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ACCOUNTING TOOLS - FROM PREDICTORS OF INDUSTRIAL SICKNESS TO PREDICTORS OF SICKNESS IN PUBLIC ENTERPRISES

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ABSTRACT. The paper first reviews studies and experiences in India to delineate the concept of "Industrial Sickness" and to develop predictive tools (through accounting) for identifying "sick enterprises", including legislative enactments provided for their monitoring. It then reviews the overall research previously undertaken to analyze "business failures" through ratio analysis and predictive tools. An attempt is then made to apply some of these ratios to the financial operations of selected Ethiopian manufacturing enterprises, to analyze the incipient "sickness" that may prevail. The study concludes that the "financial health" of these public enterprises is highly questionable, as they are found to be heavily undercapitalized, facing liquidity problems and operating only on the upper part of the balance sheet. These factors endanger their continuing viability.

I. INTRODUCTION

The expression "public enterprise" is a term commonly used, but seldom meaning one and the same thing to every user. It may be subject to many interpretations, and can be defined inclusive or exclusive of various ideological and environmental conditions, spheres of economic activity, the traditional concept of public utilities, and the non-traditional present-day drive to control the upper echelons directing a country's policy in industry. Tremendous contributions have been made by the Boston Area Public Enterprise Group (BAPEG) and the International Center for Public Enterprise (ICPE) in providing research and literature on the nature, role and characteristics of public enterprise.

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The ICPE group of experts has especially provided extensive discussions on an deep analysis of the term "public enterprise". For the purposes of this paper, we shall use the term within the confines of the characteristics identified by that expert group in 1980, as

(a) the *public dimension,* which includes public purposes, public ownership and public control (based on scientific management and "accountability" accounting); and

(b) the *enterprise dimension,* which includes the field of activity of a business character, marketing of an output, and the involvement in investment and return [8].

Thus the meaning of public enterprise will here be limited to government-controlled enterprises intended to earn their revenue from the sale of goods and services, and operating as a separate legal entity and on a self-accounting basis [15].

Public enterprises are important instruments in building an industrial economy. They play major parts in policy to gyrate the wheels of progress in a country [10]. The life history of the development of an individual organism tends to retrace the history of its race [5], and this is true of the development of individual enterprises - they tend to retrace the growth, or otherwise, of the economy of a nation. It is the total sum of the health of the enterprises that makes up the health of that nation's economy.

Malperformance of public enterprise is likely to bring about national economic malaise and stunted growth, if not regress. Failure of an industrial enterprise, whether private or public, brings grievous economic consequences, for it produces substantial loss not only to creditors and owners but also to employees and to the community at large.

Many efforts have been made to develop models for predicting business failures, so that early warning indicators, useful and helpful for corrective measures, may be obtained. Prediction in advance of enterprise failure helps to identify causes of corporate failure or bankruptcy, or, as it has come to be called, "industrial sickness".

To avoid bottlenecks in economic growth and investment, and to improve public enterprise performance, it is indeed essential to identify "industrial sickness" and/or "public enterprise sickness" in advance, since they eventually cause colossal wastage of physical, financial and human resources. If public enterprise sickness can be predicted, we can prevent public enterprises from becoming permanent sources of financial hemorrhage in a nation.

1.1 Industrial Sickness in India

In recent years new literature has been building up, and much research work has been conducted on industrial sickness. In 1982 and 1984, research was carried out by the Reserve Bank of India to investigate the causes of industrial sickness in India. For example, in 1984, a study covering 378 industrial units there [3] revealed the following elements.

The Journal of the Institute of Chartered Accountants of India, *The Chartered Accountant,* devotes several articles to industrial sickness, covering a wide variety of its aspects, including attempts to clarify and develop the concept. They define the meaning of industrial sickness; make inquiries as to when an industrial unit may be judged sick; describe the symptoms and the causes of the sickness; and suggest steps to be taken in tackling or preventing the disease. Much of the research was first related to the private sector of industry,, but it was later extended to the public sector.

Causes of Industrial Sickness in
378 Enterprises in India

		Percentage
1.	Units which have gone sick because of mismanagement (management deficiencies including diversion of funds, in-fighting, lack of marketing strategy)	52
2.	Units sick because of faulty initial planning and other technical drawbacks	14
3.	Units sick because of market recession	23
4.	Units sick because of labour trouble	2
5.	Units sick for other reasons (power-cuts, shortage of raw materials, etc.)	9

Industrial sickness is not limited to a big or small enterprise, nor confined to a one industry. Its occurrence is not restricted to the developing countries, nor is it a phenomenon apparent only in the private sector. Yet it has quite a significant dimensional effect in a developing country, where capital is scarce [10, p. 333], and industry has a vital importance in the country's economic progress. In the early 1980s, extensive concern began to be expressed in India about "sickness" in industry, the multifarious factors causing it, the alarming increase in its incidence, and the implications for the economy. It was found imperative to revise and rehabilitate viable sick enterprises as quickly as possible, in order fully to utilize inherently productive assets, to optimize the use of

funds, and to salvage resources from enterprises which proved non-viable. There was increasing pressure on the Government of India to restructure the existing institutional procedures for the revival and rehabilitation of sick enterprises. As a result, a special committee was appointed by the government to identify causes of the sickness and to establish and implement remedial measures. The concern in industrial sickness did not remain a subject of mere academic interest and discussion, but was translated into practical, concrete measures when the Government of India in 1985 passed legislation named "The Sick Industrial Companies (Special Provisions) Act", which was made operational in 1987 (quoted by Kappoor, August 1987). The legislation states as its objectives.

- to secure the timely detection of sick and potentially sick industrial units;
- to speedily determine by a board of experts preventive, ameliorative, remedial and other measures to be taken;
- to make an expeditious enforcement of the measures so determined.

A sick industrial unit is defined as follows:

"... a unit (registered for not less than seven years) which has at the end of any financial year accumulated losses equal to or exceeding its entire net worth and has also suffered cash loss in such a financial year and the financial year immediately preceding such a financial year".

To qualify as a sick industrial unit, the legislation states that the unit must satisfy the following conditions:

(a) The unit must have been in existence for a minimum period of seven years.

(b) The figure of accumulated loss is equal to or its more than the net worth. Net worth means the sum total of paid-up capital and free reserve. Free reserve means reserves credited out of the profits and share premium amount (if any), but does not include reserves credited out of revaluation of assets, write-off of depreciation provisions, and amalgamation.

(c) The unit must have incurred some cash loss in the financial year in which the accumulated losses are equal to the net worth, and also in the financial year immediately preceding such a financial year. Cash loss means a loss computed without providing for depreciation.

The legislation also set up a board called the Board of Industrial and Financial Rehabilitation (BIFR), to follow up the implementation of the legislation.

The Board of Directors of any industrial unit is required by the legislation to inform the BIFR within 60 days from the date of finalization of the fully audited accounts of the company for the financial year at the end of which a unit has become a 'sick" industrial unit, and ask for the determination of measures to be undertaken. The BIFR is then expected to prepare within 90 days a scheme for reconstruction and/or rehabilitation; for the removal of or changes in management; for the amalgamation with other industrial units; for the sale or lease of a part or whole of an undertaking; and other ameliorative and remedial measures, including the giving of financial assistance or winding-up the unit.

1.2 Concept of "Corporate Sickness"

Corporate sickness is implied in business failures, and its identification leads to a thorough analysis of the business involved, ultimately leading to a prediction of "industrial sickness". Describing corporate failures, Agrawal states, "In human life, sickness, bankruptcy and death are not welcome, but they do occur; so also, in corporate life, companies do fail sick, go into liquidation and die, much against the wishes of all concerned" [2]. The avoidance of enterprise failures is a part of a manager's task, quite as important as the achievement of a success. Concern in preventing business failure, or enterprise failure, therefore, has long been required as an aim of management. Empirical research was first conducted on corporate failures in the U.S.A. by Winakor and Smith, in 1935, where corporate failure was regarded as synonymous with bankruptcy. Bankruptcy, however, is a legal event which has occurred at a definite point in time, evidencing an enterprise failure. This event is a culmination of failure which has happened several years before the bankruptcy. Its analysis is thus postmortem; and what is really wanted is the identification of contributing factors before they culminate in failure. For this, it is essential to devise a means of detecting "sickness" in its early stages, so that the management is alerted to find a timely remedy.

Like the human body, any enterprise, especially industry, is susceptible to sickness for various reasons, or its overall weakness in withstanding changes in environmental conditions. So long as sickness is scattered and sporadic, it is not a cause of social concern. However, when the sickness has "widespread incidence, it becomes a threat to the health of the national economy" [2].

In his book, Mikhail Gorbachev reminds us that even "socialist society is not insured against the emergent accumulation of stagnation tendencies nor even against major crises.... Changes are necessary, and,

as a result of *perestroika* (restructuring of the economy), closure of non-paying plants and factories operating at a loss" will be essential [11, pp. 51, 66].

1.3 Research for Predicting "Failures"

Several financial ratio models for predicting business failure are supposed to have been available since 1960, but banks did not start to use failure-prediction methods in credit analysis till the early 1980s [2]; Khan's review of attempts to develop predictive methods for distinguishing business failures quotes several examples, as follows" (quoted in Khan and Gorbachev, October 1985):

1. P.S. Patrick in 1932 made a random selection of 19 failed firms, and compared them to 19 non-failed firms on the basis of financial data, ascertaining that financial ratios were important tools in establishing significant relationships which could yield distinguishing characteristics.

2. A. Winakor and B.F. Smith in 1935 studied 183 failed firms, using 31 different ratios, and concluding that the ratio of working capital to total assets was a steady and accurate indicator of unfavourable financial trends. This was confirmed by C. Merwin [1942].

3. W. Beaver in 1967 employed a multi-variate model comparing the mean values of each financial ratio for failed and non-failed firms, defining failure as the inability to meet financial obligations when due. Seventy nine failed firms representing 38 different industries were selected from *Moody's Industrial Manual* for the period 1945-1964, and were matched by industry and size to a paired sample of non-failed firms, with the object of providing some control over extraneous factors. Beaver started with 14 ratios based on popularity

in the literature, in the performance of previous studies, and in the relationships in his cash-flow concept, which defined solvency in terms of maintaining a reservoir of liquid assets to meet obligations as they matured. From 14 ratios, 6 were selected on the basis of classification. These will be discussed later in more detail, and comprise

1. cash flow to total debt;
2. net income to total assets;
3. current and long-term liabilities to total assets;
4. working capital to total assets;
5. current ratio; and
6. no-credit intervals.

The ratio was calculated for five years before failure. Each of the resulting 30 ratios were arranged in ascending order for both failed and non-failed firms, to provide a cut-off point. Beaver found the best performance ratio to be cash flow to total debt. His significant contribution is the ability, with a simple model, to predict failure up to 5 years before it occurs.

4. E.I. Altman's work [1968] involved the use of a multiple discriminant analysis - a statistical technique for distinguishing defined groups. It transforms the multidimensional characteristics of a population into a single dimensional measure. Altman's sample consisted of 33 firms that had filed bankruptcy. To these were added 33 non-bankrupt firms, which were randomly selected and matched with the bankrupt

firms by asset size and industry. Starting with 22 original variables, Altman selected 5 that yielded the best discriminant function. The five variables were (a) working capital/total assets; (b) retained earnings/total assets; (c) earnings before interest and taxes/total assets; market value of equity/book value of total liabilities; and (e) sales/total assets. The significance of Altman's work lay in the ploneering use of several ratios together to assess financial condition. The overall accuracy of this model was greater than that of Beaver's model, but only for the first year prior to the bankruptcy.

5. R.G. Moyer in 1977 re-examined Altman's model and drew important conclusions, inserting a varying for caution in the eclectic application of Altman's model.

6. E.B. Deakin in 1972 tried to combine all Beaver's 14 ratios to develop a discriminant function (Altman's technique), and a sample selection procedure which was different from Altman's. Deakin observed a significant drop in accuracy when any one of the ratios was excluded.

7. R. Libby in 1975 examined the ability of the bank loan officers to detect failures by using financial ratios. Libby started with the set of 14 variables which was used by Deakin, but reduced the set to 5 independent sources of variation of analysis of the principal components. These variables were (a) net income over total assets; (b) current assets over current liabilities; and (c) sales over current assets. Libby concluded that the bankers' predictions were quite accurate.

8. A.R. Abdel-Khalik and K. El-Sheshai found an enhanced predictive capacity with a multi-variate model, which was derived from statistically selected variables to confirm a "better than naive predictability for loan officers".

All the above studies indicated the importance of financial ratios as a useful input in relevant predictor variables, though they do not provide for selecting optimality, nor for establishing cut-off points [14).

1.4 Industrial Sickness - Many Facets

In the process of these researches, important developments were marked in forming new views. First, not only was the significance of financial ratios in analyzing failures being established, but also a shift was occurring from delving into failures to identifying the causes of symptoms of failure due to sickness, and thus recognizing sickness before it culminated in failure. Second, there was an increasing use being made of accounting tools to identify significant variables for predicting sickness. Much of the research concentrated on industry, and so gave rise to the term "industrial sickness".

Industrial sickness may be viewed differently by groups with different interests, such as owners, creditors, consumers, financiers, employees, the government (i.e. the Ministry of Finance, whether as investor or as tax collector), and society in general. Thus it is a difficult task to draw a line of demarcation about which unit may be considered healthy or sick, and when.

An enterprise is a dynamic organism of man-machine-material. The middle and operating managers are the eyes and ears of the industrial enterprise. Through them, the organization is supervised, and obtains its policies and plans to be executed by the labour force. If the work force's legitimate interests are not met on time, the workers may not contribute their best to the organization. If they feel dissatisfied and insecure, the enterprise will exhibit physical sickness. If goods produced are not in line with consumer needs, the bulk of working capital will be tied up in the inventory, while a change in consumer demand will adversely affect profitability.

An enterprise may be earning adequate profits to meet current liabilities, but may yet be potentially sick because of its inability to provide depreciation from revenue. Soon, such an enterprise will have its machines worn out, without replacements. Conversely, a unit may not be making enough but still be healthy. It is said that sickness is bound to exist in the life of any industrial enterprise. This is a "painful reality of ... the process off industrialization" [12], especially in advanced economies, as it gets triggered by technological obsolescence and market forces. There must be provision made in anticipation of impending sickness.

Capital is the life-blood of enterprise. But, as much as under-capitalization does not permit healthy functioning or long survival of an enterprise, indiscrete transfusion in the form of heavy doses of capital can made an enterprise over-capitalised, leading to a meager rate of return. An over-capitalised enterprise is like a person who has the disease of elephantiasis - he is unable to carry his own weight.

Yadav (October 1986) differentiates between signals and symptoms of sickness in an enterprise, as it moves from a healthy state to a tendency towards sickness, and then to incipient sickness and sick condition (See the illustration below).

Signals and Symptoms of Enterprise Sickness

Signals			Symptoms
Healthy State	Tendency Towards Sickness	Incipient Sickness	Sick
-	Frequent breakdown plant and equipment	-	Persistent shortage of of cash
		-	Continuous decline in financial ratios
-	Non-submission of data to banks	-	Continuous decline in market price of shares
-	Irregular bank acts	-	Use of creative accounting
-	Default in payment of statutory dues	-	Delayed payments, Non-provision of accrued liabilities
-	Decline in Capacity utilization	-	Frequent requests to banks for loans
-	Technical efficiency,	-	Low morale of employees,
	Financial ratios	-	Delay in audit of annual accounts
	Market price of shares		
	Quality of product		
-	Turnover of personnel		
	↑		↑
	SIGNALS		SYMPTOMS

Source: R.A. Yadave, "Sick Industrial Companies Legislation - Remedy or Palliative?", *The Chartered Accountant,* Journal of the Institute of Chartered Accountants of India, October 1986, p. 292.

Rai (June 1987) groups the causes of industrial sickness into (a) external and internal; (b) controllable and uncontrollable; and (c) managerial, financial, production, technological, labour, government policy and others.

Plainly, every adverse factor cannot be predicted through accountancy, though some do get reflected in the financial statements in an indirect way - through capital, inventory or liquidity. It is imperative to realize the limitations in predicting sickness solely through accounting tools, without appreciating other devices as well. However, we can see how the accountant is well equipped to warn of danger signals and note factors which need correction.

1.5 Determining Sickness Through Accounting Tools

Current studies consider industrial sickness in terms of cash flow and financial imbalance and unprofitability. It is believed that sickness can be identified through monitoring the process of working capital, cash losses and erosion of net worth.

According to the reserve Bank of India, which made extensive studies from 1980 to 1985, a sick unit is "one which incurs losses for one year, and which in the judgement of the bank is likely to continue to incur losses for the current year as well as the following year (usually for a continuous period of three years); and which has an imbalance in the financial structure, such as a current ratio of 1:1 and a worsening debt-equity ratio" [16].

Some study teams have defined a sick unit as a unit in which the financial condition and other circumstances are such that it is not in a position to meet its current liabilities out of its current assets, while others have defined it as a unit which falls to generate internal surplus

on a continuing basis, but depends for its survival upon frequent infusion of external funds [16].

Cash Flow

An enterprise is considered sick if it has been incurring cash losses for a given continuous period (3 years). This is usually measured in terms of outflow of cash resources on a continuous basis, thus impairing the liquidity of its current assets, and leading to a shortage of working capital and a distortion of its debt-paying ability.

Financial Imbalance

Imbalance in the financial structure of an enterprise results in the following circumstances:

(a) When the ratio of current assets to current liabilities is 1:1, meaning that the whole of the current assets are being financed out of the current liabilities, and, as the unit incurs any cash loss, the current ratio may be less than 1:1, and the creditors' funds may be lost. A considerable degree of risk is involved when business is financed to a large extent by creditors. Any drop in sales volumes and/or retarding of the velocity of collection of receivables may make it impossible for a business to meet its obligations, which will lead eventually to insolvency, as the enterprise is unable to meet its current commitments.

The temptation to trade on equity is very great, but the risk involved therein even greater in a period of uncertainty. There can be instances where even a business with a high current ratio may not be in a position to pay current liabilities, because of unfavourable distribution of current assets in relation to liquidity.

The quality of short-term assets is a pervasive factor in the interpretation of current ratio.

(b) An enterprise requiring little investment in fixed assets may require small permanent capital; thus the ratio of capital to liabilities may be justifiably low, with more risk being borne by creditors. But in an enterprise requiring a large fixed assets investment, it is necessary that owners should take more risk than creditors, i.e. capital should be greater than liabilities. If the ratio of capital to liability is going below 1:1, it indicates the possibility of danger. In a long-term financial analysis, debt/equity ratio is important, while current ratio is important in analysis of a short-term financial position.

Profitability

A good enterprise, or a healthy enterprise (not a sick enterprise), is one that has good profitability as well as a sound financial position. Only one or the other of these factors does not make a sound and healthy business enterprise. If the management wants to maximize its profitability, it can do so by improving its net profit ratio and its turnover ratio; here, net profit ratio refers to the margin made in sales, whereas turnover rate shows the utilization of the capital in making sales. This has been depicted in formulas for return on assets (ROA) and return on investments (equity) (ROI). The formulas, which highlight the managers' concern in profitability and the financial position of the enterprise, are shown below.

Profit / Revenue	x	Revenue / Assets	=	Profit / Assets	x	Assets / Equity	=	Profit / Equity
Margin		Assets Turnover		ROA		Leverage		ROI

These formulas might be used with various adjustments to estimate the surplus necessary to provide for asset replacement and even for working capital needs. To ignore public enterprise and non-profit organizations' needs for a surplus is to ask enterprises to risk financial failure - a situation which a society can ill afford [20]. With the present inflationary circumstances, current generation of surplus is necessary for providing working capital and for replacing current value; but the basis for estimating current value must not be the historical value for the assets used.

In the prediction of sickness by accounting tools, there are two key tools which have come to be known through the research of Beaver and Altman. In his study of American companies, Beaver identified six ratios, as we mentioned previously, which are now considered of predictive value:

- cash flow to total debt
- net income to total assets
- total debt to total assets
- net working capital to total assets
- current assets to current liabilities
- no-credit intervals, computed by quick assets less current liabilities/operating expenses

Cash flow comprises net income plus depreciation; total debt means long-term plus short-term liabilities. New working capital comprises current assets less current liabilities.

It is reported that, in the Indian context, the following ratios were found to provide danger signals quite satisfactorily three years ahead of the actual failure of an enterprise [16].

- **Net working capital to total assets.** This ratio declines from the third prior to failure, and may even be negative because of mounting liabilities.

- **Retained earnings to total assets.** This ratio falls steeply from the third year prior to the failure, indicating that reserves are not growing, and that fewer funds are ploughed back into the business. Reserves might also be used instead of retained earnings, except when the reserves are from the revaluation of assets.

- **Earnings before interest and taxes.** This declines considerably from the year prior to the failure, indicating that the profitability is declining sharply. The ratio of net income to total assets also exhibits a similar tendency.

- **Market value of equity to total assets.** This exhibits significant decline in the second year prior to a failure, showing that the market is aware of the dwindling fortunes of the company. This is not applicable to public enterprises.

- **Total debt to total assets.** This exhibits and increasing trend in failing companies from the third year prior to failure, mainly because of increasing current liabilities, whereas, in successful companies, the ratio declines, indicating growing assets at the same level of debt. The importance and implications of this ratio should be carefully noted here. Later, we shall see how significant the analysis of this ratio is in Ethiopia public manufacturing enterprises.

- **Cash flow to total debt.** This ratio exhibits a sharp decline from the third year prior to failure, indicating higher interest charges, and therefore a lower cash generation to be calculated.

Strong association was also found to exist in Gupta's empirical test between sickness and a weak equity base [12, p. 703].

Fund Flow Analysis

This analysis views the enterprise as a reservoir of liquid funds, which is filled by inflows and drained by outflows. Thus, fund flow analysis is made to examine the following propositions:

- the larger the reservoir, the small the probability of failure;
- the larger the account of debt held, the greater the probability of failure;
- the larger the cash operating expense, the greater the probability of failure.

Caution

There is no question about the factual evidence that accounting tools can be important in analyzing and predicting enterprise sickness. However, we should be aware that accounting tools should not be seen as conclusive evidence pointing to a failure, because the ratios do not necessarily give precise evidence. They are useful only as signals pointing to possible distortion that may occur. Conventional ratios by themselves, without specific screening, are inadequate to predict a failure. But ratios specially evolved, through time, help to signal dangers.

A problem also arises with the ratios when a management starts to "window-dress"* them - to try to make the appearance of the enterprise more attractive. Their predictive value is undermined by this, causing the requirement of more and other non-financial devices to discern failure. Of course, norms for liquidity as well as other norms need to be developed in each context, before the predictive value of any ratios can be considered. For example, although, in industrialized countries, the liquidity ratio is seriously considered to be a sign of impeding danger, in less developed countries, where there is a limited liquid fund available to meet operating expenses (because large inventory holdings, current liabilities as trade credits, and short-term loans are the main sources of finance), the liquidity ratio cannot be expected to be high.

In spite of the cautions offered above, the significance of selected ratios should not be neglected. Many researches made on the prediction of industrial enterprise sickness repeatedly indicate that mounting debt accompanied by poor profitability and liquidity is definitely a signal of impeding failure. Fund flow analysis is also a broad indicator, but unless accompanied by carefully examined ratios and other non-financial devices, it cannot by itself predict a failure.

1.6 Reliability of Financial Data

The data necessary for the ratio and fund flow analyses are available only in published financial statements. Before even an approximate interpretation can be made, we must remember that the computation and preparation of the fund flow figures themselves are only as accurate as the financial statements. But are the data and statements presented reliable and useful in predicting failure, when we consider the differences

*The term refers to an accounting method used to improve cash position of a firm.

in data presentation resulting from inflation and management attempts at "window-dressing"? As conventional accounting is prone to show assets (fixed assets) at historical cost, ratios computed on such assumptions will certainly be misleading in relation to the rising trend of prices. In addition, management tendencies towards overvaluing the inventory through alternative methods of Generally Accepted Accounting Principles (GAAP), or disregarding repair and maintenance costs, or treating extraordinary incomes as ordinary, or ordinary expenditures as extraordinary, with a view to improving current income. Sometimes, on the other hand, the situation is presented less favourably than it is in fact, in order to minimize a tax. Because of these data manipulations, the reliability of financial statements needs to be investigated, to make sure that they accurately portray the financial position of an enterprise before they can usefully be used in an analysis of ratios and fund flow.

The accounting process and methods have to be improved, and accountants must contribute more to the presentation of financial statements. Conventional accounting procedures must be developed to suit a given context. Auditors, too, have a lot to contribute to the improvement of the reliability of financial statements; they are in a good position to highlight poor financial status and the probability of failure. Perhaps financial reporting standards or government regulations concerning them should require enterprises to include accounting ratios of predictive value for 3-5 years, just as there is now pressure on financial statements to show the effect of inflation. In Ethiopia, a good start has already been made, as the new Ministry of Industry Accounting Manual requires the intermittent computation of certain financial ratios. However, these are performed only for internal report purposes, and are seldom implemented in practice. In developing countries, where the accounting and auditing profession is at an early stage of development, much effort is needed to strengthen the accounting procedures to enhance the reliability of financial data.

1.7 Monitoring the Financial Affairs and Viability of Public Enterprises in Ethiopia

Might there then be a possibility of identifying "sickness" in Ethiopian public industrial enterprise by following lines of thought similar to those on the improvement of accounting? Perhaps the Indian experience of legislating for the identification and rehabilitation of sick industrial units should be given consideration in our concern to improve the performance of public enterprises. It is the thesis of this paper that ratio and fund analysis might be applied to the examining of public industrial enterprise sickness, and to suggest remedial action so that these enterprises may be prevented from being a source of national financial hemorrhage. But, first, the financial information about them must be made reliable. This requires development and improvement in accounting standards and practices.

Article 9 of Proclamation 163 of 1979 (A Proclamation to Provide for the Regulation and Coordination of Public Financial Operations, Negarit Gazetta No. 12) states that (a) if a public enterprise of a financial agency incur a loss for 3 consecutive years, or (b) if its loss remaining in excess of the general reserves equals 30% or more of the state capital, "the Minister or a supervising authority shall cause the financial affairs and viability" of such an enterprise to be investigated. The Proclamation goes on to say that, if the investigation reveals non-viability, and the loss written off equals 50% or more of the state capital, the Minister or the supervising authority shall recommend *dissolution of the enterprise* to the Council of Ministers. Further, Article 9.3 provides a means for rehabilitating enterprises if the investigation reveals the possibility of long-term viability. Is it the intention of this Proclamation to provide for monitoring public enterprise sickness?

So far, I have not found any serious attempt to implement this provision, and I am not able to give examples of investigations

undertaken, or dissolution of an enterprise recommended. If there were to be attempts to implement this provision, we can even now see how the Article lacks well-formulated financial parameters for instituting an investigation, except for loss and other somewhat subjective criteria. If we compare the Ethiopian legislation to the Indian legislation, the Ethiopian Proclamation is far from putting forward concrete means of implementation. There is no doubt that the intention is there, but the instrument stops short of providing mechanisms for implementation.

In his paper presented at the National Symposium on Industrial Development in Ethiopia (June 1986, p. 250), D.H.J. Siviter indicates that 26 enterprises under the Ministry of Industry had *negative capital,* either from the date of establishment proclaimed, or as a result of subsequent losses; while a further 10 plants had large accumulated deficits. It was moreover stated that the Ministry had asked for Birr 18 million (U.S.$1 = Ethiopian Birr 2.07) to be allocated to rehabilitate enterprises that were in a very poor financial condition; whether the request was based on results of an investigation, I am not sure. Unfortunately, national research is not privileged to have access to information needed to confirm the magnitude of these losses, nor to follow up and report as to what has happened to the loss-making enterprises since then.

1.8 Analysis of Financial Ratios in Public Manufacturing Enterprises in Ethiopia

Under a research grant funded by Organization for Social Science Research in East Africa (OSSREA), a computation and analysis were made of 7 financial ratios in 12 public manufacturing enterprises in Ethiopia for the periods covering 1976, 1977-1979 and 1981 (5 years). The results are expected to be published in an occasional paper from OSSREA. The ratios covered in this research were as follows:

1. net worth to total assets;
2. debt to net worth;
3. current ratio;
4. fixed assets to total assets;
5. sales to total assets: expressed in number of times turned over;
6. sales to inventory (number of times turned over);
7. net surplus to total assets.

The financial ratios were computed on the corporations' financial statements, and not on data from each enterprise. One of the problems of specifying the number of public enterprises in the developing countries is that the unit base of analysis of a public enterprise may be the corporate unit, which may have several enterprises or plants in it, or, on the other hand, the unit may consist of one individual enterprise. For example, the Ethiopian Textile Corporation might be considered as one public enterprise or as 13 enterprises, taking into consideration the 13 plants within it; and the Beverage Corporation might be seen as one public enterprise, or as 25 enterprises. To be of any value for prediction of industrial sickness, the financial ratio analysis should be based on individual enterprise accounts, not on a collective group of enterprises, for three reasons: the analysis would be much more "microscopic"; comparative norms would be more accurate; and further corrective and ameliorative action might be more meaningfully developed. But this was not possible, because of lack of access to data in each individual enterprise.

The ratios covered above were not all the same as those 6 ratios in Beaver's model (January 1967) which are considered to be of predictive value. The majority of the above ratios are similar to each other, and can thus overall provide some signals of the state of health of the public manufacturing enterprises in Ethiopia. In order to bring the exercise more into line with the experiences in India and in Beaver's model, attempts were made to compute additional ratios, such as net working capital to the total debt, and also to the "no credit interval" ratio. However, the cash flow to the total debt could not be computed, as thee depreciation allowances are to a large extent unreliable, and details are absent. The "no credit interval" formula could not be used, because, for the most part the quick or short-term assets are less than the current liabilities and are therefore negative, except for those of the Ethiopian Sugar Corporation, which seems to have this ratio rising until 1980, showing a strong liquidity position. But by 1981 the Sugar Corporation also exhibits negative short-term assets, and the ratio is therefore incomputable.

Apart from trying to assess the financial ratios, we may examine thee public enterprises in Ethiopia through some of the signals and symptoms listed by Yadav [October 1986]:

(a) persistent shortage of cash;

(b) delayed payments (of obligation, i.e. taxes, charges on capital including waivers or postponement);

(c) frequent requests for bank loans;

(d) postponement or avoidance of making provision for accrued liabilities, or provisions for valuing assets realistically, i.e. bad debts; and

(e) frequent delay in audit of accounts.

If we find these signals, as we do, we may identify the incipient sickness of the public enterprises examined.

1.9 Ratio of Net Worth to Total Assets

The ratio of net worth to total assets in the public manufacturing enterprises in Ethiopia has been observed on an overall average to be 0.41; in the period examined (1976-1981), it decreases from 0.57 to 0.27, and it is constantly declining in all corporations (Table 1). This implies that the assets of the enterprises have been rising not from an increase in equity fund, but rather from an increase in borrowing. Enterprises are thus heavily indebted, and have a narrow equity base, with 60 - 80% of their assets supported by debt financing. There may be nothing wrong in using a debt fund to operate on, as long as the profitability rate in the enterprise can more than justify the interest and financial charge requirements on the borrowed funds, and, if justification is present, it is a positive leverage. But the crucial question is, do the profitability and operation of the enterprise justify such heavy indebtedness.

When we find that 60% or more of the total debt in these enterprises is in current liabilities, as we shall see later, there is cause for worry. Short-term loans are sometimes even being used to finance fixed assets or long-term objectives, instead of the other way round. In the long-term, such financing puts an increasing burden of risk on the creditors; and it limits also the borrowing capacity of the enterprise.

Might it be said that public enterprises should be able to afford more borrowing, or should assume more debt in their finances than is possible with private enterprises, since borrowing by public enterprises comes from another side of the government pocket - the bank? Some observers may even be tempted to ask, Is it material whether a public enterprise

obtains its funds from borrowing (either from banks or creditors), or from the state directly (as a government investment from the treasury)? Is it not like obtaining a loan from two sides of the same pocket, or from two pockets of the same owner, the state? In such a case, the criteria and measurement of enterprise efficiency then become illusive, and the concept of returns and investment becomes blurred.

1.10 Methods of Financing

There are two main sources of finance available for any enterprise or firm: these are debt and equity. Although equity can be increased by either additional equity fund investment (sale of equity or otherwise), or through internally generated forms, the latter is not usually available for most public enterprises, as any surplus is disposed of by various central government regulations and restrictions, including the requirement of the return of any residual surplus from the enterprise concerned to the central treasury. For example, in Ethiopia, in accordance with the Proclamation of 163/1979, the surplus of the public enterprises is siphoned away in the form of capital charges, taxes, and the payment of any residual surplus to the Ministry of Finance. Thus, in principle, no income (surplus) is retained or left to the enterprise's discretion. The use of a reserve by the enterprise is also constrained by a legal provision. Increasing equity capital through an additional equity investment is not an easily accessible method of financing a public enterprise, because the government has too many demanding projects to fund from an already constrained budget, and cannot increase the equity of a public enterprise as desired. Thus, the easiest way from a public enterprise to meet its fund need is to revert to a debt, either a short-term or a long-term debt, or both. Public enterprises are not subjected to a strict financial scrutiny, not to evaluation and screening, as private enterprises are, on borrowing and/or on their request for a loan, especially from banks; public enterprises are exempt from such attentions, since they are considered to be part of the state ownership. The tendency of public enterprises to

borrow thus becomes frequent, not sporadic nor temporary. With various special government rules for forgiveness of a debt, waiver, or even the turning of a debt into subsidy which is written off against a revenue expenditure, it becomes impossible to discern and to subject to proper financial discipline the structure of a public enterprise. Thus, as was indicated earlier, an increasing debt promotes a weakening equity base and greater risk, leading towards a sickness.

1.11 Ratio of Debt to Net Worth (Debt to Equity)

The ratio of debt to net work for the public manufacturing enterprises in Ethiopia is observed to have an overall ratio of 9.04 (Table 2). This ratio has been constantly increasing for all the enterprises in the overall periods studied, indicating an increasing leverage or a greater use of debt funds. The highest ratio, to the extent of 413.30, is seen in the leather and shoe industry. With a high degree of financing from debt, not only is the rate of return to the owners threatened, but also there is a risk that the given enterprise may not earn enough to meet its interest payments on a debt; this factor results in a negative leverage, the effect of under-capitalization. I am sure that there are those who may argue that these public enterprise debts come from bank loans, and, if the banks are local, they are themselves public institutions and government-owned. However, if we think of the borrowings made by enterprises for foreign-purchased and imported production components, we can soon comprehend the burden of debt payment and foreign exchange brought about by debt financing.

1.12 Current Ratio

The current ratio observed in the Ethiopian public manufacturing enterprises shows an overall average of 1.60 ratio, which is not unfavourable, as it is above 1.00 (Table 3). A ratio of 1.00 or above indicates that it just barely covers the current obligation, without allowing

room for any changes in a conversion of current assets. The current ratio in all these Ethiopian enterprises or corporations, however, has been decreasing over the time of observation. The decrease in the current ratio from the previous period seems to come as a result of an increase in the current liabilities, or due to an increase in the current liabilities faster than in the current assets, a factor showing indulgence in the use of current liabilities to meet working capital needs. This trend indicates a liquidity problem. The favourableness of the current ratio depends on the composition of the current assets; in Ethiopia, an examination of the composition shows that an overall of 50% or more of the current assets is in inventory or stock, followed by receivables. The liquidity of the current assets is judged by how easily the stock is saleable, and how quickly the receivables can be collected. If the inventory value is overstated, and if the inventory composition itself is misrepresented by an inaccurate inventory definition and a classification improperly identified (i.e., if an inventory is composed of obsolete stock, or Letter of Credit (LC) is transit, or supplies for consumption), then the inventory is far from being assured of a sound position. The same concern can also be noted in the quality of receivables. If receivables are classified in the current assets, including receivables whose terms of collection is uncertain, so that thus the value is definitely unknown, then the current assets will be overvalued and the current ratio is fictitiously overstated. The liquidity position is then much more risky. Since the financial data examined from 1976 to 1981 were prepared before the issue of the accounting procedures manual issued in 1987 by the Ministry of Industry, the reliability of the data is also questionable. Here, we can appreciate the importance of adopting uniform accounting guidelines on the classification and valuation presentation, including the definition of terms for the preparation of better and more meaningful financial statements, and leading to a more adequate interpretation of financial data.

1.13 Ratio of Fixed Assets to Total Assets

This ratio indicates the amount of investment tied up in fixed assets. What portion of the total investment an enterprise or a corporation puts in fixed assets depends on the type of activity it is engaged in and the industry it is in. Normally, in a heavy industry type of activity such as in metal and steel, a high percentage of the ratio between fixed assets and total assets would be expected; while in light industries, such as iron on construction industries, the opposite would be true. In the Ethiopian manufacturing enterprises, it is noted that the percentage of fixed assets to total assets is overall 20-30%, ranging to as low as 16%.

The Ethiopian ratio exhibits also a constantly decreasing trend throughout the period observed in all the corporations. Examining the numerator and denominator of this ratio, we observe that the increase in the total assets or investments does not result in fixed asset increases, but rather in current assets (circulating assets) activity. It is not easy to interpret this relationship by itself, in the absence of a standard of comparison with the average of some specific similar activity in the same environment. But it is certainly doubtful that the Ethiopian ratio adequately represents the enterprises' sphere of activity, or wise financial allocation to the different types of assets, as manufacturing enterprises are customarily expected to require a rather larger fixed capital investment in their activity.

Overall, the portion of investment in fixed assets seems to be relatively low, indicating that most of the increase in the total assets has come as a result of an increase in the current assets. More is being spent on the current assets than on long-term investment. Given this situation, we can observe from the financial statements that there has been little or not change in the long-term liabilities, but there has been a fast increase in the current debt; it is evident that more activity is concentrated on the current assets, especially on the inventory build-up.

This indicates a short-term objective, and not long-term strategy, and it does not say much for the increased production at the cost of the long-term utility value of a plant and machinery, and other fixed-asset types of investment.

1.14 Ratio of Sales to Total Assets (Asset Turnover)

Asset turnover is the ratio of sales to the total assets, that is by dividing the sales into the total assets, and is expressed as number of times turnover, indicating the volume of sales generated by the total assets invested. The greater the amount of turnover, the higher the efficiency of the asset utilization. In the Ethiopian manufacturing enterprises examined, overall, on the average, the turnover was less than 1.00, or at most close to 1.00 (Table 5). this is not what would be considered efficient utilization of investment. The volume of sales generated by the investment is relatively small, although it can vary from industry to industry, from enterprise to enterprise, and from period to period. Especially when the turnover rate is below 1.00, this rate is not only a sign of inefficiency, but also a sign of difficulty in operating the enterprise.

1.15 Relationship of Sales to Inventory Turnover

The relationship of sales to inventory turnover expresses the number of times the inventory has been "turned over" or replenished through the volume of sales attained. The larger the turnover and the faster the inventory moves shows that the quality of the inventory leads to increasing liquidity. The turnover also indicates the extent of the capital tied up in the inventory, for, if the turnover is small, more capital is tied up in the slow-moving inventory. Naturally, the rate of any turnover will vary, depending on the type of activity and industry the enterprise is

engaged in. It is usual to find an inventory much higher in a retail industry than in a manufacturing industry.

The inventory turnover for the ethiopian manufacturing enterprises observed had, overall, an average of 2.2 (times), and it showed a decreasing trend in almost all the enterprises (Table 6).

It is possible here to raise a question as to whether we can expect as large a turnover in public enterprises as in private enterprises. By itself, the whole of the Ethiopian inventory turnover studied seemed to fluctuate in the neighbourhood of 1.00, except for the Food and Beverage Corporations, which have been able to exhibit a high turnover of from 3 to 4 (times). From the relationship of sales and inventory, it may be inferred that a low turnover occurs as a result of larger inventory holdings relative to the sales, i.e., sales have not been able to increase as fast as the inventory holdings. But the question as to why the inventory holdings have been increasing faster requires further inquiry into the activity. Perhaps the holdings have been increased in anticipation of expected shortages, or to meet an expected increase in demand, or simply to meet and executive order for a given production or target requirements such as those set by supervising ministries of enterprises under their jurisdiction. It is also possible that the method of inventory valuation may be questionable, and that the inventory content is overstated, because supplies and other consumable items are included in the inventory. Sharp distinctions in the definition and classification of an inventory are not observable in the accounting practices of Ethiopian public enterprises.

Other reasons for the low turnover may be found in the depressed sales related to the rising costs of inventory and production.

1.16 Ratio of Net Working Capital to Total Assets

As stated earlier, research in the Indian experience indicates a decline in the ratio of net working capital to total assets three years prior to failure of the enterprises studied. In the Ethiopian public manufacturing enterprises, this ratio is found to have, overall, an average of 0.22, and it is constantly declining in the majority of the corporations, except those of Tobacco and Matches, Sugar, Printing, and Wood Works, all of which exhibit changing patterns. The ratio is in general too low, to a low of 0.02 (Building Materials) from a high of 0.55 (Tobacco and Matches). The decline in such a ratio is the sign of a liquidity problem, and increasing difficulty in operations, as the growth in the total investment is being obtained with an increasing debt, without generating a sufficient internal or equity fund to meet the obligations incurred.

Taking into consideration the other non-financial signals and symptoms of enterprise sickness, indicated earlier in the illustration from Yadav (October 1956), we can discern the following factors:

(a) A persistent shortage of cash is visible in the low-liquidity ratios and liquidity problems noted in our public enterprises.

(b) Delayed payments of obligations are visible in the taxes payable and capital charges payable; in the residual surplus payable that appear on the balance sheet of state enterprises in Ethiopia; and in requests forwarded by the corporations within the enterprises to the Ministry of Finance for a waiver or postponement of these payable.

(c) Frequent requests for bank loans by the enterprises is observable in the heavy use of overdrafts and short-term borrowings, even for a payment of capital charges.

(d) Postponement and avoidance of making provisions for accruals such as interest and wages, or uncleared advances and/or the mixing-up of debts and prepayments, or outright failure to provide appropriately for bad debts and depreciation - all these are not only the means of dressing-up the financial statement and apparently improving the current position, but are also signals of an enterprise's operational difficulty in properly managing its assets and costs.

(e) Frequent delays in the auditing of accounts have been observed for a long period in public Ethiopian enterprises, either because of non-closure of books of accounts on time, or shortage of auditors, or simply because of the absence of adequate books and accounts.

Poor and inadequate accounting and financial information for decision-making are evident in the varying methods of surplus determination based on varying interpretations of and lack of guidelines on the computation of capital charges; on provisions for doubtful accounts; on losses; on the accumulation, use and recuperation of reserves; on costing; and on net surplus disposition or appropriation.

II. CONCLUSION

The creation of machinery to identify "public enterprise sickness" and to establish a mechanism to rehabilitate and nurture each enterprise is an important step in the right direction to prevent financial hemorrhage and to save national resources. To what extent the problem of public enterprise sickness and its associated difficulties are resolved depends on the manner in which the rehabilitation programmes of the potentially sick units can be handled, and on the accuracy of their timely identification of the sickness.

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Table 1

Ratio of Net Worth to Total Assets in
Public Manufacturing Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/81	Average
Beverages	0.69	0.57	0.33	0.29	0.29	0.43
Building Materials	0.72	0.58	0.42	0.29	0.17	0.44
Chemical	0.62	0.61	0.39	0.34	0.28	0.45
Fiber	0.51	0.37	0.32	0.21	0.16	0.31
Food	0.46	0.44	0.25	0.19	0.18	0.30
Leather and Shoes	0.28	0.21	0.12	0.05	0.002	0.13
Metal Works	0.49	0.33	0.25	0.23	0.26	0.31
Printing	0.52	0.45	0.29	0.30	0.31	0.37
Sugar	0.83	0.85	0.71	0.75	0.51	0.73
Textiles	0.54	0.50	0.37	0.36	0.38	0.43
Tobacco and Matches	0.77	0.72	0.71	0.51	0.49	0.64
Wood Works	0.43	0.38	0.39	0.43	0.24	0.37
Average	0.57	0.50	0.38	0.38	0.27	0.41

Source: Prepared from Ministry of Industry Data, in "Ethiopia: Recent Economic Developments and Future Prospects", Volume II, pp. 149-154. World Bank, 31 May 1984.

Table 2

Ratio of Debt to Net Work in Public
Manufacturing Enterprises in Ethiopia

Lines of Business	1976/77	77/78	78/79	79/80	80/81	Average
Beverages	0.43	0.77	2.07	2.44	2.42	1.63
Building Materials	0.39	0.73	1.37	2.40	4.80	1.94
Chemicals	0.62	0.63	1.50	1.95	2.63	1.47
Fiber	0.97	0.69	2.10	3.80	5.13	2.74
Food	1.19	1.29	2.90	4.38	4.55	2.86
Leather and Shoes	2.62	3.8	7.70	18.60	414.30	89.42
Metal Works	1.05	1.99	2.98	3.34	2.90	2.45
Printing	0.85	0.99	1.64	1.77	1.66	1.38
Sugar	0.20	0.18	0.42	0.33	0.97	0.42
Textiles	0.85	0.99	1.64	1.77	1.66	1.38
Tobacco and Matches	0.31	0.38	0.42	0.95	1.05	0.62
Wood Works	1.32	1.67	1.53	1.32	3.13	1.79
Average	0.90	1.28	2.25	3.63	37.10	9.04

Source: Prepared from Ministry of Industry Data, in "Ethiopia: Percent Economic Developments and Future Prospects", Volume II, pp. 149-154. World Bank, 31 May 1984.

Table 3

Ratio of Current Assets to Current Liabilities in Public Manufacturing Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/81	Average
Beverages	1.43	1.32	1.10	1.09	1.06	1.20
Building Materials	2.40	1.71	1.35	1.14	1.03	1.53
Chemicals	2.09	1.99	1.41	1.28	1.18	1.59
Fiber	1.34	1.30	1.22	1.10	1.06	1.20
Food	1.43	1.32	1.10	1.09	1.11	1.21
Leather and Shoes	1.83	1.60	1.28	1.13	1.13	1.39
Metal Works	1.90	1.43	1.35	1.27	1.31	1.45
Printing	1.74	1.61	1.74	1.17	1.25	1.50
Sugar	4.37	4.89	2.27	3.00	1.47	3.20
Textiles	1.70	1.70	1.41	1.38	1.36	1.51
Tobacco and Matches	3.36	2.90	2.90	1.69	1.62	2.49
Wood Works	1.26	1.18	1.30	1.46	1.14	1.27
Average	2.07	1.91	1.53	1.40	1.22	1.63

Source: Prepared from Ministry of Industry data, in "Ethiopia: Recent Economic Developments and Future Prospects", Volume II, pp. 149-154. World Bank, 31 May 1984.

Table 4

Ratio of Fixed Assets to Total Assets in Public Manufacturing Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/81	Average
Beverages	0.32	0.34	0.37	0.32	0.35	0.34
Building Materials	0.33	0.30	0.27	0.25	0.25	0.28
Chemicals	0.20	0.23	0.15	0.15	0.15	0.18
Fiber	0.34	0.266	0.25	0.17	0.13	0.23
Food	0.27	0.30	0.24	0.17	0.18	0.23
Leather and Shoes	0.42	0.36	0.32	0.25	0.22	0.31
Metal Works	0.14	0.12	0.07	0.06	0.06	0.09
Printing	0.20	0.16	0.12	0.17	0.16	0.16
Sugar	0.53	0.49	0.39	0.32	0.41	0.43
Textiles	0.26	0.23	0.25	0.24	0.27	0.25
Tobacco and Matches	0.21	0.18	0.15	0.18	0.17	0.18
Wood Works	0.30	0.26	0.23	0.17	0.14	0.22
Average	0.29	0.027	0.23	0.20	0.20	0.24

Source: Prepared from the Ministry of Industry Data, in "Ethiopia: Recent Economic Developments and Future Prospects", Volume II, pp. 149-154. World Bank, 31 May 1984.

Table 5

Ratio of Sales of Total Assets in Public Manufacturing Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/81	Average
Building Materials	0.66	0.61	0.60	0.67	0.69	0.65
Chemicals	1.26	0.84	1.27	1.05	0.99	1.08
Food and Beverages	1.43	1.24	1.20	1.25	1.25	1.22
Leather and Shoes	0.72	0.62	0.90	1.05	0.98	0.86
Metal Works	0.97	1.37	1.11	1.46	2.30	1.44
Printing	0.85	0.86	0.86	0.88	0.89	0.87
Sugar	0.38	0.30	0.53	0.49	0.43	0.43
Textiles and Fiber	0.90	0.71	0.84	0.99	0.98	0.88
Tobacco and Matches	1.07	1.04	1.09	0.93	0.95	1.02
Wood Works	0.93	0.87	1.10	1.01	1.07	0.99
Average	0.91	0.85	0.95	0.97	1.05	0.95

Source: Prepared from Ministry of Industry Data, in "Ethiopia: Recent Economic Development and Future Prospects", Volume II, pp. 149-154. World Bank, 31 May 1984.

Table 6

Ratio of Sales to Inventory in Public Manufacturing
Public Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/81	Average
Building Materials	1.50	1.30	1.40	1.50	1.80	1.50
Chemicals	2.40	1.70	3.10	2.20	2.30	2.30
Food and Beverages	4.80	4.50	4.40	3.90	3.60	4.20
Leather and Shoes	1.70	1.30	1.70	1.80	1.80	1.70
Metal Works	1.70	2.90	1.80	2.20	1.50	2.00
Printing	2.10	1.90	1.90	2.00	2.10	2.00
Sugar	1.70	1.70	2.10	2.20	1.90	1.90
Textiles and Fiber	2.10	1.30	1.60	2.30	2.10	1.90
Tobacco and Matches	2.60	2.60	2.30	2.90	2.20	2.50
Wood Works	2.50	2.30	2.50	2.10	2.50	2.40
Average	2.30	2.10	2.30	2.30	2.20	2.20

Source: Prepared from Ministry of Industry Data, in "Ethiopia: Recent Economic Developments and Future Prospects", Volume II, pp. 149-154. World Bank, 31 May 1984.

Table 7

Ratio of Net Working Capital to Total Assets in Public Manufacturing Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/81	Average
Beverages	0.39	0.25	0.07	0.074	0.089	0.17
Building Materials	0.08	0.29	0.19	0.09	0.02	0.13
Chemicals	0.41	0.38	0.24	0.18	0.11	0.26
Fiber	0.16	0.17	0.14	0.07	0.05	0.12
Food	0.22	0.16	0.07	0.07	0.049	0.13
Leather and Shoes	0.26	0.24	0.15	0.09	0.09	0.16
Metal Works	0.41	0.26	0.24	0.19	0.22	0.26
Printing	0.34	0.32	0.19	0.12	0.16	0.23
Sugar	0.37	0.41	0.34	0.45	0.18	0.35
Textiles	0.31	0.32	0.21	0.20	0.19	0.25
Tobacco and Matches	0.55	0.54	0.55	0.34	0.31	0.46
Wood Works	0.14	0.11	0.18	0.26	0.10	0.16
Average	0.30	0.29	0.21	0.18	0.13	0.22

Source: Prepared from Ministry of Industry Data, in "Ethiopia: Recent Economic Developments and Future Prospects", Volume II, pp. 149-154. World Bank, 31 May 1984.

Table 8

Ratio of Total Debt to Total Assets in Public Manufacturing Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/81	Average
Beverage	0.30	0.43	0.67	0.71	0.71	0.56
Building Materials	0.28	0.42	0.58	0.71	0.83	0.56
Chemicals	0.38	0.39	0.60	0.66	0.72	0.55
Fiber	0.49	0.63	0.68	0.79	0.84	0.68
Food	0.54	0.56	0.74	0.81	0.82	0.69
Leather and Shoes	0.72	0.79	0.88	0.95	0.99	0.87
Metal Works	0.51	0.67	0.75	0.77	0.74	0.69
Printing	0.48	0.55	0.71	0.69	0.68	0.62
Sugar	0.17	0.15	0.29	0.24	0.49	0.27
Textiles	0.46	0.50	0.62	0.64	0.62	0.57
Tobacco and Matches	0.24	0.28	0.29	0.49	0.51	0.36
Wood Works	0.57	0.63	0.60	0.57	0.76	0.63
Average	0.43	0.50	0.62	0.67	0.72	0.59

Source: Prepared from Ministry of Industry Data, in "Ethiopia: Recent Economic Developments and Future Prospects", Volume, II, pp. 149-154. World Bank, 31 May 1984.

Table 9

Ratio of Net Surplus to Total Assets in Public Manufacturing Enterprises in Ethiopia

Line of Business	1976/77	77/78	78/79	79/80	80/80	Average
Building Materials	(0.01)	(0.10)	(0.04)	(0.07)	(0.23)	(0.09)
Chemicals	0.11	0.005	0.12	0.08	0.06	0.07
Food and Beverages	0.10	0.05	0.05	0.04	0.02	0.05
Leather and Shoes	0.03	(0.04)	0.01	0.02	(0.02)	0.00
Metal Works	0.06	0.06	0.05	0.08	0.09	0.07
Printing	0.08	(0.79)	(0.10)	0.13	0.12	(0.11)
Sugar	(0.04)	0.02	0.07	0.09	0.05	0.04
Textiles and Fiber	0.06	(0.003)	(0.15)	0.05	0.04	(0.0006)
Tobacco and Matches	0.16	0.16	0.11	0.12	0.03	0.12
Wood Works	0.07	(0.01)	0.04	0.04	0.05	0.04
Average	0.062	(0.0648)	0.016	0.058	0.021	0.02

Source: Prepared from Ministry of Industry Data, in "Ethiopia: Recent Economic Developments and Future Prospects:, Volume II, pp. 149-154. World Bank, 31 May 1984.