CONCLUSIONS

Researcher intends here to briefly recapitulate the main findings of the study. The conclusions of the analysis are assessed along with their practical significance, and some related fields, where further research taken up by others would focus extra insights in the subject, are also suggested.

MAIN FINDINGS AND THEIR IMPLICATIONS

Industrial revolution has brought into existence number of large industrial houses all over the world and this has brought the people closer. The technological revolution started since mid of 19th century has given birth to one of the spectacular revolutions i.e. electronics. The technological advancements have given birth to major technologies in electronics i.e. computer, communications, and microelectronic.

Since independence, India has been in the midst of a vigorous and qualitative economic transformation. Consequently, Indian industries underwent significant structural changes and entered in hi-tech technological area i.e. electronics, specially in the eighth decade and thereafter of this century.

Costing system of a company not only affects its profit earning capacity, but, also enhances the productivity, efficiency and effectiveness of the workings of a concern or company, resulting thereby in the growth of the industry.

The present study has made an attempt to fill up the gap in the field of telecommunication and computer industry by
systematically analysing the cost accounting system.

GROWTH

Within just four decades of the invention of transistors in 1946, today the world is passing through change in electronics which is leading to convergence of computer, communication and microelectronics technologies. The electronics industry has expanded at a faster rate all over the world, i.e. on an average 13 per cent annually since 1980’s. The share of the developing countries was very insignificant in world production, and estimated to be about 12 percent for 1987. Among developing countries, China and India are leading in electronics production.

Indian government announced number of liberal and promotional policy measures and incentives to build an integrated, self reliant and vibrant electronic industry. These measures have resulted into remarkable growth during the last decade. The compound growth rate of 25 percent was achieved during 1980-85, which stepped up to 35 percent during 1985-90. The electronics exports have grown at a cumulative annual rate of 40 percent in 1985-90 compared to 27 percent during 1980-85. As a result of this, a large pool of technical manpower at various levels have been generated during the last decade, nearly 5,50,000 employments have been generated by 1989-90.

Telecommunication Sector

The first electric telegraph was invented in 1837 by Samuel Morse in America. A similar service was opened for the public in India in 1855. The British Raj had introduced telecommunication services in India for meeting requirements of colonial government
resulted into slow and uneven growth of the telecommunication services in India. The development of telecommunication services in India in a planned manner commenced in early 50s and enhanced thereafter.

The level of investment in telecommunication sector seems to be inadequate in India. India has invested 3 percent of GDP in 1982 as against 7 percent by France, Japan and Sweden. As against 50 phones per 1000 in the developing world, India has 5 phones per 1000 population. The government invested a total of Rs. 4873 crore till 1984-85.

Our national planners have realised the importance of telecommunication services and accepted the same as one of the infrastructure facility which directly helps the economy. The Planning Commission recommended an outlay of Rs. 10,570 crore for telecommunication sector in the seventh plan period (1985-90); however, only Rs. 6,000 crore has been allotted because of resource crunch.

India would require about Rs. 18,000 crore to improve the telecommunication sector in the eighth plan period (1990-95).

The share of telecommunication sector in total electronics production decreased from 18 per cent in 1981 to 17 per cent in 1987. In absolute rupee term it increased from Rs. 154 crore in 1981 to Rs. 1425 crore in 1989, registering a growth rate of 103 per cent annually over the period. The direct exchange lines (DELs) increased at an average of 21 per cent. The revenue from telecommunication sector increased at an average of 51 per cent and the labour employment increased by 13 per cent annually. The growth of telecommunication sector is remarkable.
The total demand by 2000 A.D. is likely to be around 20 million DELs connections. During the ten year period (1990-2000) total 21.75 lac jobs can be generated.

Computer Sector

Today's computer is based on working principles provided by Mr. Charles Babbage in 1890. Thereafter number of inventions took place, resulting into equipment becoming smaller in size and its cost has also reduced. A computer is basically a calculating machine, capable of performing billions of mathematical operations in a few minutes. Computer consists of two basic parts i.e. hardware (machinery) and software (programmes or instructions flow). Computers are generally of three kinds i.e. micro, mini and mainframe.

The first computer was installed in 1955 in India. Computers have progressively entered in almost all sectors of our economy after 1980. In the developed countries, on an average, computers contribute about 5 per cent of GNP. In India the contribution of computers to GNP is 0.13 per cent only. In the field of software development, India has achieved greatest success and it is estimated that software export will be Rs. 30 billion by the year 2000 A.D.. The computer industry can play a significant role in earning much needed foreign currency for the country. To promote the computer industry, government of India has announced number of promotional and liberal policies including Computer Policy, 1984.

The share of computer sector in total electronics production has increased from 6 per cent in 1985 to 8.5 per cent in 1989. The growth of computer industry was 44.59 percent while the growth of
hardware sector was 42 percent and of software sector was 89 percent in 1989-90.

The estimated demand for computer in 2000 A.D. is 4.21 lac units. It is estimated that about 2 lac personnel are required to run the existing computerisation most effectively.

FINANCIAL STRUCTURE

As regards the size and growth of companies, the study found that most of the companies taken in the sample have grown in size in terms of capital employed (total net assets) over the years. The analysis showed that borrowed funds constitute a lion's share i.e. 84 percent of capital employed in telecommunication sector and 80 percent of capital employed in computer sector. The uses of borrowed funds increased at a very high growth rate i.e. 8 percent and 6 percent annually in telecommunication and computer sector respectively, over the years.

It is observed that the sample companies engaged in telecommunication and computer sector belongs to hi-tech area; and requires huge amount of investment. To cope up with the funds requirements as well as to achieve the higher rate of return on equity by repaying the dues whenever possible, companies are more and more relying on borrowed funds, which seems to be the characteristic of both sectors in India.

As import content in final marketable product of telecommunication is very high, companies engaged in telecommunication sector are maintaining inventory at a high level i.e. 47 per cent of current assets, as compared to companies engaged in computer sector i.e. 36 per cent of current
assets in 1989-90. For funding the inventory, companies use
borrowed funds which costs them more by way of interest. This has
resulted in to high finance costs (financial charges and
interest) for telecommunication sector.

PROFITABILITY

Profitability analysis indicated that total income of the sample
companies recorded an impressive annual growth i.e. 84 percent in
telecommunication sector and 39 per cent in computer sector over
the years. The total income would consist of sale of product(s),
maintenance charges, software developments, installation and
commissioning of product(s) at customer’s premises, sale of
spares etc.

Average total income of the sample companies of telecommunication
sector improved at a high growth rate i.e. 247 per cent over the
years i.e. 1987-88 to 1990-91. Average profitability of
telecommunication companies increased by 151 per cent over the
years. The percentage of decreases in materials costs ratio, and
administrative and selling expenses has caused the increase in
profitability. The analysis highlighted that generally in most of
the cases small group companies in terms of paid up capital have
achieved higher profitability as compared to other group of
companies.

Average total income of the sample companies of computer sector
was improved at a moderate growth rate of 19 per cent over the
years i.e. 1986-87 to 1989-90. Average profitability of computer
companies decreased by 40 per cent over the years. The business
activity surged forward during 1986-87 and 1987-88; and in 1989-
90 it showed a progress in a sharp contrast to subdued
performance noticed in 1988-89. The sample companies in computer industry tried to consolidate their position in 1989 and 1990. The industry experienced cut-throat competition in 1988-89. This competition has led for crash of income during this period. The percentage of increases in materials costs ratio, direct manufacturing expenses, and administrative and selling expenses has caused for the decline in profitability. The analysis highlighted that generally in most of the cases big group companies in terms of total income have registered stabilised profitability as compared to other group of companies, because economies of scale operate in the sector.

An analysis of profitability (ROCE, NP and RONW) and size of companies (in terms of SC, NW, CE and TI) gives interesting insights that in most of the cases in telecommunication sector, a negative relationship exists between profitability and size of companies in terms of share capital (paid up capital). However, also found that a positive relationship exists between profitability and size of companies in terms of total income. There was hardly any relation between profitability (ROCE, NP and RONW) and size of companies in terms of capital employed.

An analysis of profitability (ROCE, NP and RONW) and size of companies (in terms of SC, NW, CE and TI) gives interesting insights that generally in most of the cases in computer sector there existed an inverse relationships between profitability and market situation (i.e. boom or recession in market). If competition increases or recession in market, profitability decreases. Specifically, a positive relationship exists between profitability and size of companies in terms of total income.
MANUFACTURING PROCESSES

The suitable costing methods and procedures, for calculation of cost of the company and product(s), can be devised and installed only after critical and thorough understanding of the product(s) and the manufacturing processes. Inshort, to devise and install the suitable costing method for a company, a need arises to study the technical aspects, manufacturing processes etc. of a company and product(s).

Manufacturing processes for electronic telecommunication and computer equipments, basically involves assembly of various types of purchased components and parts, making sub-assemblies, testing them and assembling of equipment, the development of utility and application programmes and 'building' such programmes into the equipment, and finally testing them to cater the requirement of customers.

Manufacturing processes for the manufacture or assembly of telecommunication and/or computer equipments consists of number of operations i.e. incoming inspection (inspection of materials received from supplier), PCB baking, PCB masking, components forming, package (PCB) assembly, package inspection, soldering, lead cutting, back package washing, package testing, mechanical assembly, wiring, integration, configuration testing, equipment testing and packing.

The correct estimation and recording of time are very essential for correctly pricing and costing respectively. For this purpose, a group of time and motion engineers is formed in a unit, which is known as "Technical Efficiency Organisation".

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The various types of raw material items and components are used in the manufacture of products i.e. printed circuit boards, power supplies, active devices e.g. transistors, integrated circuits, oscillators, LCD etc., and passive devices e.g. diodes, regulators, resistors, capacitors, transformers, coils, cables and cable assemblies, varistors, fuse, circuit breaker, delay line, heat sink, switches, relays etc..

COSTING AND PRICING

The analysis of costs components (MCR, WSR, DMR, ASR and FR) and size of companies (SC, NW, CE, TI, inventory and debtors) highlighted that number of factors are affecting the behaviour of costs or affecting the cost ratios (cost as a percentage of total income).

The telecommunication and computer sector belongs to hi-tech industry and requires huge amount of investments. The study reveals that the technical know-how and technology for the products of the referred sectors are mostly imported one.

The policies of the countries from where technical know-how is imported, the quality assurance requirements of technology transferor, the quality i.e. speed, accuracy etc. of the installed plant and machineries, the requirement and need for preventive maintenance of plants and machineries, changes in structure of indirect taxes i.e. customs duty, excise duty, sales tax, local taxes etc., changes in the economic policies of the government, i.e. bank rates, credit policy, devaluation of currency, exchange rate variations etc., changes in industrial promotion policies by the government, i.e. introduction or abolition of subsidy etc., market sensitivity and situation,
pattern of use of types of funds i.e. owned capital or borrowed funds, pattern of deployment of available funds etc. also affect the costs of the company and product.

It can be concluded that number of factors affect the particular cost components i.e.

i. Inventory and level of activities, i.e. total income affects the materials costs;

ii. Level of activities i.e. total income affects the wages and salaries costs;

iii. Share capital, capital employed and total income affect the direct manufacturing expenses;

iv. Share capital, capital employed, total income and inventory affect the administration and selling expenses; and

v. Inventory, total income and debtors affect the finance costs.

The study reveals that the sample companies have installed well defined cost accounting system. The system adopted by them are more or less on the same line. As both sectors belong to hi-tech technology; the companies engaged in both sectors have computerised their cost accounting system.

The system is devised in such a manner that costs or expenses are routinely traced to a cost centre, the smallest segment of an activity or an area of responsibility for which costs are incurred. The costs or expenses are categorised into different types or groups, to control and monitor the each element of cost. For ascertaining costs of the company and product(s), the procedural aspects and methods followed are well
defined. To control and monitor the performance of company, department(s), and product(s), the sample companies use standard or estimated costs for the future period.

Based on practical costing system and empirical data, costs for the company and also for finished product(s) have been calculated and depicted in this research study. Three models from each sector have been selected and costs (both standard and actual) have been calculated. The variance (difference between standard and actual costs) study is also undertaken in brief.

The sample companies set their prices for the equipments by adopting mixture of full costs method and standard or estimated costs method. In practice, one dominating company sets a price based on estimated costs, which is followed by other companies in the referred sector(s). The customer is fully aware of the competing products, and their terms of sale agreement. The customer's decision is influenced by a number of factors e.g., speed, memory capacity, compatibility, reliability of the equipment, after sales services, and advertising and packaging of the product. At the time of deciding the prices for the product(s), company's management consider the status and position of national economy, industrial environment, competitor's strengths and weaknesses, company's share in market etc.. In practice, companies have three prices for a product i.e. list price, below list price and strategic price. Different prices are used for marketing and competitive reasons. The managements of the companies put a lot of stress on overall cost control and product costing. They use costing system as a yardstick to take managerial decisions. Once the prices have been decided, management regularly reevaluates the prices of the
To stand in quality conscious and competitive market at global level, a company will have to bid at competitive price with quality assurance. To gain control over these factors, the sample companies have installed well defined cost control systems. The companies engaged in referred sectors do not have separate systems for cost planning, cost reduction and cost control. The same system is used for all purposes.

The cost control system includes internal control systems and comprises of the following aspects:

1. Corporate objectives
2. Organisation charts and manuals
3. Setting of cost centres
4. Inter departmental documentation
5. Materials indenting and purchase system
6. Materials accounting system
7. Labour accounting system

The adherence to the internal control procedures or systems are helping the organisation to reduce as well as to control the costs of the company and of the product(s). The costing is playing a pivotal role for survival and growth of the companies. The regular compilation and monitoring of costs of the company as a whole and of the product(s) is very important. The mistakes in costs calculation and/or estimation will result into loss to the company i.e. if costs is wrongly estimated on higher side, company will lose business or if costs is wrongly estimated on lower side, company will land up with loss.
AREAS FOR FURTHER RESEARCH

Our study was a first attempt to analyse and study the "Costing system for the Electronic Industries - Telecommunication and Computers". It has revealed a number of issues in the area of costing and pricing. It is not within the scope of our study to see export costing and to study and evaluate the costs variance analysis system. Future research could be conducted in these areas. Further, more attempt could be made in future to relate the financing pattern to the deployment of funds in an optimal way.