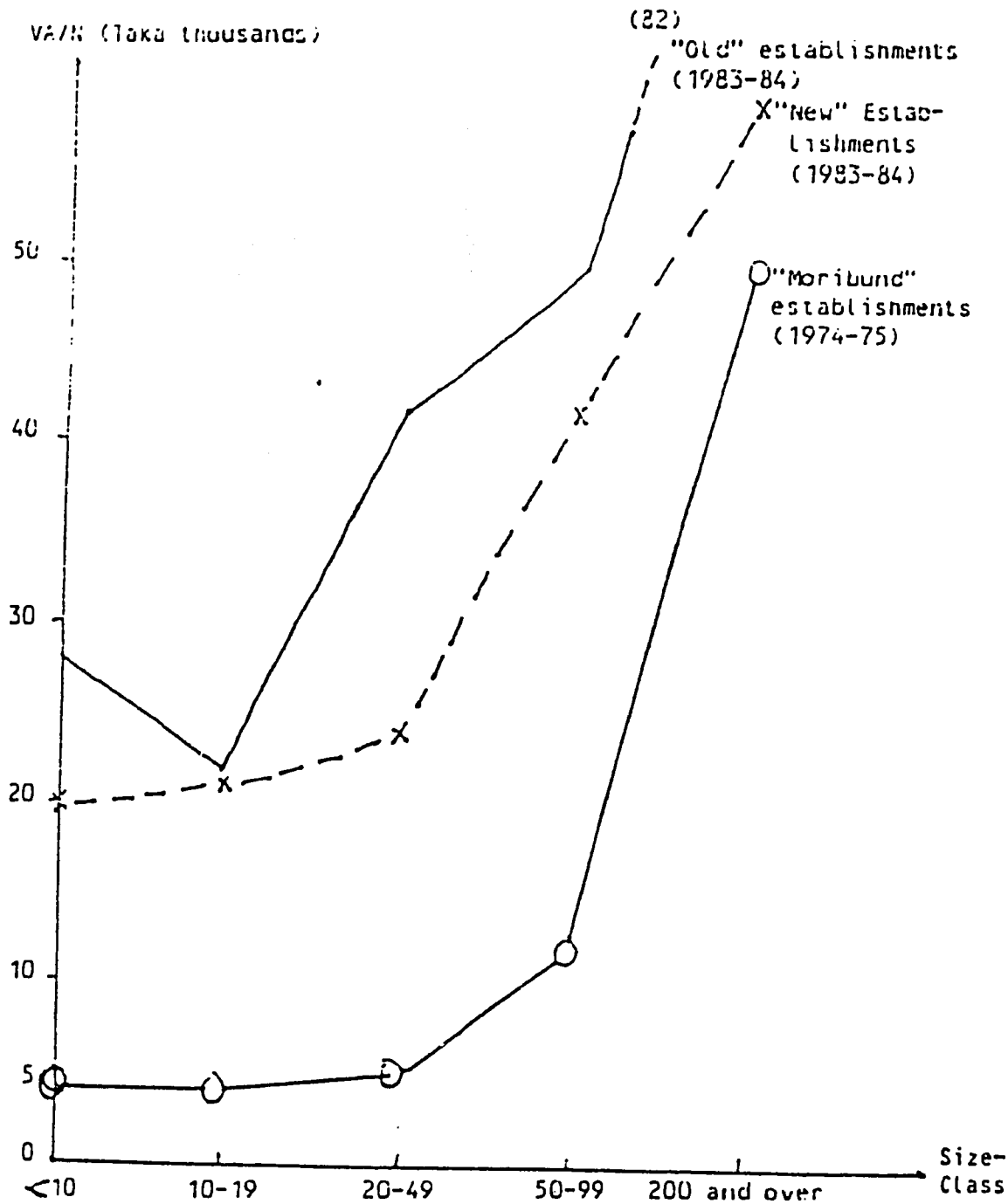

Fig. 3.13.--Mean VA/N by size-class of workers, "old," "new," and "moribund" establishments.

Source: Table 3.12.

APPNDIX 3A

CENSUS OF MANUFACTURING INDUSTRIES, BANGLADESH

MICRODATA MERGE FILE, 1974-5--1983-4

DOCUMENTATION

OF

VARIABLE RECORDS

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PLANNING COMMISSION

Census of Manufacturing Industries, Bangladesh

Microdata Merge File, 1974-5--1983-4

DOCUMENTATION

of

Variable Records

(C) HIID, June 1988

Contains establishment data with major product and three major raw material names, variable names, variable locations, for the period from 1974-75 through 1983-84, except years 1976-77 through 1978-79. There are 30 (original + transformed) variables, including 3 price-index variables injected from outside the CMI data, 3 codes for the 3 samples, and several other codes. In addition to raw variables, several computed values are also recorded for ready manouverability, including 19 ratios of different costs to output value, total factor productivity, etc. There are 373 "old" estabs (each for 7 years), 1087 "new" estabs (each for a maximum of 5 years), and 136 "moribund" estabs (each for a maximum of 6 years). The first part of this write-up consists of variable locations, the second part variable definitions.

```
00077   0077                15  K-PRIME-BY-O                    PIC 9(8)V9999.
00078   0078                15  K-PRIME-BY-N                    PIC 9(9).
00079   0079                15  K-PRIME-BY-N1                   PIC 9(9).
00080   0080                15  K-PRIME-BY-N2                   PIC 9(9).
00081   0081                15  N2-BY-N1                        PIC 9999V9999.
00082   0082                15  TOT-EMP-N                       PIC 9(8).
00083   0083                15  OPER-EMPL-N1                    PIC 9(8).
00084   0084                15  ADMN-EMPL-N2                    PIC 9(8).
00085   0085                15  OTHR-EMPL-N3                    PIC 9(8).
00086   0086                15  WORKING-PROP-N4                 PIC 9(9).
00087   0087                15  UNPAID-HLLPR-N5                 PIC 9(9).
00088   0088                15  CONTRACT-LAB-N6                 PIC 9(9).
00089   0089                15  OPER-WAGE-RATE-W1               PIC 9(6)V99.
00090   0090                15  ADMIN-WAGE-RATE-W2              PIC 9(6)V99.
00091   0091                15  TOT-WAGE-BILL-W                 PIC 9(8).
00092   0092            10  O-OLD-DATA.
00093   0093                15  O-OLD-E                         PIC 9999.
00094   0094                15  O-OLD-O                         PIC 9(12).
00095   0095                15  O-OLD-N                         PIC 9(12).
00096   0096            10  O-NEW-DATA.
00097   0097                15  O-NEW-E                         PIC 9999.
00098   0098                15  O-NEW-O                         PIC 9(12).
00099   0099                15  O-NEW-N                         PIC 9(12).
00100   0100            10  O-MOR-DATA.
00101   0101                15  O-MOR-E                         PIC 9999.
00102   0102                15  O-MOR-O                         PIC 9(12).
00103   0103                15  O-MOR-N                         PIC 9(12).
00104   0104        05  FILLER                                  PIC X(5).
00105   0105
00106   0106    FD  OUT-FILE
00107   0107        RECORDING MODE IS F
00108   0108        LABEL RECORDS ARE STANDARD
00109   0109        RECORD CONTAINS 696 CHARACTERS
00110   0110        DATA RECORD IS OUT-REC.
00111   0111    01  OUT-REC.
00112   0112        05  PART-I.
00113   0113            10  SL-NO-O
00114   0114            10  SAMPLE-TYPE-C                       PIC 9999.
00115   0115                88  OLD                             PIC 9.
00116   0116                88  NEW                             VALUE 1.
00117   0117                88  MORIBUND                        VALUE 2.
00118   0118            10  INDUSTRY-O.                         VALUE 3.
00119   0119                15  O-IND-1
00120   0120                15  O-IND-2                         PIC 9.
00121   0121                15  O-IND-MINOR                     PIC 9.
00122   0122            10  YEAR-O                              PIC 99.
00123   0123            10  REST-DATA-O.                        PIC 99.
00124   0124                15  YEAR-NO-O
00125   0125                15  PRODUCT-NAME-O                  PIC 99.
00126   0126                15  PROD-UNIT-NAME-O                PIC X(30).
00127   0127                15  PROD-UNIT-PRICE-PR1-O           PIC X(7).
00128   0128                15  INPUT-NAME-1-O                  PIC 9(8)V9999.
00129   0129                15  INP-UNIT-NAME-1-O               PIC X(30).
00130   0130                15  INP-UNIT-PRICE-PR1-O            PIC X(7).
00131   0131                15  INPUT-NAME-2-O                  PIC 9(8)V9999.
00132   0132                15  INP-UNIT-NAME-2-O               PIC X(30).
00133   0133                15  INP-UNIT-PRICE-PR2-O            PIC X(7).
00134   0134                15  INPUT-NAME-3-O                  PIC 9(8)V9999.
00135   0135                15  INP-UNIT-NAME-3-O               PIC X(30).
00136   0136                15  INP-UNIT-PRICE-PR3-O            PIC X(7).
00137   0137                15  OUTPUT-VALUE-O                  PIC 9(8)V9999.
00138   0138                15  VALUE-ADDED-VA-O                PIC 9(10).
00139   0139                15  CAPITAL-STOCK-K-O               PIC S9(9).
00140   0140                15  NON-WAGES-NW-O                  PIC 9(10).
00141   0141                15  V1-O                            PIC 9(10).
00142   0142                15  V2-O                            PIC 9(5)V9999.
00143   0143                15  V3-O                            PIC 9(5)V9999.
00144   0144                15  V4-O                            PIC 9(5)V9999.
00145   0145                15  V5-O                            PIC 9(5)V9999.
00146   0146                15  V6-O                            PIC 9(5)V9999.
00147   0147                15  V7-O                            PIC 9(5)V9999.
00148   0148                15  V8-O                            PIC 9(5)V9999.
00149   0149                15  V9-O                            PIC 9(5)V9999.
00150   0150                15  V10-O                           PIC 9(5)V9999.
00151   0151                15  V11-O                           PIC 9(5)V9999.
00152   0152                15  V12-O                           PIC 9(5)V9999.
00153   0153                15  V13-O                           PIC 9(5)V9999.
```

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CBL STATE,FLOW
00001    0001    ID DIVISION.
00002    0002    PROGRAM-ID.     HIDC261F.
00003    0003    DATE-WRITTEN.   15/06/88.
00004    0004    DATE-COMPILED.  16/06/88
00005    0005    REMARKS. IT ADDS GDP-DEFLATOR, PRODUCTION PRICE INDEX, AND
00006    0006             RAW-MATERIAL PRICE INDEX (BY TWO DIGIT MAJOR INDUSTR
00007    0007             LEVEL AND YEAR) TO EACH ESTABLISHMENT.
00008    0008
00009    0009    ENVIRONMENT DIVISION.
00010    0010    INPUT-OUTPUT SECTION.
00011    0011    FILE-CONTROL.
00012    0012        SELECT EON-FILE    ASSIGN TO SYS081-UT-3420-S-EON.
00013    0013        SELECT OUT-FILE    ASSIGN TO SYS080-UT-3420-S-OTFIL.
00014    0014  * INPUT FILE T-6010, OUTPUT FILE T-2116
00015    0015
00016    0016    DATA DIVISION.
00017    0017    FILE SECTION.
00018    0018    FD  EON-FILE
00019    0019        RECORDING MODE IS F
00020    0020        LABEL RECORDS ARE STANDARD
00021    0021        RECORD CONTAINS 688 CHARACTERS
00022    0022        DATA RECORD IS EON-REC.
00023    0023    01  EON-REC.
00024    0024        05  FIRST-PART.
00025    0025            10  SL-NO                          PIC 9999.
00026    0026            10  SAMPLE-TYPE                    PIC 9.
00027    0027                88  OLD                        VALUE 1.
00028    0028                88  NEW                        VALUE 2.
00029    0029                88  MORIBUND                   VALUE 3.
00030    0030            10  INDUSTRY.
00031    0031                15  IND-1                      PIC 9.
00032    0032                15  IND-2                      PIC 9.
00033    0033                15  IND-MINOR                  PIC 99.
00034    0034            10  YEAR                           PIC 99.
00035    0035            10  REST-DATA.
00036    0036                15  YEAR-NO                    PIC 99.
00037    0037                15  PRODUCT-NAME               PIC X(30).
00038    0038                15  PROD-UNIT-NAME             PIC X(7).
00039    0039                15  PROD-UNIT-PRICE-P1         PIC 9(8)V9999.
00040    0040                15  INPUT-NAME-1               PIC X(30).
00041    0041                15  INP-UNIT-NAME-1            PIC X(7).
00042    0042                15  INP-UNIT-PRICE-PR1         PIC 9(8)V9999.
00043    0043                15  INPUT-NAME-2               PIC X(30).
00044    0044                15  INP-UNIT-NAME-2            PIC X(7).
00045    0045                15  INP-UNIT-PRICE-PR2         PIC 9(8)V9999.
00046    0046                15  INPUT-NAME-3               PIC X(30).
00047    0047                15  INP-UNIT-NAME-3            PIC X(7).
00048    0048                15  INP-UNIT-PRICE-PR3         PIC 9(8)V9999.
00049    0049                15  OUTPUT-VALUE-O             PIC 9(10).
00050    0050                15  VALUE-ADDED-VA             PIC S9(9).
00051    0051                15  CAPITAL-STOCK-K            PIC 9(10).
00052    0052                15  NON-WAGES-NW               PIC 9(10).
00053    0053                15  V1                         PIC 9(5)V9999.
00054    0054                15  V2                         PIC 9(5)V9999.
00055    0055                15  V3                         PIC 9(5)V9999.
00056    0056                15  V4                         PIC 9(5)V9999.
00057    0057                15  V5                         PIC 9(5)V9999.
00058    0058                15  V6                         PIC 9(5)V9999.
00059    0059                15  V7                         PIC 9(5)V9999.
00060    0060                15  V8                         PIC 9(5)V9999.
00061    0061                15  V9                         PIC 9(5)V9999.
00062    0062                15  V10                        PIC 9(5)V9999.
00063    0063                15  V11                        PIC 9(5)V9999.
00064    0064                15  V12                        PIC 9(5)V9999.
00065    0065                15  V13                        PIC 9(5)V9999.
00066    0066                15  V14                        PIC 9(5)V9999.
00067    0067                15  V15                        PIC 9(5)V9999.
00068    0068                15  V16                        PIC 9(5)V9999.
00069    0069                15  V17                        PIC 9(5)V9999.
00070    0070                15  V18                        PIC 9(5)V9999.
00071    0071                15  V19                        PIC 9(5)V9999.
00072    0072                15  F-PRODUCTIVITY             PIC 9(5)V9999.
00073    0073                15  K-PRIME                    PIC 9(8)V9999.
00074    0074                15  O-BY-N                     PIC 9(8)V9999.
00075    0075                15  VA-BY-K-PRIME              PIC 9999V999999.
00076    0076                15  VA-BY-N                    PIC 9(5)V99.
```

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00154   0154                15  V14-C                          PIC 9(5)V9999.
00155   0155                15  V15-C                          PIC 9(5)V9999.
00156   0156                15  V16-C                          PIC 9(5)V9999.
00157   0157                15  V17-C                          PIC 9(5)V9999.
00158   0158                15  V18-C                          PIC 9(5)V9999.
00159   0159                15  V19-C                          PIC 9(5)V9999.
00160   0160                15  F-PRODUCTIVITY-C               PIC 9(5)V9999.
00161   0161                15  K-PRIME-C                      PIC 9(8)V9999.
00162   0162                15  Q-BY-N-C                       PIC 9(8)V9999.
00163   0163                15  VA-BY-K-PRIME-C                PIC 9999V999999.
00164   0164                15  VA-BY-N-C                      PIC 9(5)V99.
00165   0165                15  K-PRIME-BY-Q-C                 PIC 9(8)V9999.
00166   0166                15  K-PRIME-BY-N-C                 PIC 9(9).
00167   0167                15  K-PRIME-BY-N1-C                PIC 9(9).
00168   0168                15  K-PRIME-BY-N2-C                PIC 9(9).
00169   0169                15  N2-BY-N1-C                     PIC 9999V9999.
00170   0170                15  TOT-EMP-N-C                    PIC 9(8).
00171   0171                15  OPER-EMPL-N1-C                 PIC 9(8).
00172   0172                15  ADMN-EMPL-N2-C                 PIC 9(8).
00173   0173                15  OTHR-EMPL-N3-C                 PIC 9(8).
00174   0174                15  WORKING-PROP-N4-C              PIC 9(9).
00175   0175                15  UNPAID-HELPR-N5-C              PIC 9(9).
00176   0176                15  CONTRACT-LAB-N6-C              PIC 9(9).
00177   0177                15  OPER-WAGE-RATE-W1-C            PIC 9(6)V99.
00178   0178                15  ADMIN-WAGE-RATE-W2-C           PIC 9(6)V99.
00179   0179                15  TOT-WAGE-BILL-W-C              PIC 9(8).
00180   0180            10  OUT-OLD-DATA.
00181   0181                15  O-OLD-ESTB-E                   PIC 9999.
00182   0182                15  O-OLD-OUTPUT-Q                 PIC 9(12).
00183   0183                15  O-OLD-WORKER-N                 PIC 9(12).
00184   0184            10  OUT-NEW-DATA.
00185   0185                15  O-NEW-ESTB-E                   PIC 9999.
00186   0186                15  O-NEW-OUTPUT-Q                 PIC 9(12).
00187   0187                15  O-NEW-WORKER-N                 PIC 9(12).
00188   0188            10  OUT-MOR-DATA.
00189   0189                15  O-MOR-ESTB-E                   PIC 9999.
00190   0190                15  O-MOR-OUTPUT-Q                 PIC 9(12).
00191   0191                15  O-MOR-WORKER-N                 PIC 9(12).
00192   0192        05  GDP-DEFLATOR                           PIC 9999.
00193   0193        05  PROD-P-INDEX                           PIC 9999.
00194   0194        05  RAW-MAT-P-INDEX                        PIC 9999.
00195   0195        05  FILLER                                 PIC X.
00196   0196
00197   0197    WORKING-STORAGE SECTION.
00198   0198    77  WRITE-CTR                          PIC 9(8)   VALUE ZERO.
00199   0199    77  READ-CTR                           PIC 9(8)   VALUE ZERO.
00200   0200    77  YR                                 PIC 99     VALUE ZERO.
00201   0201
00202   0202    01  GDP-INDEX-TAB.
00203   0203        05  GDP-TAB.
00204   0204            10 F PIC X(36) VALUE "015401630108016501260125016501250115"
00205   0205            10 F PIC X(36) VALUE "018002560163017601480194017002020197"
00206   0206            10 F PIC X(36) VALUE "025804570227023803150147019602460370"
00207   0207            10 F PIC X(36) VALUE "028807360273026803880168026302300315"
00208   0208            10 F PIC X(36) VALUE "030508910340030502870235027302620300"
00209   0209            10 F PIC X(36) VALUE "037612300367036003780290028501990281"
00210   0210            10 F PIC X(36) VALUE "040312690370036903900254030402600394"
00211   0211        05  GD-TAB REDEFINES  GDP-TAB.
00212   0212            10  GDTAB OCCURS 7 TIMES.
00213   0213                15  GDP-CELL OCCURS 9 TIMES PIC 9999.
00214   0214
00215   0215    01  PRO-RAW-TAB.
00216   0216        05  PRO-TAB.
00217   0217            10  FILLER    PIC X(8)  VALUE  "02540125".
00218   0218            10  FILLER    PIC X(8)  VALUE  "01650117".
00219   0219            10  FILLER    PIC X(8)  VALUE  "02590179".
00220   0220            10  FILLER    PIC X(8)  VALUE  "03260199".
00221   0221            10  FILLER    PIC X(8)  VALUE  "03870219".
00222   0222            10  FILLER    PIC X(8)  VALUE  "03850243".
00223   0223            10  FILLER    PIC X(8)  VALUE  "04490259".
00224   0224        05  PR-TAB REDEFINES  PRO-TAB.
00225   0225            10  PRTAB OCCURS 7 TIMES.
00226   0226                15  PRO-INDEX     PIC 9999.
00227   0227                15  RAW-INDEX     PIC 9999.
00228   0228
00229   0229    PROCEDURE DIVISION.
00230   0230    START-RUN.
```

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```
00231   0231        OPEN INPUT EON-FILE.
00232   0232            OUTPUT OUT-FILE.
00233   0233        MOVE SPACES TO OUT-REC.
00234   0234
00235   0235    READ-EON.
00236   0236        READ EON-FILE
00237   0237            AT END
00238   0238                GO TO STOP-RUN.
00239   0239        ADD 1 TO READ-CTR.
00240   0240        MOVE FIRST-PART TO PART-1.
00241   0241        IF YEAR EQUAL TO 75
00242   0242           MOVE 1 TO YR
00243   0243            GO TO MOVE-INDEX.
00244   0244        IF YEAR EQUAL TO 76
00245   0245           MOVE 2 TO YR
00246   0246            GO TO MOVE-INDEX.
00247   0247        IF YEAR EQUAL TO 80
00248   0248           MOVE 3 TO YR
00249   0249            GO TO MOVE-INDEX.
00250   0250        IF YEAR EQUAL TO 81
00251   0251           MOVE 4 TO YR
00252   0252            GO TO MOVE-INDEX.
00253   0253        IF YEAR EQUAL TO 82
00254   0254           MOVE 5 TO YR
00255   0255            GO TO MOVE-INDEX.
00256   0256        IF YEAR EQUAL TO 83
00257   0257           MOVE 6 TO YR
00258   0258            GO TO MOVE-INDEX.
00259   0259        MOVE 7 TO YR.
00260   0260
00261   0261    MOVE-INDEX.
00262   0262        MOVE GDP-CELL (YR, IND-2) TO GDP-DEFLATOR.
00263   0263        MOVE PRO-INDEX (YR)       TO PROD-P-INDEX.
00264   0264        MOVE RAW-INDEX (YR)       TO RAW-MAT-P-INDEX.
00265   0265        WRITE OUT-REC.
00266   0266        MOVE SPACES TO OUT-REC.
00267   0267        ADD 1 TO WRITE-CTR.
00268   0268        GO TO READ-EON.
00269   0269
00270   0270    STOP-RUN.
00271   0271        CLOSE EON-FILE, OUT-FILE.
00272   0272        DISPLAY "TOTAL-READ =  " READ-CTR.
00273   0273        DISPLAY "TOTAL-WRITE =  " WRITE-CTR.
00274   0274        STOP RUN.


*STATISTICS*          SOURCE RECORDS =     274        DATA ITEMS =     197        PROC
*STATISTICS*          PARTITION SIZE = 475016         LINE COUNT =      80        BUFF
*OPTIONS IN EFFECT*   PMAP ALLOC ADR =    NONE         SPACING    =       1        FLOW
*OPTIONS IN EFFECT*    NOLISTX        QUOTE        NOSYM     NOCATALR          LIST
*OPTIONS IN EFFECT*    NOCLIST        FLAGW        ZWB       NOSUPMAP        NOXREF
*OPTIONS IN EFFECT*      STATE        TRUNC        SEQ       NOSYMDMP        NODECK
*OPTIONS IN EFFECT*    LANGLVL(2)   NOCOUNT        ADV                     NOVERBSUM
*LISTER OPTIONS*         NONE

END OF COMPILATION
```

Definitions of variables

Variable values are not deflated, but price indices for 2-digit-industry products and raw materials as well as GDP Deflator have been included in the data set for the purpose. Price indices injected in the tape are given in Table 3A.1.

Value of Output (in thousands of Takas)

Q = Q1+ Q2+ Q3+ Q4, where

Q1 = Value of main product

Q2 = Value of byproduct/subsidiary product

Q3 = Value of industrial waste

Q4 = Net value from work done for others minus work done by others for the enterprise and net value of goods sold in the same condition as purchased.

P1...,P4 = Corresponding prices

Value of Inputs (in thousands of Takas)

Capital

K = L + B + M + E + F + K1 + 100 stock, where

L = Value of land, including improvements to it

B = Buildings and structure of all kind

M = Machinery and equipment other than transport

E = Transport equipment

F = Other fixed assets

R = Rent paid for assets owned by others

KM2 = Machinery and equipment imported

K1 = Spare parts: total

KM1 = Spare parts: imported

For certain adjustments to K, see transformations below.

Labor

N = N1+ N2+ N3+ N4+ N5, where

N1 = Production workers, mean manyears of Sept.,Dec.,Mar., and June

N2 = Professional, executive, managerial, technical labor, above and including supervisory staff

N3 = Other employees

N4 = Working proprietors

N5 = Unpaid workers of the family

W = W1 + W2 + W3 + W4 + W5 : Annual wage bill, including wage and salaries, cash and noncash benefits and employer-and-employee contribution to social security, etc. Male and female workers, where separately reported are aggregated together in the respective category.

W1 = Annual wage bill of N1 in thousands of Takas

W2 = Annual wage bill of N2 in thousands of Takas

W3 = Annual wage bill of N3 in thousands of Takas

W4 = Imputed yearly wage bill of N4 in thousands of Takas

W5 = Imputed yearly wage bill of N5 in thousands of Takas

w1 = W1/N1

w2 = W2/N2

w3 = W3/N3

w4 = w2

w5 = w1

Fuels

FU = Value of fuels: total

FUM = Value of fuels: imported

Raw Materials and Other Costs

R = R1 + R2 + R3 + R4, aggregate (indigenous and imported) value.

R1 = Value of the consumption of major raw material

R2 = Value of the consumption of second major raw material

R3 = Value of the consumption of third major raw material

R4 = Value of the consumption of all other materials

RM = Value of the consumption of imported R

RM1 = Value of the consumption of imported R1

RM2 = Value of the consumption of imported R2

RM3 = Value of the consumption of imported R3

RM4 = Value of the consumption of imported R4

R1 = Value of the consumption of imported R

CH = Value of chemicals consumed: total

CHM = Value of chemicals consumed: imported

PM = Value of packing material: total

PMM = Value of packing material: imported

T = Excise tax + sales tax + other taxes, as reported in CMI

S = Subsidy from government, as reported in CMI

INT = Interest paid

OTH = Other non-material costs (insurance, advertisement, etc.

Transformation

VA = Q - (R + CH + PM + FU)

NW = VA-W

V1 = (KM1 + KM2)/K

V2 = 0.1 (KM1 + KM2)/Q

V3 = W/Q

V4 = R1/Q

V5 = RM1/Q

V6 = R2/Q

V7 = RM2/Q

V8 = R3/Q

V9 = RN3/Q

V10 = CH/Q

V11 = CHM/Q

V12 = PM/Q

V13 = PMN/Q

V14 = FU/Q

V15 = FUM/Q

V16 = T/Q

V17 = S/Q

V18 = NW/Q

V19 = INT/Q

$K'_{it} = \beta_t K_{it}$, for ith enterprise, where

$$\beta_t = \frac{2 \sum_i Q_{it}}{\sum_i K_{it}}, \text{ and}$$

$$r_{it} = \frac{(NW)_{it}}{K'_{it}}$$

where subscript t stands for time (a year). It is apparent that we made a sweeping assumption of uniform under-statement of capital stock by each of the old enterprises. The sample analyzed in the present paper consists of those enterprises that existed before 1973-74 and filled the questionnaire every year.

Capital stock in the New Enterpise Sample

This sample of the CMI consists of those enterprises which did not exist in 1974-75, but entered the industry after that year. Accordingly, for the purpose of productivity growth estimates, their capital was not assumed to depreciate during the reference period, 1975-76--1983-84. However, accretions to capital stock after the initial year of production were duly cumulated. In other words, insofar as K of an enterprise in this sample is concerned, the higher value of it throws the lower value out. When K increases we take it into account; when K is reported to decline (which will most probably be due to artificial depreciation in the enterprise accounts) we ignore it. It is apparent that for an individual enterprise, total-factor productivity (TFP) will not reflect the effect of the new vintage of machines, because the initial year of production is eliminated

in the calculations of year-to-year changes. The vintage effect will, however, fully influence the TFP indices in the overall, recombined CMI.

The shape of capital stock (and output and labor) of the given establishments of the three samples is as follows, where value figures are in thousands of takas:

Variable	Old Estabs	New Estabs	Moribund Estabs	
	1983-84	1983-84	1974-75	
			In 1974-75 prices	In 1983-84 prices
Q	16,861,099	18,722,825	1,984,616	5,676,002
K	2,676,520	5,252,365	338,869	969,165
N	181,743	111,803	43,958	..
E	373	[illegible],087	531	..
K/Q	.1587	.2805	.1707	.1707
K/N	22	47	7.7	22
Q/N	93	167	45	129
Q/E	45150	17224	3738	10691

It is apparent that the use of K' instead of K will not affect year-to-year TFPs perceptibly due to K'>K as such. It will affect only because the share of K' in VA goes up. That effect, too, will however, not influence the values of TFP materially, unless factor intensity varies significantly over time.

The reported TFPs for the "old" sample are based on K', but are not much different from those based on K. Accordingly, no

adjustment was made for the "moribund" sample either. In the merge file tape, both K and K' are reported.

Price Indices (Base: 1973-74=100)

Industry	Ind Code	74-75	75-76	79-80	80-81	81-82	82-83	83-84	84-85	85-86	86-87
1. Food manufacturing except beverages	311 -312	122	156	230	253	273	355	432	415	392	435
2. Beverage Industry	313	124	152	233	245	298	317	337	358	396	458
3. Tobacco	314	120	144	168	170	202	246	258	294	327	367
Food & Beverage mean	31	122	151	210	223	258	306	342	356	372	420
4. Textile manufacturing	321-322	152	158	315	324	348	386	418	487	497	457
5. Leather and its products	324	123	148	330	304	312	396	381	413	423	502
6. Footwear, wearing apparel, etc.	325	104	138	394	393	-	717	742	764	791	807
Textiles Mean	32	126	148	346	340	220	500	514	555	570	589
7. Furniture & fixture except metal	332	105	123	131	131	128	117	134	146	159	183[a]
8. Paper and paper products	341	163	206	370	513	557	659	728	718	715	758[a]
9. Printing and publishing	342	133	133	266	331	430	463	464	463	464	480[a]
Mean	-34	148	169	318	471	493	560	596	590	589	619
11. Chemicals and its products	351/ 352/ 353	155	163	258	288	305	376	403	415	438	460[a]
12. Petroleum	354	153	256	457	736	891	1230	1269	1264	1264	1264[a]
13. Manufacturing of rubber products	356	105	128	192	195	180	242	252	260	311	314[a]
Chemicals Mean	35	141	182	336	406	459	616	641	696	671	679
14. Non-metallic products	36	136	153	227	273	344	367	370	405	453	561[a]
15. Basic metal indus.	371	155	176	238	268	305	360	369	390	382	381[a]

Price Indices--Contd.

Industry	Ind Code	74-75	75-76	79-80	80-81	81-82	82-83	83-84	84-85	85-86	86-87
16.Metal products	381/382	127	148	310	383	285	374	385	393	404	447[a]
17.Machinery except electrical	383	125	144	147	158	235	290	254	231	226	287
18.Electrical machinery	384	165	170	196	263	273	285	304	312	220	341[a]
19.Transport equipment manufacturing	385	125	202	246	230	262	199	260	325	359	379[a]
Mean	38	135	166	224	261	264	287	301	315	329	363
20.Misc. industries	393/394	138	196	341	169	176	154	225	452	492	498[a]
21.Gas	412	100	100	141	141	142	180	189	397	421	508[a]
22.Electricity	411	306	306	469	563	563	667	732	755	784	784[a]
23.Raw material		125	117	179	199	219	243	259	268	273	279
24.GDP Deflator[b]		170	131	209	231	260	273	318	365	400	445

[a]Provisional figure.

[b]GDP deflator for Years 1972-73= 71, 1987-88= 478.

Sources: For Manufacturing: Statistical Year Book: 1980, 1982, 1985, and 1986.

For Raw Materials: Statistical Year Book: 1980, 1986 (p.431).

For GDP Deflators: Statistical Year Book: 1979 (p.340), 1980 (p.392), 1984 (p. 591), 1982 (p.531), and 1986, p.755.

Table 3A.1.--Year-to-Year TFP growth indices, 1974-76 through 1983-84, CMI: "old" establishments

TOTAL FACTOR PRODUCTIVITIES

INDUSTRY (1)	75-76 (2)	79-80 (3)	80-81 (4)	81-82 (5)	82-83 (6)	83-84 (7)	CUML (8)
3114	3.0764	0.6175	0.2802	1.0996	0.4198	2.2441	0.5514
3115	1.5683	0.3201	1.0098	1.3681	1.2517	1.8055	1.5673
3116	1.9569	0.2076	1.0091	1.4176	0.5459	0.7788	0.2471
3118	4.3044	0.1298	0.6176	0.6424	0.9129	0.8814	0.1764
3119	4.8072	0.6778	0.6386	0.9473	0.6787	0.8840	1.1826
3122	0.8746	0.5963	0.8836	0.4502	0.8211	0.2834	0.0483
3125	0.9569	0.8685	0.9117	0.4995	0.3039	2.6683	0.3069
3126	1.2384	0.4762	1.2440	0.8488	0.8502	0.5253	0.2781
3131	1.7008	0.2056	0.9484	0.6503	1.3778	0.7084	0.2105
3134	1.0894	0.5837	0.6506	1.8177	0.5153	0.2000	0.0775
3141	1.4016	0.5923	1.0447	0.7792	1.0216	0.7286	0.5030
3144	1.1719	1.0101	0.3134	1.1689	1.2101	0.6610	0.3469
3201	1.1534	0.8322	0.8257	0.9128	0.9422	.9523	.6491
3202	1.1700	2.1556	.7635	.8496	0.9185	1.4369	2.1591
3203	0.4606	0.6802	0.9832	0.9095	1.1620	1.1404	0.3712
3204	0.8389	0.6733	0.9906	0.9053	0.9494	1.1178	0.5376
3205	0.9410	0.5360	0.8443	1.0691	1.3765	1.0513	0.6588
3206	0.4718	0.6174	1.0790	0.9271	0.7882	0.7521	0.1727
3213	1.0120	0.6376	1.1877	1.0834	1.0755	1.1194	0.9996
3216	1.4848	1.1497	0.9960	0.8650	0.7585	1.0926	1.2188
3231	2.4408	0.3228	0.9716	0.8221	0.9443	1.0815	0.6427
3241	1.6254	0.3556	0.4335	1.3871	0.3885	2.0965	0.2831
3253	2.5710	0.0487	0.3301	1.1808	0.8035	0.5361	0.0210
3311	1.5778	0.6743	1.2120	1.1617	1.1615	1.0896	1.8958
3314	1.1828	0.3895	1.0087	0.8349	0.9114	1.0138	0.3585
3321	1.9495	0.7165	0.9935	2.1190	1.4083	1.1350	4.7003
3411	1.0791	1.2789	1.0602	0.9684	0.6503	1.2857	1.1847
3412	0.9450	0.5731	0.5973	0.6526	1.0459	1.1567	0.2554
1413	0.7383	1.0482	1.4912	0.8877	1.0467	1.0068	1.0796
1422	1.4146	1.3238	0.8034	0.8215	0.5868	0.7643	0.5543
3501	1.2781	1.5649	0.7740	0.9640	0.7846	1.0657	1.2478
3503	1.6071	1.0931	1.1295	0.0851	0.7116	2.0156	0.2422
3504	1.0678	0.7306	1.3687	2.0099	0.8545	0.3925	0.6672
3515	1.2574	1.1843	0.9956	1.0743	0.5528	0.8082	0.7116
3516	1.4718	0.8153	1.2379	1.9369	0.4971	1.1080	1.5847
3519	0.9667	0.4922	0.8423	1.0432	0.9641	1.0266	0.4138
3521	1.3178	0.9231	1.0971	0.6553	1.1386	0.9996	0.9950
3522	1.5490	0.8667	0.8869	0.7482	1.1439	1.1416	1.1634
3523	1.6600	0.4910	0.9443	1.0193	0.7892	0.9557	0.5917
3525	1.3064	1.0602	1.0774	0.9651	0.5323	1.3908	1.0662
3526	0.9090	0.9189	0.3767	1.3249	0.5314	1.2236	0.2711
3528	1.4318	0.9437	1.1427	1.4758	0.4554	1.1112	1.1531
3569	0.4740	1.0480	1.1674	1.1659	0.7467	0.7853	0.3965
3691	1.7897	0.7355	0.9392	1.0240	0.6463	0.8353	0.6834

Table 3A.1.--Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3695	1.2973	0.1864	1.9874	0.4863	0.8765	0.9641	0.3016
3712	1.1623	0.4235	1.0523	3.3040	0.9925	1.1017	1.8713
3713	2.1184	0.8409	1.0256	1.1704	0.4760	0.4044	0.4116
3719	0.9959	0.6267	1.3226	0.6146	0.9422	1.1808	0.5644
3802	1.2305	0.2686	1.3136	0.7600	0.9909	0.9835	0.3455
3803	1.2905	0.4229	1.9343	0.9092	0.7827	0.6709	0.5040
3804	1.1606	1.0512	0.8587	1.0947	1.0261	1.1355	1.3362
3807	1.1604	0.9079	0.4060	1.0091	1.0619	0.9024	0.4136
3809	1.1416	0.3465	1.3579	0.9943	0.8653	1.3692	0.6327
3814	2.4445	0.0266	1.0638	0.9498	6.4089	0.1444	0.0608
3815	0.8759	2.8515	1.8314	0.6531	1.0770	0.9921	3.1920
3816	1.3694	1.4527	0.8346	1.4243	0.9340	1.2697	2.8044
3817	1.1409	0.6732	0.4338	0.7808	1.2272	0.9244	0.2951
3819	0.5323	1.7037	2.3609	1.1258	0.8815	1.1679	2.4815
3922	0.8561	1.9949	1.4700	0.4136	0.9915	1.2181	1.2541
3823	0.8893	0.7048	1.1020	0.9078	0.9758	1.5631	0.9564
3824	0.7491	1.8585	1.5983	0.9034	1.4145	0.9502	2.7018
3825	0.8963	0.9476	1.0048	0.7420	0.7479	1.7495	0.8285
3827	1.7728	0.7345	1.0023	2.5522	0.4476	1.5658	2.3345
3829	1.1392	0.9952	1.4506	0.8427	0.8986	1.3206	1.6446
3832	1.8492	0.5803	0.8964	0.7789	0.7113	0.6870	0.3661
3834	0.9327	0.9326	0.4283	0.8465	4.3529	0.4814	0.6608
3839	1.2599	0.9648	0.8669	1.1260	1.2498	0.8178	1.2127
3846	1.1177	0.6824	0.6612	1.3713	0.6672	1.3196	0.6089
3862	0.8180	0.6161	1.2745	1.1275	1.1091	0.5287	0.4247
3936	1.2227	0.6213	0.8936	0.9919	2.2553	0.3233	0.4910
3937	1.1061	0.7279	1.0486	0.8748	1.4390	1.0701	1.1373
3938	0.9831	1.5422	1.4035	0.5678	0.9565	1.1474	1.3260
3942	1.1764	2.1885	0.5361	0.5914	1.1896	0.0790	0.0767
3949	0.8473	0.7580	0.8763	1.6031	0.8594	1.3787	1.0690
Total	74	74	74	74	74	74	74
Total:TFP>1	52	19	36	30	24	40	26
%	70	26	49	41	32	54	35

Table 3A.2.--Year-to-Year TFP growth indices, 1979-80 through 1983-84, CM1: "new" establishments

INDUSTRY (1)	TFP 79-80 (2)	TFP 80-81 (3)	TFP 81-82 (4)	TFP 82-83 (5)	TFP 83-84 (6)	TFP CUMULATIVE (7)
3112	2.5136	1.0617	.6972	.7980	1.1453	1.7005
3113		1.1842	1.0581	1.1751	0.6731	1.0120
3114	1.4348	.4286	.9302	.8767	0.8981	0.4503
3116		.6927	1.1103	.9468	1.0008	1.4370
3117				.7279	1.4000	1.4000
3118	.4991	.6577	1.0888	.6554	1.3112	0.3071
3122	.2372	1.0873	.5287	1.0313	0.5287	0.0743
3125		1.5244	.4390	1.1682	0.9341	0.7302
3126	.3866	1.0667	1.0589	.9402	0.6019	0.2471
3127		.8331	.9054	.7040	0.6400	0.3398
3128					0.7088	0.7088
3141		1.0677	.7830	.6233	0.8178	0.4261
3144		.8450	.7421	.8091	1.1292	0.5729
3145		.4126	4.5842	.7786	1.0059	1.4813
3201	.6990	.8566	.8642	1.0806	1.1201	0.6263
3203	.8702	1.7387	.6007	.6058	1.4713	0.8100
3204	.7084	.7440	.7532	.9999	1.3895	0.5515
3205		.8057	.4295	1.4494	1.0356	0.5194
3206	.1685	.8536	.9002	.6736	0.6014	0.0524
3213	.8620	1.1428	1.0448	1.0578	1.2427	1.3529
3214			.5777	.8861	1.2199	0.6244
3215		1.0833	.8676	.6698	0.7038	0.4430
3216		1.0125	.9642	1.0715	1.0585	1.1072
3221		.2401	.7868	1.0687	1.3190	0.2662
3231	.2161	.8448	1.4209	.8131	0.9770	0.2060
3233		1.3126	1.0877	1.0427	1.1577	1.7234
3311		1.9325	1.0612	1.5939	0.3998	1.3068
3312			.9294	1.4842	1.1499	1.5861
3411	.1995	.2716	2.0451	1.1182	0.9499	0.1177
3413		.7835	1.2353	.6051	0.7741	0.4533
3421	.4699	.9462	.7594	.5193	2.1260	0.3727
3501	.9258	.9381	.6081	.6907	0.9240	0.3370
3502		2.0235	1.1275	.5567	0.9989	1.2687
3503	1.2080	1.5159	1.1303	.4966	0.8377	0.8610
3504	.8198	1.7372	.3742	.7175	0.9549	0.3651
3515			.7512	.7504	1.0284	0.5797
3516	.4932	1.8747	3.7781	.5440	0.8698	1.6529
3519					1.5626	1.5626
3521	2.7839	.5536	1.1305	.6675	0.9739	1.1326
3522	.7670	.8641	.8421	.6504	0.6440	0.2337
3523	1.7839	1.7711	.5089	.6094	1.0676	1.0460
3524	.9848	1.3072	.8339	.8206	1.2741	1.1223
3525	2.3593	1.0594	.9333	1.1132	0.6130	1.5918
3527		1.0931	1.1978	.5223	1.1754	0.8038
3528		.6857	2.1358	.3628	1.4607	0.7761
3529					1.2917	1.2917
3530	1.7245	1.1810	1.0038	.6799	1.2069	1.6775

Table 3A.2.--Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
3541		1.0726	.4243	1.0712	0.5095	0.3947
3551		.1682	1.2330	.9795	2.5357	0.5153
3559			.3155	1.0627	1.1812	0.3958
3569		.7842	1.1803	1.2441	0.8573	0.9825
3612	1.1173	.7955	.7467	1.0313	1.0949	0.7494
3622				1.2817	1.0737	1.3761
3691		2.1773	.3077	.7695	1.2373	0.6378
3693			.8081	.6660	1.6711	0.8993
3712		.7855	1.2448	1.2015	1.0894	1.1983
3713	1.2635	.6336	1.0604	.6027	0.8368	0.4537
3719	1.9845	.6665	1.3759	.6145	1.2755	1.4263
3801		1.2785	1.1810	1.0611	0.9245	1.4812
3802		1.7569	.9082	5.4381	1.0257	8.9001
3804		.7477	1.1104	1.0008	1.1330	0.9414
3805	1.7041	1.0683	1.6314	.4982	1.2102	1.7906
3807	.8747	.8813	1.6238	1.0224	0.9411	1.2044
3808	1.6181	.5295	.7218	.6888	1.5055	0.6413
3809	2.0899	.6288	1.4425	.9158	1.0175	1.7663
3813		.8314	.7896	1.1817	1.0787	0.8368
3814	.4864	.6901	.9474	1.8729	0.9880	0.5884
3815		.8972	1.0686	1.0480	1.2102	1.2159
3816	1.1942	.7513	1.0044	.4720	0.9844	0.4187
3817	1.1501	.3922	1.0029	.7723	1.0531	0.3679
3819	.5872	1.3306	.8624	.4645	1.2157	0.3804
3821			.4883	1.7675	1.7070	1.4732
3822		.5414	.7744	.8565	0.4784	0.1717
3824	.6370	1.5709	.8668	.7624	0.8893	0.5880
3825				.7707	1.1860	0.9140
3829		3.2256	.3250	.4942	1.2783	0.6622
3832				1.1833	0.7483	0.8854
3833	.7711	.8455	.9215	1.2027	0.7494	0.5414
3835				1.0805	1.4353	1.5508
3836				10.3710	1.3190	13.6793
3839				2.5741	0.6454	1.6613
3845	1.4690	1.0538	.9407	.6004	1.1517	1.0069
3846		1.5735	2.0248	1.7336	1.1271	6.2252
3862		.9787	1.1138	1.5208	0.8350	1.3842
3937	1.2271	.7652	.7835	1.3007	1.2581	1.2038
3938		.9015	.6496	1.1203	1.1577	0.7595
3942		1.8868	.6904	.9933	0.1584	0.2049
3949		1.2631	1.8354	1.1572	1.0960	2.9402
Total Inds.	38	72	78	85	114	114
Total with TFP>1	17	33	34	37	52	34
%	45	46	44	44	46	30

Table 3A2.--Contd.

Ignoring the first year, allowing partial production in the first year
24 experienced almost continuous TFP rise throughout the period
54 out of 114 industries are common to both subsamples

Only 54 are common	
Old sample has 24 addition	
New sample has 36 addition	
Total	114

Table 3A.3.--Year-to-Year TFP growth indices, 1975-76 through 1982-83, CMI: "Moribund" establishments

INDUSTRY (1)	TFP 75-76 (2)	TFP 79-80 (3)	TFP 80-81 (4)	TFP 81-82 (5)	TFP 82-83 (6)	TFP CUMULATIVE (7)
3112	1.1379					1.1379
3116	2.9077	.1510	1.0808	1.9202	3.6256	3.3036
3118	3.6101	.2894	.6751			0.7094
3119		.3823	1.3474	.2161	1.0771	0.1109
3122	.8699	.5207	1.1393	.7058	1.3051	0.4753
3125	.7244	.4116				0.2931
3126	1.1657	.4207	1.6550	.8229	.8322	0.2931
3145	.8411					0.8411
3201	1.4070	.9534	1.0450	.7523		1.0545
3203	.1356	.2366	1.3461	1.2402	1.3706	0.0734
3204	.8540	.3408	1.5594			0.4538
3205	1.2851					1.2851
3206	1.1523	1.2311	1.0695	.7772	.7183	0.8469
3207		.3860	.9526	1.0773	.9946	0.3939
3213	1.2921					1.2921
3216	1.4497					1.4497
3219	.6985					0.6985
3231	.3584	.4651	2.1426	4.1686		1.4888
3253		1.0611	.3659	2.3587	.5007	0.4585
3321	.9583	1.7837	1.1547	1.6325	1.4674	4.7281
3413	1.1724	.6251	1.0550			0.7731
3422	7.9612	1.1088	.8331	1.5795		11.6157
3501	.9516	.4571	1.5841	.6892		0.4748
3513	.8232					0.8232
3515	.1689	4.1822				0.7063
3516	.9673					0.9673
3522	.8995	.4094				0.3682
3523	.1158					0.1158
3559	1.5775					1.5775
3569	1.9433	.6059	1.0847	1.3515		1.7261
3622	.8849	.7667	1.4863	2.0888	1.4344	3.0212
3713	2.2406	.4990	.5077			0.5676
3805	.3378	4.2337	.5613			0.8027
3607	1.0140	1.2597	1.5084	1.3492	.9410	2.4461
3809	.8756	1.0716	.9917	.8725	.8075	0.6555
3817	.6594					0.6594
3819	1.0280	.3540	1.1448	7.8037	.3818	1.3412
3822		.7412				4.4386
3824	.7889	.7276	1.7530			1.0062
3825	2.0285	2.9196	2.2558	.2498	.9066	3.0255
3827			.5356	.8676	.9385	0.4361
3829	.4507	2.1525	8.4849	.6642	1.5590	8.5235
3832	.8087	2.5947	4.8406	1.0899	2.2294	24.6801
3833	1.2426	2.3683	.3544	.9848	1.1295	1.2580
3835	.7746	.4524	.1513	.6922		0.0367
3844		2.1423				2.1423
3846	1.3619	.7561	.7187	1.1427	1.0054	0.8502

Table 3A.3.--Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
3862	.6991					0.6991
3937	1.3519	.9088	.6428			0.7857
3938	.8102					0.8102
Total Indus.	44	36	32	25	19	
Total with TFP>1	20	13	20	13	10	21
%	46	36	63	52	53	42
Died after TFP>1	..	5	2	3	3	13
Died after TFP<1	..	8	4	4	3	19

Table 3A.4.--Year-to-Year growth indices, 1975-76 through 1983-84, CMI: "overall" establishments

INDUSTRY	75-76	79-80	80-81	81-82	82-83	83-84	CUMUL
3112	.8570	.6170	1.0615	.6914	.7468	1.1417	0.3558
3113			1.1212	1.0116	1.1291	.6596	0.8467
3114	1.0799	.9080	.3868	.9235	.8558	.9271	0.2780
3115	1.2268	.4565	.9824	1.4342	1.2571	1.9782	1.9715
3116	2.6067	.2676	.9390	1.5086	1.3233	1.1004	1.4386
3117					.7275	1.4000	1.0191
3118	1.8003	.1832	.6362	.9407	.6479	1.1722	0.1497
3119	5.9054	.4983	.9037	.7870	.7683	.9732	1.3859
3122	.6688	.2395	1.1535	.4974	.8946	.4777	0.0393
3125	.8126	1.0278	1.2512	.4623	1.0082	1.3175	0.6417
3126	1.1072	.6127	1.1729	.9433	.8721	.5558	0.3638
3127			.8331	.9054	.7040	.6400	0.3399
3128						.6933	0.6933
3131	1.2628	.3159	.9166	.6886	1.3702	.7175	0.2475
3134	.8521	.8134	.6311	1.8829	.8159	.3079	0.2069
3141	1.0415.	.6767	1.0133	.8564	.9797	.8058	0.4828
3144	1.1074	1.0147	.5026	.8734	.9682	.9403	0.4491
3145	.8411	1.7057	.4140	4.6089	.7786	1.0059	2.1440
3201	.9339	.7982	.7794	.3552	1.1255	.9960	0.2313
3202	1.0114	2.6963	.7424	.9309	.9763	1.5251	2.8062
3203	.2920	.7871	1.1730	.7484	1.4927	1.3255	0.3992
3204	1.4897	.8030	.7668	.7702	.9982	1.3584	0.9580
3205	.3817	.6412	.8333	.7656	1.2767	1.0414	0.4795
3206	.4251	.7661	1.0296	.9130	.8151	.2853	0.0712
3207		.3860	.9526	1.0773	.9946		0.3940
3213	.8916	.9653	1.1572	1.0693	1.0571	1.1476	1.2920
3214				.5777	.8858	1.2199	0.6243
3215			1.0833	.8676	.6698	.7038	0.4431
3216	1.2921	.6695	1.0171	.9633	1.0505	1.0493	0.9343
3219	.6985						0.6985
3221			.2378	.7830	1.0605	1.3117	0.2590
3231	1.8660	.4337	.9211	1.1714	1.0015	1.2005	1.0498
3233			1.2838	1.0772	1.0333	1.1337	1.6200
3241	1.3484	.4667	.4188	1.4624	.3867	2.1137	0.3150
3253	3.5057	.4614	.8698	2.1399	1.3740	1.0811	4.4722
3311	1.3938	.3735	1.3350	1.1633	1.2700	.4733	0.4860
3312				.9294	1.4842	1.1499	1.5862
3314	1.1500	.3950	1.0594	.8711	.9320	1.0881	0.4251

Table 3.6.--Cont'd.

INDUSTRY (1)	75-78 (2)	79-80 (3)	80-81 (4)	81-82 (5)	82-83 (6)	83-84 (7)	CUML. (8)
3321	1.5317	1.6089	1.1774	1.0896	2.0207	.4828	6.7414
3411	1.1401	.6060	.6064	1.5552	.9211	1.0779	0.6487
3412	.8547	.7081	.5862	.6962	1.0884	1.2743	0.3426
3413	.8035	.8964	.7869	1.2332	.6072	.7745	0.3287
3421		.4699	.9460	.7575	.5148	2.1151	0.3666
3422	2.4368	1.2949	1.0961	1.1928	1.4222	1.1780	8.9672
3501	1.0669	1.3042	.8239	.7399	.7429	1.0180	0.6415
3502			2.0228	1.1244	.5561	.9968	1.2603
3503	1.0294	1.0641	1.1918	.2479	.5945	1.7289	0.3326
3504	1.1379	.8670	1.6626	.6523	.8557	.6283	0.5752
3513	.8232						0.8232
3515	.2827	2.7236	4.9056	.7593	.7442	1.0196	2.1762
3516	1.3925	1.1031	1.5283	3.2684	.6674	1.4909	7.6346
3519	.7938	.6458	.8267	1.0806	.1399	1.3083	0.0838
3521	.9207	1.2854	.8909	.7382	.9607	.9800	0.7328
3522	2.2931	.8553	.9000	.8356	.6606	.6469	0.6303
3523	1.2323	.9412	1.1133	.7973	.7175	.9952	0.7351
3524		.9848	1.3018	.8330	.8181	1.2655	1.1056
3525	1.0526	1.2001	1.0764	.9934	.6091	1.2775	1.0511
3526	.8057	1.3497	.3654	1.3964	.5289	1.2503	0.3669
3527			1.0564	1.1640	.5118	1.1044	0.6950
3528	1.4043	2.6273	1.8664	2.6658	.7326	2.1391	28.7673
3529						1.2052	1.2052
3530		1.7245	1.1810	1.0038	.6799	1.2069	1.6776
3541			1.0726	.4243	1.0712	.8098	0.3948
3551			.1682	1.2330	.9799	2.5357	0.5153
3559	1.5775			.3126	1.0452	1.1537	0.5946
3569	.4422	1.1046	.9296	1.1032	1.0555	.8323	0.4401
3612		1.1173	.7955	.7467	1.0313	1.0949	0.7494
3622	.8849	.7667	1.4863	1.1624	1.0911	1.3596	1.7388
3691	1.4753	1.0799	1.0560	.9155	.6604	.8928	0.9081
3693				.7922	.6463	1.4956	0.7657
3695	1.0867	.2917	1.9361	.5058	.8801	1.0446	0.2854
3712	1.0279	.5983	.9935	3.4223	1.0998	1.3024	2.9951
3713	1.6449	1.1282	.8761	1.1921	.5073	.5149	0.5063
3719	.7567	.9695	1.0383	.9608	.8346	1.2270	0.7495
3801			1.2775	1.1807	1.0607	.9242	1.4786
3802	1.0858	.2073	1.3792	.8022	1.8123	1.0029	0.4526
3803	1.0529	.5331	1.9049	.9419	.7791	.6779	0.5319
3804	1.0603	.5762	.7987	1.0977	.8806	1.1313	0.5336
3805	.3039	2.8568	.8105	1.4992	.4977	1.2071	0.6338
3807	.9406	.5382	.9333	1.1876	.9753	.7938	0.4344
3808		1.6181	.5295	.7218	.6888	1.5055	0.6413
3809	.8682	.7031	.9171	1.1753	.8906	1.1514	0.6747
3813			.8267	.7896	1.1793	1.0759	0.8282
3814	1.4707	.2641	.7303	.9778	2.2381	.8321	0.5165
3815	.7997	2.5363	1.1870	1.0704	1.1417	1.1991	3.5280
3816	2.0746	1.2026	.7525	1.0587	.4930	1.0230	1.0024
3817	.9478	1.0126	.4126	.9106	.9422	.9970	0.3387

Table 3.8.--Contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3819	.9696	.8355	1.4403	1.1158	.3955	1.1764	0.6057
3821				.4883	1.7675	1.7070	1.4733
3822	.9769	2.9454	.8539	.6135	.8926	.5983	0.8050
3823	.8486	.7243	1.1462	.9594	.9799	1.6213	1.0738
3824	1.2529	.9167	1.6398	.9367	.7635	.8894	1.1980
3825	1.3009	2.0020	1.7743	.7662	.8688	1.3132	4.0395
3827	.4726	2.0458	.5744	1.4898	.6721	2.5260	1.4046
3929	.4967	2.9491	3.7924	.3062	.5006	1.2799	1.0899
3832	1.4409	.9484	.9476	.6153	.7425	.7405	0.4381
3833	2.2724	1.0143	.7241	.9423	1.1764	.8094	1.4975
3834	.7268	1.1915	.6162	.8851	4.3368	.5275	1.0805
3835	.7746	.4524	.1513	.6836	.5929	1.9740	0.0424
3836					10.3710	1.3188	13.6773
3839	1.1459	1.1844	.8504	.7964	1.4870	.7040	0.9692
3844		2.1423					2.1423
3845		1.4657	1.0471	.9377	.5984	1.1472	0.9879
3846	1.0510	.6599	.6864	1.1017	.8947	1.0472	0.4914
3862	.7244	1.0484	1.3008	1.3164	1.3062	.7470	1.2689
3936	1.1811	.6831	.8943	1.0636	2.4210	.4281	0.7954
3937	.9876	.8499	1.1457	.8714	1.3787	1.1247	1.2994
3938	.8706	1.9079	1.1193	.6235	1.0557	1.1510	1.4086
3942	1.0041	1.4452	2.1412	.7295	1.3075	.1340	0.3971
3949	.7319	.4479	1.1373	1.7879	1.0902	1.1580	0.8415
Total No. of Industries experiencing:							
TFP>1	46	36	47	41	41	66	39
TFP<1	37	53	51	62	64	40	71
All	83	89	98	103	105	106	110
TFP>1 %	55	40	48	40	39	62	35

No. of industries = 110; No. of establishments = 1595

Table 11.--Translog production function with establishment dummies, Industry Code: 3126: Tea and Coffee Processing, CMI Panel Data, 358 Observations, 290 degrees of freedom

EQUATION NUMBER 1 DEPENDENT VARIABLE.. LQ

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	SE B	BETA	T	SIG T
ENTD50	-.946594	.217457	-.072832	-4.353	.0000
LKSQ	.040111	.022073	.513257	1.817	.0702
ENTD44	-.148229	.161353	-.014537	-.919	.3590
ENTD54	-.851844	.189777	-.083540	-4.489	.0000
ENTD32	-.243299	.166087	-.023860	-1.465	.1440
ENTD6	-.630000	.149412	-.072897	-4.217	.0000
ENTD55	-.597285	.164796	-.058575	-3.624	.0003
ENTD58	-.596518	.174982	-.052398	-3.409	.0007
ENTD45	-.086266	.157996	-.009254	-.546	.5855
ENTD35	-.089392	.168610	-.008767	-.530	.5964
ENTD57	-.488966	.166846	-.047953	-2.931	.0037
ENTD37	-.089191	.166646	-.008747	-.535	.5929
ENTD39	.032964	.160056	.003536	.206	.8370
ENTD28	-.515941	.147631	-.059699	-3.495	.0005
ENTD38	-.272191	.155407	-.029200	-1.751	.0809
ENTD4	-.539916	.153527	-.062473	-3.517	.0005
ENTD50	-.185300	.175941	-.018172	-1.053	.2931
ENTD56	-.500930	.193665	-.049125	-2.587	.0102
ENTD59	-.524008	.170543	-.051389	-3.073	.0023
ENTD26	-.495787	.153280	-.057367	-3.235	.0014
ENTD52	-.464396	.161627	-.045543	-2.873	.0044
ENTD24	-.120139	.155369	-.012894	-.769	.4427
ENTD19	-.399526	.160964	-.042871	-2.483	.0136
ENTD43	-.542011	.189691	-.047510	-2.857	.0046
ENTD21	-.341581	.147086	-.039524	-2.322	.0209
ENTD18	-.031256	.153018	-.003618	-.204	.8382
ENTD31	-.183640	.148014	-.021249	-1.241	.2157
ENTD5	.217850	.146937	.025207	1.483	.1393
ENTD51	-.709460	.176297	-.069575	-4.024	.0001
ENTD23	.238794	.149088	.027531	1.602	.1103
ENTD48	-1.005609	.239157	-.076606	-4.205	.0000
ENTD33	.098822	.154764	.010501	.639	.5236
ENTD2	-.412552	.158446	-.047736	-2.604	.0097
ENTD34	-.151529	.157906	-.015851	-.963	.3365
ENTD36	-.482913	.169252	-.051806	-2.853	.0046
ENTD53	-.748413	.176649	-.073395	-4.237	.0000
ENTD9	-.253638	.152137	-.029348	-1.667	.0967
ENTD46	-.727338	.206784	-.078027	-3.517	.0005
ENTD42	-.453420	.176652	-.045447	-2.623	.0092
ENTD40	-.372932	.175227	-.085598	-4.981	.0000
ENTD13	-.625279	.155580	-.072465	-4.025	.0001
ENTD22	-.290596	.149166	-.033625	-1.943	.0524
ENTD7	-.101252	.179536	-.010862	-.564	.5732
ENTD29	-.511519	.167831	-.059199	-3.047	.0025

Table 11.—Cont'd.

EQUATION NUMBER 1 DEPENDENT VARIABLE.. LQ

---------- VARIABLES IN THE EQUATION ----------

VARIABLE	B	SE B	BETA	T	SIG T
ENTD12	-.250505	.149531	-.028986	-1.675	.0950
ENTD47	-1.050123	.376794	-.030759	-2.814	.0052
ENTD17	-.702144	.171161	-.081244	-4.102	.0001
ENTD15	-.345736	.154267	-.040005	-2.241	.0258
ENTD8	-.305791	.166601	-.035383	-1.835	.0675
ENTD10	-.503398	.159853	-.058248	-3.149	.0018
ENTD25	-.595178	.172295	-.068367	-3.454	.0006
ENTD20	-.469988	.167567	-.054382	-2.805	.0054
ENTD14	-.397206	.165921	-.045960	-2.394	.0173
ENTD27	-.714040	.174535	-.082621	-4.091	.0001
ENTD41	-.794128	.196979	-.085192	-4.032	.0001
ENTD16	-.145652	.205770	-.016853	-.708	.4796
ENTD49	-1.402744	.333018	-.137566	-4.212	.0000
ENTD3	-.618927	.203693	-.071615	-3.039	.0026
LLSQ	-.027278	.021118	-.152152	-1.292	.1975
ENTD11	-.498093	.205852	-.057634	-2.420	.0161
ENTD30	-1.260472	.334120	-.135221	-3.773	.0002
LGRMSQ	.048637	.017782	.653609	2.735	.0066
LL	.127331	.483193	.030111	.264	.7923
LGRM	.507249	.227027	.500358	2.234	.0262
LKLLGRM	-.003747	.006837	-.270221	-.548	.5841
LK	-.995711	.301448	-.981062	-3.303	.0011
LGRM__	-.072320	.055739	-.541580	-1.306	.1924
LKLL	.143178	.067314	1.010514	2.127	.0343
(CONSTANT)	5.122553	1.613287		3.175	.0017

END BLOCK NUMBER 1 TOLERANCE = 1.0E-04 LIMITS REACHED.

R^2 Adj .948

Table 2.--Coefficients of year dummies, CMI data base

Year	Coefficient of Year Dummies by Size-Class						
	Overall	Size-Class					
		1	2	3	4	5	6
1976	.2039*	-.1104	.2257*	.2946*	.1840*	.2391*	.1520*
1980	.0419*	..	.0593	.0761*	.0284	-.0107	.0539
1981	.0509*	-.0028	.0198	.0919 *	.0648	.0211	.0437
1982	.0147	.0224	.0144	.0770*	.0045	-.0323	-6.4729
1983	.0663*	.1191	.0949	.1239*	.0412	.0132	.0561
1984	.0082	.0940	.0141	.0526	-.0209	7.6085	-.0018
Mean Q	656.550	82.930	96.447	156.491	336.635	1261.428	8830.792
DF	6608	75	568	1508	1944	796	1630

* Denotes $t \geq 2$.

Table 7.c3.--Regression for EFF (= Coeff + ERR): Cotton Textiles

EQUATION NUMBER 9 DEPENDENT VARIABLE.. EFF

DESCRIPTIVE STATISTICS ARE PRINTED ON PAGE 4

BEGINNING BLOCK NUMBER 1. METHOD: ENTER IMI1 LAGERA1

VARIABLE(S) ENTERED ON STEP NUMBER 1.. DPUB
2.. KOVERN
3.. LAGERA1
4.. SIZE

MULTIPLER	.71036	ANALYSIS OF VARIABLE	
R SQUARE	.50461		DF
ADJUSTED R SQUARE	.48519	REGRESSION	4
STANDARD ERROR	.29275	RESIDUAL	102

F = 25.97483 SIGN

----------VARIABLES IN THE EQUATION----------

VARIABLE	B	SE B	BETA	T	SIG
DPUB	.092027	.064920	.111503	1.417	.1594
KOVERN	.001252	7.756be-04	.134480	1.614	.1097
LAGERA1	-1.682188	1.153604	-.102533	-1.458	.1479
SIZE	.268538	.034389	.718784	7.809	.0000
(CONSTANT)	1.575140	2.250484		.700	.4856

END BLOCK NUMBER 1 TOLERANCE = 1.0E-04 LIMITS REACHED.

----------VARIABLES NOT IN THE EQUATION----------

VARIABLE	BETA IN	PARTIAL	MIN TOLER	T.	SIG T
IMI1	1.000000	1.000000	-2.796E-17	.	.
DGDP	-1.000000	-1.00000	-4.194E-17	.	.

Table 8.c3.--REGRESSION FOR EFF (= Coeff + ERR): Tea & Coffee Processing

EQUATION NUMBER 9 DEPENDENT VARIABLE .. EFF

DESCRIPTIVE STATISTICS ARE PRINTED ON PAGE 3

BEGINNING BLOCK NUMBER 1. METHOD: ENTER LAGERA1 N

VARIABLE(S) ENTERED ON STEP NUMBER 1.. DFUB
2.. DGDP
3.. N
4.. KOVERN
5.. LAGERA1

		ANALYSIS OF VARIABLE		
MULTIPLE R	.32882		DF	S
R SQUARE	.10812	REGRESSION	5	
ADJUSTTED R SQUARE	.09220	RESIGUAL	280	
STANDARD ERROR	.38345			

F = 6.78885 SIGNI

----------VARIABLES IN THE EQUATION----------

VARIABLE	B	SE B	BETA	T	SIG T
DFUB	.130677	.090840	.082954	1.439	.1514
DGDP	1.68786E-94	1.7088E-04	.058368	.987	.3243
N	3.68350 4E-04	1.3407E-04	.206212	3.605	.0004
KOVERN	.002168	.001359	.092789	1.596	.1117
LAGERA1	-1.492735	.386302	-.228593	-3.862	.0001
(CONSTANT)	-.522720	.063393		-8.246	.0000

END BLOCK NUMBER 1 ALL REQUESTED VARIABLES ENTERED.

Table 10b.--Efficiency (eff) by size-class: Tea and Coffee Proces
(Code 3126)

$$\text{Eff} = \frac{\text{Estab Coeff + Intercept}}{\text{Best Practice Estab Coeff + Intercept}}$$

CRITERION VARIABLE EFF

BROKEN DOWN BY SIZE

VARIABLE	VALUE	LABEL	MEAN	STD DEV	CASES
FOR ENTIRE POPULATION			.8763	.0603	368
SIZE	3.00		.8039	.0873	11
SIZE	4.00		.8369	.0589	33
SIZE	5.00		.8659	.0589	140
SIZE	6.00		.8992	.0502	162
SIZE	7.00		.8697	.0478	22

TOTAL CASES = 368

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