LEVEL OF COMPETITIVENESS:

A CASE IN TURKISH TEXTILE INDUSTRY

by

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B.S. in I.E. Boğaziçi University, 1980

Submitted to the Faculty of the School of Engineering

in Partial Fulfillment

of the Requirements for the Degree of

Master of Science

in

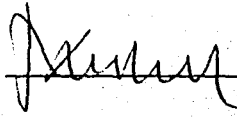Industrial Engineering

BOĞAZİÇİ UNIVERSITY

1982

We hereby recommend that the thesis entitled "Level of Competitiveness: A Case in Turkish Textile Industry" submitted by Ayfer Akhan be accepted in partial fulfillment of the requirements for the Degree of Master of Science in Industrial Engineering, School of Engineering, Boğaziçi University.
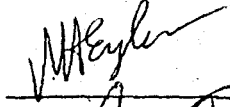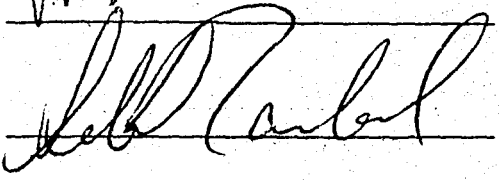
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ACKNOWLEDGEMENTS

ABSTRACT

This study investigates the nature and degree of competitiveness in Turkish Textile Industry.

An industrial survey has been conducted among twelve firms employing a questionnaire due to Oral. Based on the results of the survey, a mathematical model developed by Oral has been implemented to evaluate the level of competitiveness in the Industry. The model investigates the qualitative and quantitative variables which influence level of competitiveness, groups them, defines these groups as factors, studies the interaction of the factors and formulates level of competitiveness as a function of the relevant factors.

Level of competitiveness is then computed under different scenarios and influence of basic factors on level of competitiveness is investigated through a parametric analysis.

Consequently, goals for long term planning, which may be of help to improve level of competitiveness on sectorial basis have been defined.

ÖZET

Bu çalışmanın amacı, Türk Tekstil Endüstrisinin yapısını iç ve dış pazarlardaki rekabet gücü açısından araştırmak ve değerlendirmektir.

Oral tarafından düzenlenen bir bilgi formu kullanılarak oniki firmada inceleme yapılmış ve toplanan bilgi ve verileri kullanarak yine Oral tarafından geliştirilen matematiksel bir model uygulanmıştır. Bu model, rekabet gücünü etkileyen nicel ve nitel değişkenleri araştırarak onları faktörler şeklinde gruplandırmakta ve faktörler arasındaki etkileşimi inceleyip rekabet gücünü bağlı olduğu faktörlerin bir işlevi olarak formülleştirmektedir.

Rekabet gücü, düzenlenen değişik senaryolara göre hesaplanmış ve önemli faktörlerin rekabet gücü üzerindeki etkisi parametrik analiz yolu ile araştırılmıştır.

Çalışma, yapılan araştırmaya bağlı olarak sektör düzeyinde rekabet gücünü iyileştirmekte katkısı olabilecek uzun vadeli hedeflerin tanımı ile sonuçlandırılmıştır.

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I. INTRODUCTION

I.1. Problem Definition

The purpose of this study is to analyse the structure of the firms in Turkish Textile Industry with respect to competition in local and foreign markets and evaluate the level of competitiveness in Turkish Textile Industry. The study further investigates the objectives for long term planning, which can purpose remedial measures that may be of help to improve the 'level of competitiveness' on sectorial basis.

I.2. Relevance of the Problem

Foreign trade deficit encountered every year, increasing cost of raw materials, approaching date of full membership to EEC and the problems faced in the economical and political relations with foreign countries and international organizations emphasize the importance of level of competitiveness for Turkish firms. Sharp increases in import prices, stagnated production and reliance on short term financing have made Turkish economy particularly vulnerable to international competition. Consequently, "degree of success" has become equivalent to "level

of competitiveness" in local and foreign markets' [18]. There-
fore, awareness of level of competitiveness will enable a firm
to successfully capitalize on her unique strengths and catch
competitiors of guard, thus staking out a position that is less
vulnerable to attack.

Textile Industry is chosen in particular for this study as
a way to demonstrate the procedure because of its major import-
ance in Turkish Industry and Exports. The industrial development
of the countries which are now highly industrialized owed much
to the vigorous expansion of their textile manufacturing indust-
ries. In the developing countries, the textile industries was
one of the first industries to be established. For these count-
ries the textile sector is important both for its high employment
potential and for the value added to the manufacturing sector [28].
Table I.1. presents the Employment in some manufacturing sectors
of Turkish Industry among which Textile is remarkable. It is
therefore important for all developing countries as well as
Turkey to ensure the efficient and economic operation of textile
industry. Allowing the existence of a dynamic export industry
it is already an indispensable part of Turkish manufacturing
industry as presented in Table I.2.

Special emphasis has been placed on selection of objectives
for long term planning for proper selection of goals is of utmost
importance during any decision making and planning processes.

Table I.1. Employment in Some Manufacturing Sectors of Turkish Industry

Manufacturing Sector	Number of Companies	Total Number of Workers	Number of Workers/Company
Chemistry	48	7164	149
Sugar	36	28119	781
Food	39	5464	140
Earthenware	36	4797	133
TEXTILE	80	48050	600
Cement	12	5620	468
Glass	10	6503	650
Paper	11	1632	148
Ship	4	674	168
Total	276	108024	391

Source: Turkish Employer's Union Confederation (1982).

Table I.2. Turkish Textile Exports

Year	Value of Exports (Million $)
1976	314.5
1977	315.0
1978	359.7
1979	442.7
1980	514.2
1981	1045.6 (1)

Source: TÜSİAD
(1) In 1981, total Turkish exports amounted to 4.7 billion dollars; share of textile exports in total exports was 22% and share of textile exports in exports of manufacturing industry was 59%.

.3. Approach to the Solution of the Problem

The level of competitiveness concept and the pertaining ethodology employed in this study have been originated and eveloped by Oral [18,19]. The methodology investigates the ualitative and quantitative variables which influence level of ompetitiveness, groups them, defines these groups (factors), tudies the interaction of the factors and formulates level of ompetitiveness as a function of the relevant factors. The qua- itative factors such as production superiority, level of tech- ology, level of management, level of labor, marketing skills olitico-economical environment, that do not have a standard efinition and whose measurement is still very vague, have been articularly taken into consideration.

An industrial survey was conducted in order to implement his methodology. Based on the results of the survey, level of ompetitiveness was computed under different scenarios and influ- ence of basic factors on level of competitiveness was investigated through a parametric analysis. Consequently, goals for long term lanning were defined. In view of this configuration, the study s necessarily concerned with inter-corporate forces, corporate ctivities te keep up-to-date on their competitors and corporate esponses to manifestations of politico-economical environment.

I.5. Results

It is concluded that level of competitiveness in Turkish Textile Industry with respect to foreign competition relies on her cost superiority, which is a consequence of low cotton and labor costs. Internal competition is, however, more fierce, since the firms cannot stake out a position due to a discriminating cost advantage.

Poor efficiency projects itself as the most important problem to be tackled with. Low integration, inappropriate technology in Weaving and Finishing Sector, small scale production in Clothing sector, lack of a well established ancillary industry, poor management skills and high interest rates are the main causes of poor efficiency. In view of this study, concerted action of Government and the corporate which is basically concerned with

    i) Choice and transfer of appropriate technology,

   ii) Completion of vertical integration,

 iii) Establishment of ancillary industry,

  iv) Better financing

is necessary to restructure and reorient the Industry so as to exploit "potential efficiency" as much as possible.

II.   TEXTILE TECHNOLOGY

II.1. Basic Manufacturing Processes

Many different machines are used in the transformation of natural or man-made fibres into cloth. No attempt is made here to provide a comprehensive description of the process, it is desirable, however, to indicate briefly the basic stages in textile production [7,21] and to relate them to recent developments in technology.

Spinning: The value and character of a yarn are determined by 1) kind and quality of fiber 2) amount of processing necessary to produce finenes and 3) amount of twist which increases tensile strength in the finished yarn. The purpose of the yarn must be anticipated, as this determines the number and the kind of manufacturing.

Natural fibers (principally cotton and wool) are washed, combed or carded and spun into a yarn. Man-made fibres cut to a suitable length are also processed on cotton or wool spinning equipment. Combing is only of major importance in the wool sector, where the intermediate product, tops, are used for pro-

ducing fine worsted yarns for high quality cloths.

1) Opening, blending and cleaning: When bales are opened at the mill, the compressed masses of raw fiber are loosened and exposed to the atmosphere. Variations in the raw material is eliminated by mixing together parts of several bales and feeding the material into the opening machines. This blending of the raw material results in greater uniformity. Hard lumps in the fibers are loosened and the impurities are removed by three machines known as pickers: breaker, intermediate and finisher. These machines clean and form the cotton laps or rolls.

2) Carding: In the lap stage, the fibers are still in a tangled condition and contain waste material. Before this raw stock can be made into yarn, these impurities must be removed and the fibers must be straightened. This initial process of arranging the fibers in a parallel fashion is known as carding. The work is done on a carding machine where the lap is unrolled and drawn on a revolving cylinder covered with very fine hooks or wire brushes. A moving belt, also covered with wire brushes is on top of this cylinder. The cylinder pulls the fibers in one direction, disentangles them and arranges them parallel in the form of a thin film. This film is drawn through a funnel-shaped device that molds it into a round ropelike mass called card sliver.

3) Doubling: After carding, several slivers are combined resulting in a relatively narrow lap of compactly placed staple

fibers. The compactness of these fibers permits this cotton stock to be drawn out.

4) Combing: When the fiber is intended for fine yarns, the sliver is put through an additional straightening called combing. In this operation, fine-toothed combs continue straigthening the fibers until they are arranged with such a high degree of parallelism that the short fibers, called noils, are combed out and completely separated from the longer fibers. (This procedure is not done when processing man-made staple fibers because they're cut into predetermined uniform lengths). The combing process forms a comb sliver made of the longest fibers, which, in turn, produces a smoother and more even yarn. This operation eliminates as much 25 percent of the original card sliver; thus almost one-fourth of the raw cotton becomes waste. The combing process is identified with consumers' goods of better quality since long-staple yarns produce stronger, smoother and more serviceable fabrics.

5) Drawing-out: The combining of several slivers for the drawing-out process eliminates irregularities that would otherwise cause too much variation. The drawing frame has several pairs of rollers, each advanced set of which revolves at a progressively faster speed. This action pulls the staple lengthwise over each other, thereby, producing longer and thinner slivers. After several stages of drawing out, the condensed sliver is taken to the slubber, where rollers similar to those in the

drawing frame draw out the cotton further. Here the slubbing is passed to the spindles where it is given its first twist and is then wound on bobbins.

6) Roving: These bobbins are placed on the roving frame, where further drawing out and twisting take place until the cotton stock is about the diameter of a pencil lead. There are two stages of roving, intermediate and fine. The operations are identical, but each machine yields a finer product than the stock it received. Roving is the final product of several drawing out operations. It is a preparatory stage for the final insertion of twist. To this point, only enough twist has been given to the stock to hold the fibers together. Roving has no tensile strength; it will break apart easily with any slightpull.

7) Spinning: The roving, on bobbins, is placed in the spinning frame, where it passes through several sets of rollers running at successively higher rates of speed and is finally drawn out to yarn of the size desired. Spinning machines are of two kinds: ring frame and mule frame. The ring frame is a faster process, but produces a relatively coarse yarn. For very fine yarns, the mule frame is required because of its slow intermittent operation. The ring frame, which is in general use now, is more suitable for the manufacture of cotton yarns for mass production. The ring spinning frame completes the manufacture of yarn 1) by drawing out the roving, 2) by inserting twist, and 3) by winding yarn on bobbins - all in one operation.

Products: Cotton, wool, acrylic, polyester/cotton, polyester/wool and polyester viscose yarns. In the wool system the yarn (or tops or fibre) are usually dyed. In the cotton system dyeing is carried out mainly at the fabric stage and the yarns are usually white. Some man-made fibres are produced in colored form as fibre.

The second stage of development of fiber into fabric is the weaving operation.

Weaving: In the weaving operation, the lengthwise yarns that form the basic structure of the fabric are called warp. The crosswise yarns are the filling (weft). The filling yarns undergo little strain in the weaving process. In preparing them for weaving, it is necessary only to spin them to the desired size and give them the amount of twist required for the type of fabric for which they will be used.

Basic pre-processes: Yarns intended for the warp must pass through such operations as spooling, warping and slashing to prepare them to withstand the strain of the weaving process.

i) Spooling (cone winding): This operation facilitates subsequent processing by rewinding yarn onto a large package and removing faults.

ii) Warping: The warping step assembles the warp threads in a form suitable for sizing and drawing into the loom.

iii) Slashing (sizing): The slasher machine covers every yarn with a starch coating to prevent breaking during weaving process.

The sized yarns are passed over large steam-heated copper cylinders that remove the moisture and set the size. They're then washed on a final warp beam and are ready for the loum.

iv) Pirning: It is the operation necessary only for shuttle looms. It winds yarn onto a package suitable for insertion in the shuttle of a loom.

Weaving: The warp threads are assembled and are then usually strengthened against in the loom by sizing. In the loom the warp threads are alternately raised and lowered and thought threads passed between them. Rolls of cloth are then transferred from the looms to the clothroom where the fabric is inspected and mended.

Products: Woven fabrics range from scarves to canvois including specialized fabrics for car tyres. Carpets are produced by a separate subsector employing similar basic techniques.

The main choice at the weaving stage is between shuttle looms and shuttleless looms. Shuttle looms range from hand looms thru non-automatic power looms, the progression being towards more automatic labor-saving and capital intensive machines.

Knitting: Knitting is the second most important fabric

oducing process after weaving. Knitted fabrics may be cons-

ucted with a single yarn that is formed into interlocking

ops by the use of hooked neddles. The loops may be either

osely or closely constructed according to the purpose of the

ibric. The interlocking loops of the knitted construction per-

.t the fabric to stretch in any direction even if low-grade

irn having little elasticity or yarn that lack natural elasti-

ity is used. Woven fabrics, on the other hand, are constructed

y the interlacing of two or more yarns, which don't allow the

abric to stretch to any marked degree.

Product: Socks, stockings, T-shirts, underwear.

Finishing Processes: Fabrics must pass through various

inishing processes that make it suitable for many different

urposes. Finishing enhances the appearance of the fabric and

ay add to its serviceability and durability.

Here, essential finishing processes will be described:

1) Singeing or gassing: If a fabric is to have a smooth

   finish, singeing is one of the first essential prepara-

   tory processes. This operation burns off tint and

   threads as well as all full and fiber ends leaving an

   even surface before the gray good (2) passes through

   other finishing processes or a printing operation.

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2) gray good denotes any unfinished fabric as it comes from the loom;
   textiles, on the other hand, denotes finished fabric.

2) Bleaching: If cloth is to be finished white or is to be given surface ornamentation, all natural color must bu removed by bleaching. This is also necessary if discoloration or stains have occured during the previous manufacturing process. The kind of chemicals to be used depends upon the kind of textile fiber of which the fabric is composed.

3) Mercerizing: This operation causes the flat, twisted, ribbon like cotton fiber to swell into around shape and to contract in length. The fiber becomes much more lustrous and its strength is increased. Its affinity for dyes is much greater. The process consists of passing the fabric through a cold 15_20% solution of caustic soda. It is then stretched on a tenter frame where hot-water sprays remove most of the caustic.

4) Shrinking: When fibers are spun into yarn, they are under constant tension during the weaving process. Their physical condition is changed, but not permanently fixed: the fibers tend to revert to their natural state, causing shrinkage. The yarns are made to assume a final condition by shrinking the fabric is a preparatory finishing process that minimizes subsequent shrinkage, such as chemical treatment. But even when textile fabrics are preshrunk, they are liable to further shrinkage when washed.

5) Tentering: This operation is applied at various stages
   of finishing. Usually, the fabric is wet when it is
   run into a tenter; drying and evening of the fabric
   with a distance between them that can be adjusted. The
   chains are equipped with clips or pins, which grip the
   selvage of the fabric and carry it into the heated
   housing where a blast of hot air removes any moisture.
   It is a continuous operation in that the goods enter
   one end of the frame and emerge from the other.

6) Stiffening: Cotton and linen are given stiffness,
   smoothness, weight and strength by immersion in a
   solution of a starch.

7) Calendering: It adds sheen to the fabric. The method
   varies according to the type of finish desired. Calen-
   ders are heavy machines made up of at least two rolls.
   The rolls are supported in vertical frames. In opera-
   tion, the goods pass rapidly between the nips framed by
   the rolls.

8) Glazing: A glazed surface can be obtained by the appli-
   cation of starch, glue, shellac followed by calendering.
   This process makes a fabric resistant to dust and mini-
   mizes shrinkage.

9) Shearing: It gives an attractive smooth surface to
   the cloth. Shearing levels all surface irregularities.

It is done by a cylindirical machine having rotating spiral blades whose action resembles that of a lawn mower. After shearing the fabric is automatically brushed to remove the sheared ends of the yarns.

10) Dyeing: In this process, fiber, yarn or fabric is immersed in a solution of dyestuff and is thus saturated with dye.

To select the proper dye, it is necessary to know which dyes have an affinity for the vegetable, animal or man-made fibers.

11) Printing: There are various printing methods such as block printing, roller printing, duplex printing etc. In must of these methods, the dye is imprinted on the fabric in paste form and any desired pattern may be produced. The dyes are dissolved in a limited amount of water to which a thickening agent has been added to give the necessary viscosity to the print paste.

Dyeing and printing differ in the method by which color is applied to fabric. In the dyeing process, fiber, yarn or fabric is immersed in a solution of dyestuff and is thus saturated with dye. In printing, a pattern or design is imprinted on the fabric in one or more colors by using dyes in paste furm. At the end of finishing processes, there's no product strictly speaking, merely an added value, which may, however, be very considerable.

Clothing: The fourth stage involves clothing. The clothing industry takes woven or knitted cloth, cuts it and sews together the pieces to make garments. In essence, it remains an artisan operation and although in large plants hundreds of people (mainly women) work side by side, it is not a typical industrial operation. It is still essentially a woman with a sewing machine, even if the total operation is broken down into small repetitive components.

Product: The products cover all types of clothing from casual weak to haute couture.

Fig II.1. Presents basic manufacturing processes of a cotton textiles.

II.2. Recent Technological Changes

Traditionally textile manufacture has been a labor-intensive industry. The rising cost up labor in the developed countries was a strong incentive to produce machinery operating at higher speed or combining a number of processes and to introduce the automated handling of materials between processes. As a result, textile manufacture can now be a highly capital-intensive industry, where a high rate of utilization of machinery must be continuously achieved in order to make profits.

This does not mean that the developing countries have to adopt the most modern and sophisticated technology. On the con-

:ary, it means that they have a wide range of machinery than in
)erhaps any other industry to suit the particular ratio of capi-
:al to labor cost.

Proper machinery selection is one of the key problems in
:he development of the textile industry. The machinery must
suit the twofold requirements of developing countries: while
it should be adequate for competitive production, it should not
reduce labor input at the expense of higher capital input. From
among the modern technological alternatives a level should be
selected that strikes a balance between fixed costs based on
depreciation and variable costs based essentially on wages [27].

There are basically three types of looms regarding weaving
process:

    i) The shuttle loom, which carries its own yarn supply
       by the shuttle,

   ii) Shuttleless loom (Projectile loom), which carries the
       yarn supply by a metal projectile [260 cyc/min] .

  iii) Air [450cyc/min] and water-jet looms where weft yarn
       is transmitted accross the weaving shed by air or water
       pulsed from a nozzle [8] .

Air and water-jet looms reach revolutionizing speeds but
natural fibres are ill- adapted to the tensile requirement of
high speeds [26] . They are highly capital intensive as shown
in Table II.1.
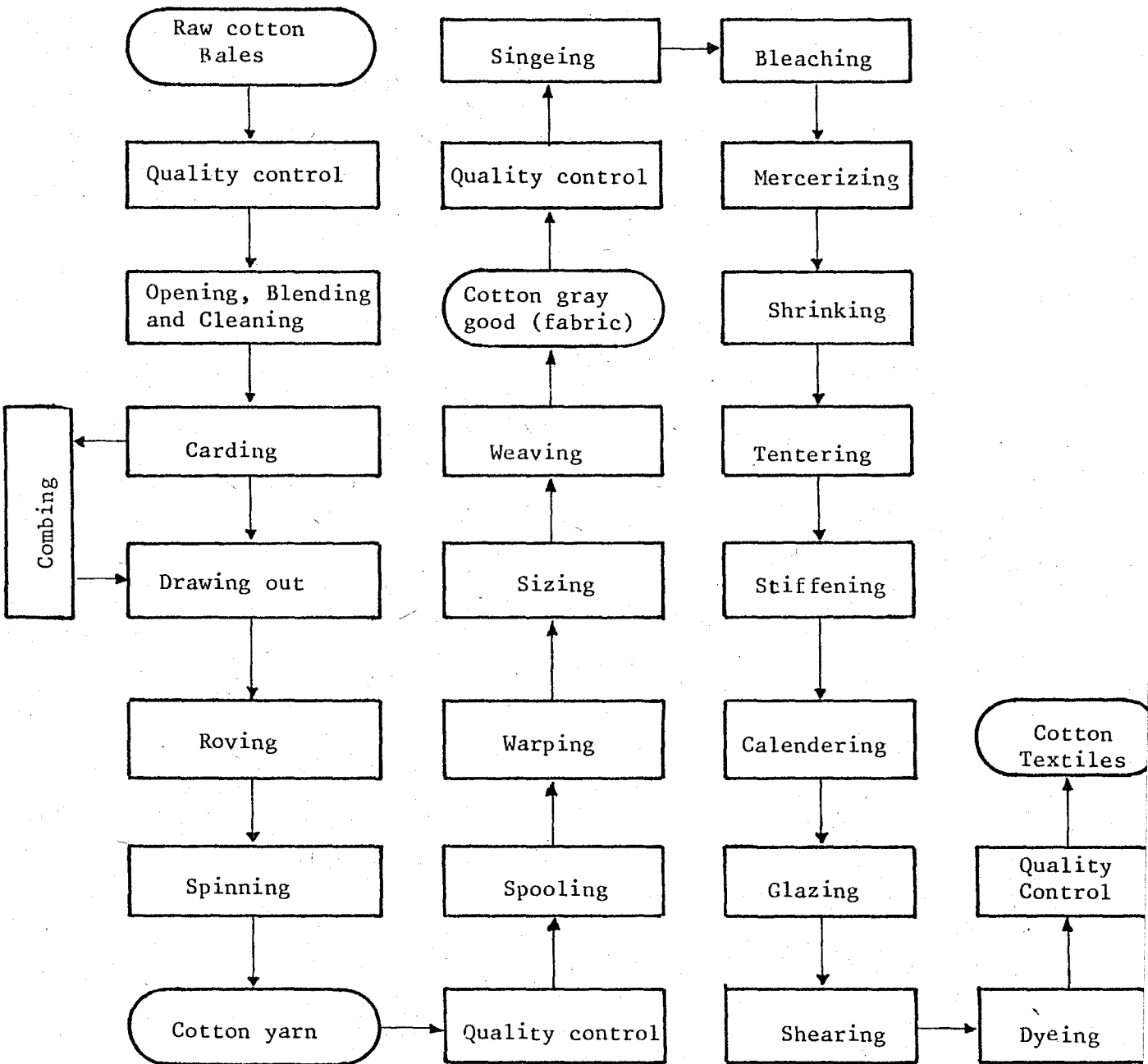
Fig II.1. Basic Manufacturing Processes of an Ordinary Cotton Textiles.

Fig II.2. presents a weaving cost comparison between three types of looms. Fig II.3. and Fig II.4., on the other hand depict the labor requirement and productivity of different looms.

While the core of a given technology might be the machinery, its efficient utilization involves several other factors, of which technical skill, organizational and managerial support, infrastructural facilities for transport, communication and storage and the availability of appropriate raw materials are the most important.

Table II.1. Amount of Investment Required to Establish a Plant in Certain Manufacturing Sectors in West Germany.

Sector	Amount of Investment (D.M.)
Refinery	1.550.000
Paper	600.000
Metal	360.000
TEXTILE	250.000
Food	240.000
Railroad Vehicles	190.000
Glass	160.000
Plastics	130.000
Electrotechnics	110.000
Machinery	100.000
Optics	60.000
Watch	60.000
Shoe	30.000

Source: 'Dünya Tekstil Endüstrisine Genel Bakış', Doç.Dr.Işık Tarakçıoğlu, Ege University, 1982.

%

140

120

100

80

60

40

20

0

139.5

100

121.9

Air Jet

Conventional
Shuttle Loom

Projectile
(Shuttleless Loom)

| | Capital
| | Personnel
| | Building
| | Electricity
| | Spare parts
| | Yarn loss
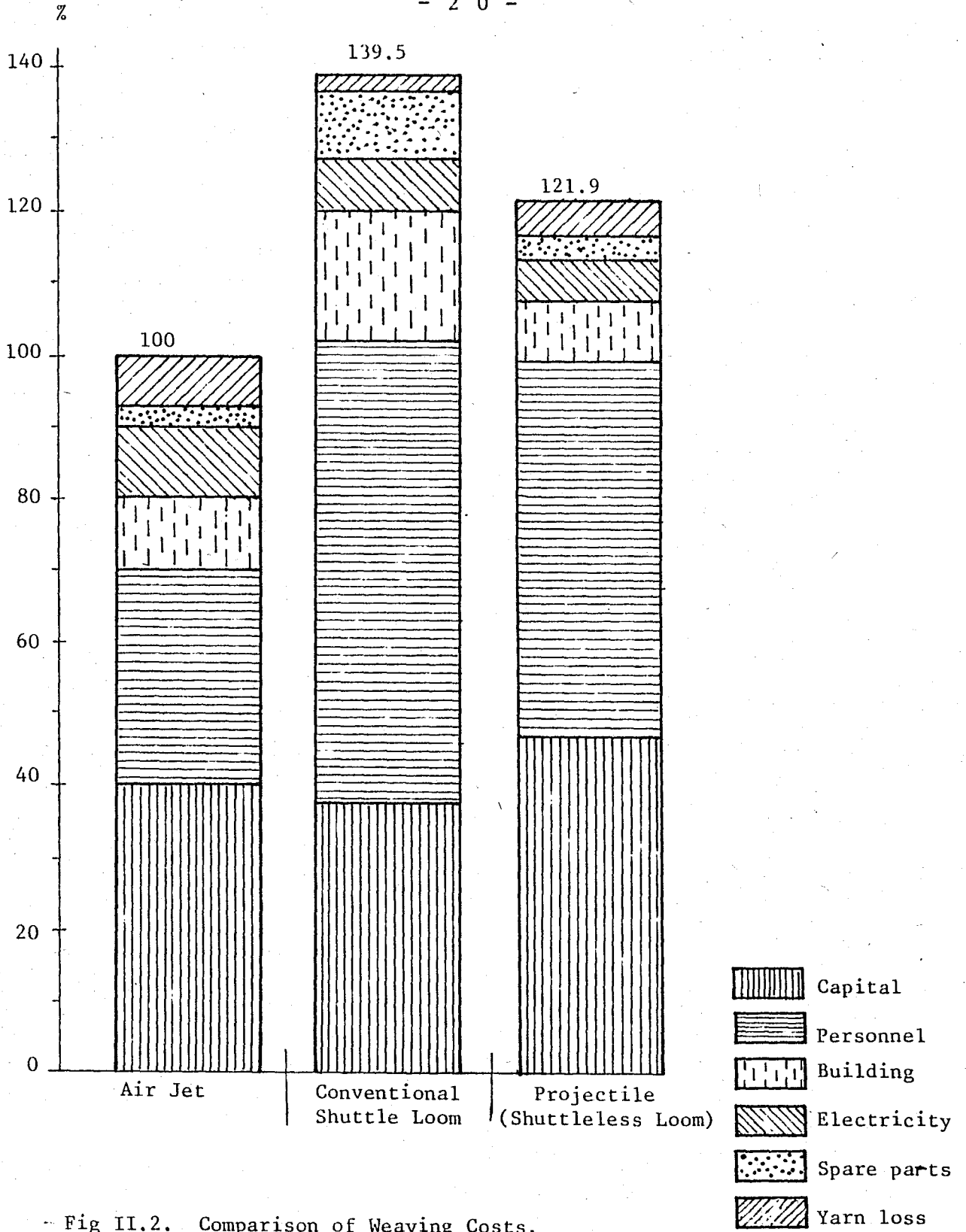
- Fig II.2.   Comparison of Weaving Costs.
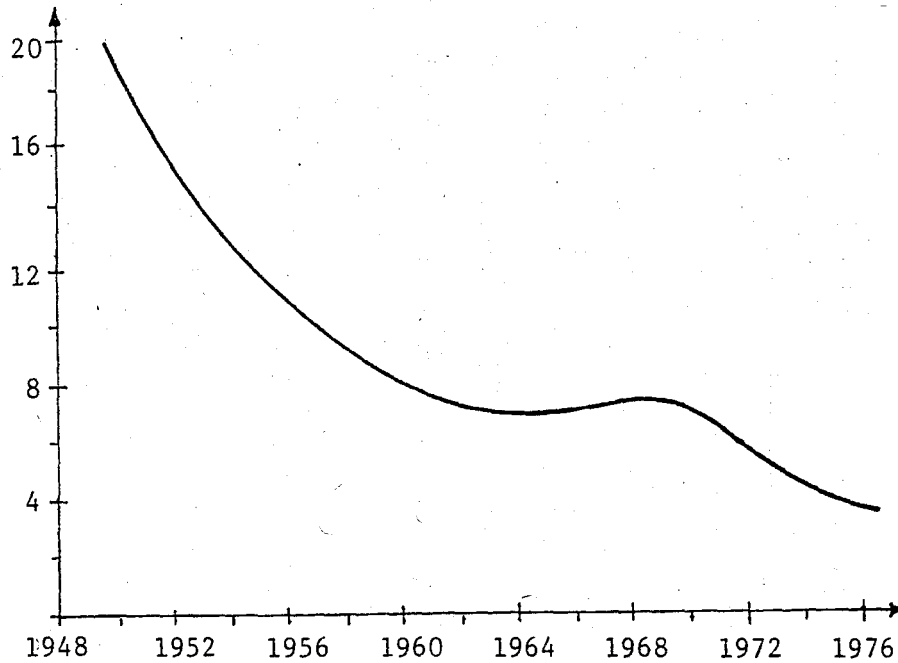
Fig II.3. Labor minutes per kg of yarn
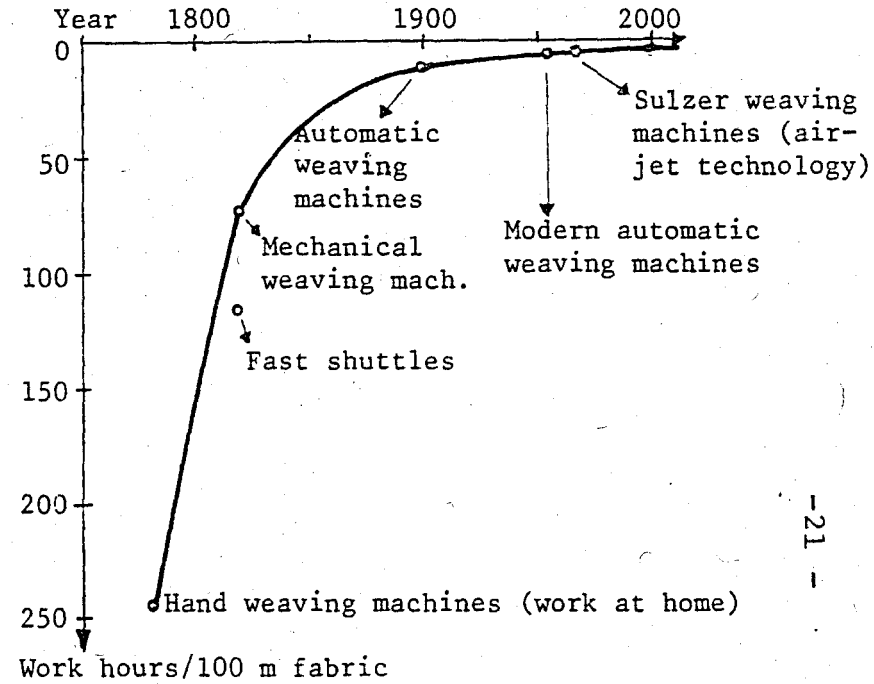
Fig II.4. Productivity rise

Source: 'Fibres and Textiles: Dimensions of Corporate Marketing Structure,' Study by the UNCTAD Secretariat,
         UNITED NATIONS, 1981.

III.   INDUSTRIAL SURVEY

III.1.   Firms Selected for the Survey

Twelve firms from Turkish Textile Industry were selected for this study.   Table III.1. shows some of the main characteristics of these firms.

Almost equal number of firms were selected from yarn, textiles and clothing subsectors.   Total number of workers employed is 12.53% of the total number of total exports in Turkish Textile Exports is 8.44%.

Twelve firms is only one-eighth of the total number of firms in Turkish Textile Industry, therefore, they don't reflect the whole picture.   This study is, however, primarily concerned with implementing a methodology due to Oral [19].

III.2. The Nature of the Interview

Twelve firms were visited in order to observe and study the structure of the firms.   Interviews were made with senior executives, technical director, director of production control, director

Table III.1. Main Characteristics of the Firms Selected

Firm	Location	Beginning of Production	Field of Operation	Products	Number of workers employed (direct-labor)	Exports($) (1981)
1	Istanbul	1952	Textiles and clothing	Woolen and synthetic apparel textiles, clothing	2320	13.484.000
2	Izmir	1974	Clothing	Cotton combing and knit clothing and lingerie	270	5.100.000
3	Manisa	1978	Clothing	Clothing	420	791.348
4	Istanbul	1958	Integrated	Apparel textiles and clothing	1200	11.703.000
5	Tarsus	1924	Integrated	Yarns; apparel textiles; clothing	3300	26.700.000
6	Istanbul	1978	Yarns and Textiles	Woolen and synthetic yarns and textiles	750	1.171.000
7	Istanbul	1972	Clothing	Clothing	1011	3.402.000
8	Adana	1972	Integrated	Yarns; apparel and non-apparel textiles (including velvet)	1808	6.644.000
9	Istanbul	1956	Yarns and Textiles	Cotton and synthetic yarns and textiles	1100	1.055.100
10	Istanbul	1974	Yarns	Cotton combing, carding and synthetic yarns	620	9.302.700
11	Istanbul	1957	Textiles	Cotton apparel and non-apparel textiles	750	2.423.300
12	Istanbul	1970	Clothing	Cotton combing and knit clothing and lingerie	320	6.424.910
Total					13.869	88.201.703

of marketing, director of exports, R and D and process director, financial manager, personnel manager, sales manager, director of accounting, director of education, director of quality control and directors of physics and chemistry laboratories in each firm depending on the degree of labor division.

A questionnaire [19], which is presented in Appendix I was used to systematically collect data.

III.2.   The Questionnaire

The questionnaire is primarily concerned with the major aspects of top level management, middle management, production, technology, R and D, quality control, labor, marketing, sales and exports.   The purpose of the questionnaire is to collect data as well as to analyse the factors influencing competitive potential so as to find out their configuration.

Part I is concerned with the general information about the firm.   Part II investigates sales forecasting, product mix, unit manufacturing costs, production scheduling, inventory control, quality control, repair and maintenance, accounting system, direct labor, productivity, educational programs and characteristics of management.   Major concern of Part III is technology capacity and R and D: characteristics of machine and equipment, production technology, technological performance of different countries, capacity utilization under different constraints, characteristics of R and D department are inquired.   Part IV

is concerned with marketing, competitors and sales. It deals
with the performance of the firms in local and foreign markets,
sales and exports she has realized and bureaucratic difficulties
encountered by her in exports.

IV. COMPETITIVENESS MODEL

IV.1. Approach to 'Industrial Competitiveness' Concept

This section will briefly describe the concepts, methodology and formulae developed by Oral [19].

There are hundreds of variables which influence the level of competitiveness of a firm. It is very hard to examine them simultaneously in order to conceptualize their interaction in the framework of competitiveness. Therefore, they are first grouped and then the interaction among the group variables has been investigated.

According to the first model developed level of competitiveness is defined as a function of

   i) Production superiority

  ii) Marketing skills

 iii) Financial power

  iv) Intrastructure

Production superiority, which is defined as a function of unit manufacturing cost, quality, delivery time and amount, is

one of the most important factors that influences level of compe-
titiveness. Firm's level of competitiveness increases when pro-
duction scale increases, unit manufacturing cost decreases,
quality improves and delivery time shortens. Economics of scale
is a crucial factor in competition; low unit manufacturing cost
and high capacity is necessary for competition but it's not suffi-
cient: Foreign firms, in particular, do not attempt to negotiate
for price if the products do not have the desirable quality.
Among all other variables, it is the most important one, which
influences level of competitiveness in foreign markets (see
question IV.4 in the questionnaire in Appendix I). In addition,
short delivery time is sought for by many customers.

Production superiority must be coupled with effective
marketing and distribution to exploit the market, otherwise
the firm will be doomed to compete in her individual niche.

The firm may have to sell on credits to keep or expand
her market segment. Then, she has to be financially powerful
in order to overcome the problems, which originate from stagnated
cash flow; otherwise she can't sell on credits and will lose her
market share. Similarly, the payments she expects from her fore-
ign customers may be delayed due to several external and internal
reasons. In these circumstances, she can survive only if she
has financial power.

Production superiority, marketing skills and financial
power are firm oriented factors, but there are several external

factors which influence the firm. They are grouped as "politico-economical environment", which influences the level of competitiveness in four ways:

  i)   Infrastructure
 ii)   Cost of Inputs
iii)   Monetary and fiscal measures
 iv)   Political and economical relations with foreign countries

Infrastructural problems related to energy, communication, bureaucracy influence many firms adversely and even result in the loss of important opportunities. A well-established infrastructure is an indispensable part of competitive strength.

Cost of basic production inputs such as raw material, labor and energy influence first production superiority then level of competitiveness to a great extent. The Government directly affects the cost of basic production inputs by dictating the minimum and maximum prices. As a consequence of her politico-economical conditions and natural resources Turkey is advantageous in costs of cotton and labor but disadvantageous in costs of wool and synthetic fibers.

Monetary/fiscal policy of the Government influence level of competitiveness in many ways. Decisions related to tax rebate, credits, interest rates and cash supply directly affect level of competitiveness by increasing/decreasing the unit manufacturing costs.

Good political and economical relations must be employed to improve the local and foreign market conditions. For instance, bilateral agreements made with Middle Eastern countries recently have eliminated our foreign competitors and created important opportunities for Turkish firms.

Production superiority which is defined as a function of unit manufacturing cost, quality, amount and delivery time is a consequence of level of management, level of technology, utilized capacity and level of labor. As utilized capacity increases unit manufacturing cost will decrease; as level of management, level of technology and level of labor improve quality will increase and delivery time will decrease. Level of technology is defined as a function of R and D, capacity and level of labor.

R and D is necessary for the choice of appropriate technology and technology transfer as well as improvement of the existing level of technology. Technology is a "man-machine system", i.e. technology owes much to the level of labor, defined as the knowledge and experience of engineer, foreman and worker, who uses the machinery and equipment. As capacity scale increases level of technology changes and choice of appropriate capacity and technology depend on R and D.

These are the basic features of Model I. The contact with the industry and collected data, however, have changed Model I as in Fig. IV.1. Level of competitiveness has been defined under the same variables, but the groupings are different.

Level of competitiveness has been defined as a function of general efficiency and cost superiority. General efficiency is a measure of the utilization of the "man-machine system". Cost superiority, on the other hand, shows the advantage of the firm with respect to her competitor in terms of costs of basic production inputs.

The factors remaining inside the dotted region are very hard to quantify. In order to develop a mathematical model, these factors have not been explicitly taken into consideration.

In the sequel, definition and notation of the factors employed in Model 2 will be presented.

IV.1.1. Definition and Notation

Ideal Capacity

It is the maximum capacity that a firm can create under ideal conditions, that is

i) physical production facilities are in a perfect condition, age of machinery and equipment is zero and they perform their function fully without any breakdowns.

ii) workers are all qualified and run the machinery and equipment with full productivity.

iii) the senior executives and the middle management utilize this system in an optimum manner taking the right strategic decisions.
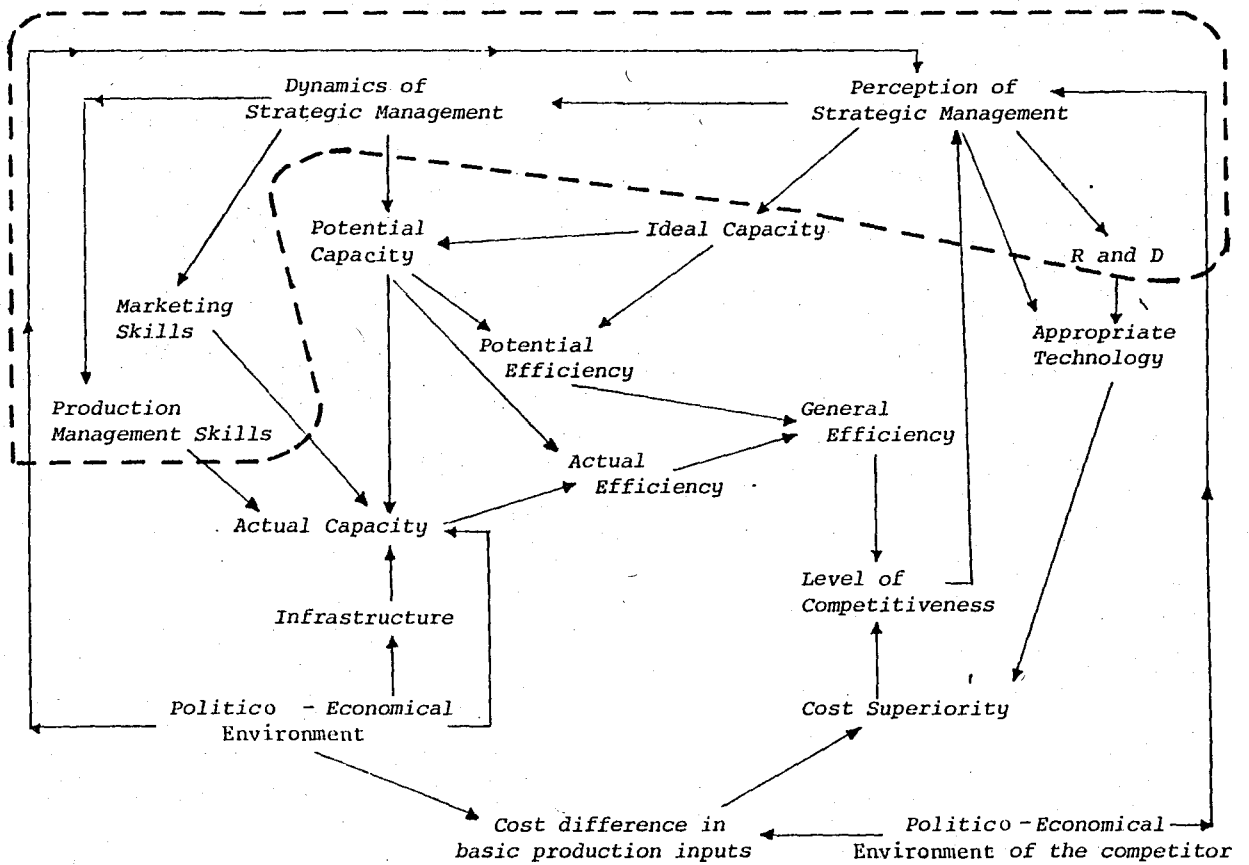
Fig. *IV.1.* Level of Competitiveness and its interaction
with the other factors

iv) There are no infrastructural problems such as elect-
ricity cuts, lack of well established transportation and commu-
nication systems and so forth.

Briefly speaking there are no internal or external prob-
lems faced by the firm and everything is perfect. Then ideal
capacity is defined as follows:

$$\text{Max } C_1 = \sum_{j=1}^{n_1} fj(xj)$$

$$\underline{A}_I \underline{x} \leq \underline{k}^I \qquad\qquad (IV.1)$$

$$\underline{x} \geq \underline{0}$$

where $\underline{A}_I = \| a_{ij}^I \|$ 　　　 or

$$\underline{A}_I = \begin{pmatrix} a_{11}^I & a_{12}^I & \cdots & a_{1j}^I & \cdots & a_{1n_1}^I \\ a_{21}^I & a_{22}^I & \cdots & a_{2j}^I & \cdots & a_{2n_1}^I \\ \vdots & & & & & \\ a_{m_1 1}^I & a_{m_1 2}^I & \cdots & \cdots & \cdots & a_{m_1 n_1}^I \end{pmatrix}$$

$$\underline{k}^I = [k_1^I, \ k_2^I, \ \ldots, \ k_{m_1}^I]$$

$$\underline{x} = [x_1, \ x_2, \ \ldots, \ x_{n_1}]$$

$$\underline{0} = [0, 0, \ \ldots, \ 0]$$

$a_{ij}^I \equiv$ amount of resource i consumed by one unit of product
   j under ideal conditions

$$i = 1, \ \ldots, \ m_1$$

$$j = 1, \ \ldots, \ n_1$$

$x_j \equiv$ Amount of product; to be produced under ideal conditions,

$k_i^I \equiv$ Amount of resource, available under ideal conditions.

$f_j(x_j) \equiv$ Utility function of producing x_j units of product;

Firms cannot realize the ideal capacity, because the machinery and equipment is not always zero years old, workers may not be qualified enough, the management may under utilize the production facilities. The interaction of these factors will decrease the ideal capacity resulting in potential capacity.

Potential (Feasible) Capacity: It's the capacity that can be created under the existing conditions of machinery and equipment, labor and management. In other words, it's the capacity that can be realized with the existing man-machine system, but the firm is not being exposed to any external problems such as electricity cuts, low demand, bureaucratic difficulties.

Then potential capacity is defined as:

$$\text{Max } C_2 = \sum_{j=1}^{n_2} g_j(y_j)$$

$$\underline{A}_p \ \underline{y} \leq \underline{k}^P \qquad\qquad\qquad (IV.2)$$

$$\underline{y} \geq \underline{0}$$

where

$$\underline{A}_p = \left\| a^p_{ij} \right\| \ , \ \text{or}$$

$$\underline{A}_p = \begin{pmatrix} a^p_{11} & a^p_{12} \cdots & a^p_{1n_2} \\ a^p_{21} & a^p_{22} \cdots & a^p_{2n_2} \\ \cdot & & \\ \cdot & & \\ \cdot & & \\ a^p_{m_2 1} & a^p_{m_2 2} \cdots & a^p_{m_2 n_2} \end{pmatrix}$$

$$\underline{k}^p = [k^p_1, \ k^p_2 \ \cdots \ , \ k^p_{m_2}]$$

$$\underline{Y} = [Y_1, \ Y_2 \ \cdots \ , \ Y_{n_2}]$$

$$\underline{0} = [0, \ \cdots \cdots , 0]$$

$a^p_{ij} \equiv$ amount of resource i consumed by one unit

      of product j under feasible conditions

$i = 1, \ldots, m_2$

   $= 1, \ldots, n_2$

$y_j \equiv$ amount of product j to be produced under

      feasible conditions

$k^p_i \equiv$ amount of resource i available under feasible

      conditions

$gj(yj) \equiv$ utility function of producing yj units

      of product j.

Then potential capacity involves the firm's existing
level of technology and its utilization by the available labor
and management; i.e. it's a firm-oriented measure. But the firm
is exposed to several external factors such as electricity cuts,
expensive credits, low demand, transportation problems, inadequate

communication system, bureaucratic difficulties etc. They influence the firm adversely decreasing capacity. This results in actual capacity.

Actual Capacity: It is the capacity created under actual circumstances. It takes into account not only the internal but external factors as well. Therefore, it is normally less than potential capacity.

$$\text{Max } C_3 = \sum_{j=1}^{n3} hj(zj)$$

$$\underline{A}_A \ \underline{z} \ \leq \ \underline{k}^A \tag{IV.3}$$

$$\underline{z} \ \geq \ \underline{0}$$

where

$$\underline{A}_A \ = \ \left\| a_{ij}^A \right\| \quad , \text{ or}$$

$$\underline{A}_A = \begin{pmatrix} a_{11}^A & a_{12}^A & \cdots & a_{1n_3}^A \\ a_{21}^A & a_{22}^A & \cdots & a_{2n_3}^A \\ \cdot & & & \\ \cdot & & & \\ \cdot & & & \\ \cdot & & & \\ a_{m_31} & \cdots & & a_{m_3n_3}^A \end{pmatrix}$$

$$\underline{k}^A = [k_1^A , \ \dots \ , \ k_{m_3}^A]$$

$$\underline{z} = [z_1 , \ \dots \ , \ z_{n_3}]$$

$$\underline{0} = [0 , \ \dots \ , \ 0]$$

$$a_{ij}^A \equiv \text{amont of resource i consumed by one unit}$$
$$\text{of product j under actual conditions}$$

$i = 1, \ldots, m_3$

$j = 1, \ldots, n_3$

$z_j \equiv$ amount of product j to be produced under actual conditions

$k_i^A \equiv$ amount of resource i available under actual conditions

$h_j(z_j) \equiv$ utility function of producing zj units of product j.

Some Observations:

1) Relationship between three capacities can be defined as $c_3^O \leq c_2^O \leq c_1^O$.

2) Constraints pertaining to A can be linear or nonlinear. (IV.1.),(IV.2.),(IV.3.) must be solved with the right optimization techniques to obtain c_1^O, c_2^O, c_3^O respectively, where $c_1^O = \sum_{j=1}^{n_1} f_j(x_j^O)$ $c_2^O = \sum_{j=1}^{n_2} g_j(y_j)$, $c_3^O = \sum_{j=1}^{n_3} h_j(z_j^O)$.

3) Utility functions, i.e. $f_j(x_j)$, $g_j(y_j)$, $h_j(z_j)$ may denote gross profit or turnover, then objective function will be "total gross profit", "total turnover" or corresponding "total production".

4) The three capacities must be defined in the same manner and measured with the same units, i.e. if ideal capacity is defined as total gross profit then feasible capacity and actual capacity must also be defined as total gross profit.

5) Number of product types under actual conditions, n_3, is different than those under feasible conditions, n_2, and ideal conditions, n_1, because product types and number of product types usually differ according to the conditions they are being exposed to.

6) Similarly, number of constraints under actual conditions, m_3, is different then those under feasible conditions, m_2, and actual conditions, m_1.

7) Consequently, utility functions, $fj(xj)$ $gj(yj)$, $hj(zj)$ are different from each other.

In order to increase level of competitiveness, remedies must be searched to bring C_3 close to C_2, and C_2 close to C_1. This immediately brings up the problem of promoting efficiency impromevement. In view of the capacity definitions made above three types of efficiencies have been defined:

Potential (Feasible) Efficiency: Ideal capacity can be regarded as a goal for the firm. Then ideal capacity can be compared with the potential capacity in order to find out how close the firm could approach her goal, that is to what extent is the existing potential being utilized by top level management to attain the goal without considering the external factors? It is therefore a measure of the level of performance of top level management. It shows how efficiently they have used the existing "man-machine system" and monetary resources to come

close to the ideal capacity. The more potential capacity approaches ideal capacity, the more top level management's success is. Then Potential Efficiency is formulated as

$$E_{Firm}^{P} = \frac{C_2^O}{C_1^O} = \frac{P^O}{I^O}$$

Actual Efficiency: Next comes the question of utilization of the facilities provided by top level management, that is how efficiently it is being utilized by middle management and technical staff... This can be answered by comparing actual capacity with potential capacity. Then actual efficiency is formulated as

$$E_{Firm}^{A} = \frac{C_3^O}{C_2^O} = \frac{A^O}{P^O}$$

General Efficiency: Measurement of level of performance of top level management or middle management and technical staff in isolation cannot be an indicator for the overall performance of the firm. The firm must be regarded as a system in order to measure her overall efficiency. This brings up the general efficiency, which is measured as

$$E_{Firm} = E_{Firm}^{P} = E_{Firm}^{A} = \frac{C_2^O}{C_1^O} \cdot \frac{C_3^O}{C_2^O} = \frac{C_3^O}{C_1^O} = \frac{A^O}{I^O}$$

If ideal conditions are defined as the conditions of the most powerful competitor then this measure will show the relative position of the firm with respect to her competitor.

Appropriate Technology and Cost Superiority

When Fig IV.1. is analysed it is seen that appropriate technology-cost superiority is the most important factor that influences level of competitiveness together with general efficiency. Appropriate technology-cost superiority concept has been developed in order to find out to what extent the employed technology brings cost superiority to the firm with respect to her competition in terms of unit manufacturing cost.

Let

$r_i \equiv$ unit cost of basic production input i to the competitor

$b_i \equiv$ unit cost of basic production input i to the firm

Then firm will be advantageous in terms of unit manufacturing cost of its production input if $(\frac{r_i}{b_i}) > 1$, disadvantageous (i.e. competitor will be advantageous) if $(\frac{r_i}{b_i}) < 1$, A firm can have cost advantage in some production inputs and disadvantage in some others. If she employs a technology that uses more of the inputs she is advantageous and less of the inputs she is disadvantageous she can attain cost superiority. Let α_i be defined as the ratio of unit cost of basic production input i to total unit manufacturing cost. If $(\frac{r_i}{b_i}) < 1$, firm will be advantageous if α_i is a small per cent and disadvantageous if α_i is a big per cent. α_i is a coefficient that links appropriate technology with unit manufacturing cost showing the degree of importance of advantage and disadvantage. Then appropriate technology cost superiority of the firm is defined as

$$\beta_F = \sum_{i=1}^{n} \frac{r_i}{b_i} \cdot \alpha_i$$

where $\beta_F \equiv$ Appropriate technology-cost superiority index for the firm

$n \equiv$ Number of total basic production inputs

$$\beta_F = \begin{cases} < 1 & \text{firm does not have technology-cost superiority} \\ 1 & \text{firm is indifferent to her competitor in terms of} \\ & \text{technology-cost superiority} \\ > 1 & \text{firm has technology-cost superiority} \end{cases}$$

In order to compute actual β_F actual α_i must be used.   One may, however, question the values of α_i which will give the maximum β_F.   Then appropriate technology-cost superiority can be modeled as follows:

$$\text{Max} \quad \beta_F = \sum_{i=1}^{n_4} \frac{r_i}{b_i} \alpha_i$$

$$\underline{A}_T \underline{\alpha} \leq \underline{k}^T \qquad\qquad\qquad \text{(IV.4)}$$

$$\underline{\alpha} \geq \underline{0}$$

where

$$\underline{A}_T = \|a_{ij}\|$$

$$\underline{\alpha} = [\alpha_1, \ \ldots \ \alpha_{n_4}]$$

$$\underline{k}^T = [\ k_1^T, \ \ldots, \ k_{m_4}^T]$$

$$\underline{0} = [0, \ \ldots, \ 0]$$

$a_{ij}^T \equiv$ amount of resource i consumed by one unit of product j

$$i = 1, \ \ldots \ , \ m_4$$

$j = 1, \ldots, n_4$

$k_i^T \equiv$ amount of resource i available

Constraints of (IV.4) involve the input and technological constraints pertaining to employed technology. Appropriate technology-cost superiority of the competitor, β_C, on the other hand, will be formulated like β_F but b_i and r_i switch their positions. If $(\frac{b_i}{r_i}) > 1$ competitor will be advantageous in terms of cost of ith basic production input. If $(\frac{b_i}{r_i}) < 1$ competitor will be disadvantageous. In view of this configuration

$$\hat{\beta}_C = \sum_{i=1}^{n} \frac{b_i}{r_i} \, \gamma_i$$

where $\gamma_i \equiv$ ratio of unit manufacturing cost of ith basic production input to total unit manufacturing cost for the competitor.

It is, however, quite difficult to find γ_i for it involves detailed cost knowledge about the competitor; which is not always possible to find - particularly if the competitor is foreign). Then another formula has been suggested, which is quite easy in terms of implementation:

$$\beta_C = \sum_{i=1}^{n} \frac{b_i}{r_i} \, \alpha_i$$

In this way, appropriate technology-cost superiority of the competitor can be "guessed". If β_C is used instead of $\hat{\beta}_C$ this will give an advantage to the competitor for $\beta_C \gtrless \hat{\beta}_C$. In the sequel this relationship will be explained:

Let $\quad \alpha_i = \dfrac{b_i q_i}{\sum\limits_{j=1}^{n} b_j q_j}$, $\forall_i$. $\qquad \gamma_i = \dfrac{r_i q'_i}{\sum\limits_{j=1}^{n} r_j q'_j}$, $\forall_i$

$$b_i > 0, \quad r_i > 0, \quad q_i > 0, \quad \forall_i$$

where $q_i \equiv$ amount of basic production input i necessary to

produce one unit of the product for the firm

$q'_i \equiv$ It is defined like q_i but it is for the competitor

then

Lemma 1: $\sum\limits_{i=1}^{n} \dfrac{b_i}{r_i} \gamma_i \leq \sum\limits_{i=1}^{n} \dfrac{b_i}{r_i} \alpha_i$

Lemma 2: $\sum\limits_{i=1}^{n} \dfrac{r_i}{b_i} \alpha_i \leq \sum\limits_{i=1}^{n} \dfrac{r_i}{b_i} \gamma_i$

A simulation run was made, where parameters are normally distributed and seen that Lemma 1 and Lemma 2 were true for all cases (1000 cases) [19].

Then $\hat{\beta}_C$ will always give an advantage to the competitor presenting C in an optimistic manner for the competitor and pessimistic manner for the firm, where C is explained below.

In view of the definitions made above, the mathematical model developed has been illustrated in Fig. IV.2.

In Fig. IV.2., <u>Competitive Potential</u> of a firm, M_F, which is a product of cost superiority and general efficiency, measures the composite performance of the basic functional areas of a firm such as top management, middle management, technical staff, labor force exposed to internal and external factors. It is,

however, a firm-oriented measure and don't express the relative position of the firm among her competitors. A measure, which compares the firm's level of performance with her competitors' is therefore required.

Level of competitiveness: It is a ratio of firm's competitive potential to her competitor's competitive potential and is formulated as

$$C = \frac{M_F}{M_C}$$

where $M_F = \beta_F \, E_F$

$M_C = \beta_C \, E_C$

$M_C \equiv$ Competitive potential of the competitor

C is an index which indicates the relative position of the firm in terms of competitiveness within the relevant framework. Therefore, it is a meaningful measure in showing her performance with respect to her competitors.

M_F is the actual competitive potential of the firm. Feasible Competitive Potential of the firm, M_F^F can be formaluted as

$$M_F^F = \beta_F \, E_F^P$$

Actual Competitive Potential of the firm, M_F^A, on the other hand, is formulated as

$$M_F^A = \beta_F \, E_F^A$$

IV.1.2. Statement of the Model

This model is an attempt to understand how competitiveness behaviour results from the corporate structure where corporate structure is influenced by many interactions between parts of the company, and the company and her environment. At times interactions tend to be more important than components; this makes the coordination of the actions of different functional areas more important than policy designs by functional areas. Within this framework, the objective of the model is to study the interaction of different functional areas and their impact on level of competitiveness index. It is focused on the composite level of performance of the functional areas; that is to say different functional areas have not been analysed in isolation, because corporate performance is determined by the composite performance of the functional areas. Analysis of functional areas in isolation will lead to misallocation and misuse of resources; moreover the best policy or action plan for each functional area will not necessarily result in the best policy set for the company as a whole [12].

Ideal Capacity Model

$$\text{Max} C_1 = \underset{j}{\le} \quad f_j(x_j)$$
$$\underline{A}_I \, \underline{x} \le \underline{k}$$
$$\underline{x} \ge \underline{0}$$

Ideal Capacity

$$I^O = \underset{j}{\le} \quad f_j(x_j)$$

Appropriate Technology Model

$$\text{Max} \, \beta = \underset{i}{\le} \frac{r_i}{b_i} \, \propto_i$$
$$\underline{A}_T \propto \, \le \, \underline{k}^T$$
$$\propto \ge \underline{0}$$

Potential Capacity Model

$$\text{Max} \, C_2 = \underset{j}{\le} \quad g_j(y_j)$$
$$\underline{A}_P \, \underline{Y} \le \underline{k}^P$$
$$\underline{Y} \ge \underline{0}$$

Potential Capacity

$$P^O = \underset{j}{\le} \quad g_j(y_j)$$

Potential Efficiency

$$E^P = \frac{P^O}{I^O}$$

Cost Superiority Model

$$\beta^O = \underset{i}{\le} \frac{r_i}{b_i} \, \propto_i^O$$

General Efficiency

$$E = E^P \cdot E^A = \frac{A^O}{I^O}$$

Actual Efficiency

$$E^A = \frac{A^O}{P^O}$$

Actual Capacity Model

$$\text{Max} \, C_3 = \underset{j}{\le} \quad h_j(z_j)$$
$$\underline{A}_A \, \underline{z} \, \le \, \underline{k}^A$$
$$\underline{z} \ge \underline{0}$$

Actual Capacity

$$A^O = \underset{j}{\le} \quad h_j(z_j)$$

COMPETITIVE POTENTIAL OF A FIRM

$$M_F = \beta_F^O \cdot E_F$$

Fig. Iv.2. Competitive Potential of a firm.

IV.2. Computational Procedure

Ideal capacity, potential capacity and actual capacity were found by the questions employed in the questionnaire (See questions III.15, III.16, III.17 in the questionnaire in Appendix I). Based on these results, potential efficiency, actual efficiency and general efficiency were calculated. Then β_F and β_C were calculated according to b_i, α_i values asked in the questionnaire (See question II.15 in the questionnaire in Appendix I) and r_i values which were obtained from Italy. Consequently, M_F was calculated for the twelve Turkish firms. Then the procedure was repeated for the foreign firms in order to calculate M_C. Here, it was not possible to find ideal, potential and actual capacities for the foreign firms. Consequently, potential and actual efficiencies could not be calculated. But it was possible to find the average general efficiency (3). Therefore, M_C and then C could be computed. Here are two examples showing the procedure:

> EXAMPLE I
>
> Cotton yarn producing plant
>
> (Throughout the study, five basic production inputs are considered: raw material, labor, energy, depreciation, finance and other expenses)

---

(3) Source: EEC Information Bureau, Brussels Belgium.

i	α_i	b_i	r_i	UNIT
1 (cotton)	0.46	240.00	245.12	TL/kg
2 (labor)	0.26	250.00	1071.00	TL/kg
3 $\begin{pmatrix} \text{Fueloil} \\ \text{Electricity} \end{pmatrix}$ 0.088		34.00	32.27	TL/lt
		6.75	7.77	TL/KW
4 (depreciation)	0.03	1.00	1.00	-
5 (finance)	0.172	0.45	0.14	-

Depreciation ratio $\dfrac{r_4}{b_4}$ has been assumed to be 1 since it is very difficult to find it for foreign firms. r_5 and b_5 are the current interest rates in Turkey and Italy respectively.

$$\beta_F = (0.46)\left(\frac{245.12}{240.00}\right) + (0.26)\left(\frac{1071.00}{250.00}\right) +$$

$$(0.088)\left[(0.10)\left(\frac{32.27}{34.00}\right) + (0.90)\left(\frac{7.77}{6.75}\right)\right] + (0.03)(1.00) +$$

$$(0.172)\left(\frac{0.14}{0.45}\right) = 1.77$$

Here, since the firm produces yarns only, 10% of her average energy consumption is fuel oil and 90% is electricity. This is valid for yarn and/or fabric production. But for textiles producing firms, 30% of the energy consumed is electricity and 70% is fuel oil since finishing processes require steam.

$$\beta_C = (0.46)\left(\frac{245.12}{240.00}\right) + (0.26)\left(\frac{250.00}{1071.00}\right) +$$

$$(0.088) \quad (0.10) \left[\left(\frac{34.00}{32.27} \right) + (0.90) \left(\frac{6.75}{7.77} \right) \right] \quad +$$

$$(0.172) \left(\frac{0.45}{0.14} \right) = 1.17$$

$$M_F = \beta_F \, E_F = 1.77 \times 0.70 = 1.24$$

$$M_C = \beta_C \, E_C = 1.77 \times 0.90 = 1.06$$

$$C = \frac{M_F}{M_C} = \frac{1.24}{1.06} = 1.17$$

EXAMPLE II

A woolen textiles producing plant

i	α_i	b_i	r_i	UNIT
1 (wool)	0.48	1097.00	1009.59	TL/kg
2 (labor)	0.28	294.60	1071.00	TL/hr
3 $\begin{pmatrix} \text{fuel oil} \\ \text{electricity} \end{pmatrix}$	0.04	34.00 6.75	32.27 7.77	TL/lt TL/KW
4 (depreciation)	0.02	1.00	1.00	–
5 (finance)	0.18	0.45	0.14	–

$$\beta_F = (0.48) \left(\frac{1009.59}{1097.00} \right) + (0.28) \left(\frac{1071.00}{294.60} \right) \quad +$$

$$(0.04) \left[(0.30) \left(\frac{7.77}{6.75} \right) + (0.70) \left(\frac{32.27}{34.00} \right) \right] +$$

$$(0.02) \, (1) + (0.18) \left(\frac{0.14}{0.45} \right) = 1.58$$

$$\beta_C = (0.48)\left(\frac{1097.00}{1009.59}\right) + (0.28)\left(\frac{294.60}{1071.00}\right) +$$

$$(0.04)\left[(0.30)\left(\frac{6.75}{7.77}\right) + (0.70)\left(\frac{34.00}{32.27}\right)\right] + (0.02)(1) +$$

$$(0.18)\left(\frac{0.45}{0.14}\right) = 1.24$$

$$M_F = 1.58 \times 0.50 = 0.79$$

$$M_C = 1.24 \times 0.87 = 1.08$$

$$C = \frac{0.79}{1.08} = 0.73$$

Firm is advantageous if $C > 1$ and disadvantageous if $C < 1$.

IV.3. Computer Programme and the Solution

A computer programme has been designed in order to calculate explicitly the behavioral consequences of the model and study model response to different scenorius. The flow-chart of the model is presented in Fig. IV.3.

Here,

RN $\equiv$ random numbers

BF $= \beta_F$

BC $= \beta_C$

AF $= \alpha$

R $= r$

CF $= M_F$

P $= E_F$

B $= b$

```
                    ┌─────────────┐
                   (    START     )
                    └──────┬──────┘
                           │
                    ┌──────┴──────┐
                    │ GENERATE RN │
                    └──────┬──────┘
                           │
                    ┌──────┴──────┐
                    │    READ     │
    (α)◄- - - - - - └──────┬──────┘
                           │
                    ┌──────┴──────┐
                    │ SET INITIAL │
                    │ CONDITIONS  │
                    └──────┬──────┘
                           │
                    ╱──────┴──────╲
         ┌─ - - - ⟨     DO         ⟩
         │        ⟨ I=1,12 K=1,5   ⟩
         │         ╲──────┬──────╱
         │                │
         │     ┌──────────┴──────────────────────────┐
         │     │ BF(I) = BF(I) + AF(I,K) * (R(I,K)/B(I,K) ) │
         │     └──────────┬──────────────────────────┘
         │                │
         │     ┌──────────┴──────────────────────────┐
         │     │ BC(I) = BC(I) + AF(I,K) * (B(I,K)/R(I,K) ) │
         └- - -└──────────┬──────────────────────────┘
                          │
                   ╱──────┴──────╲
     ┌─ ─ ─ ─ ─ ─⟨  DO    I = 1,12 ⟩
     │            ╲──────┬──────╱
     │                   │
     │            ┌──────┴──────┐
     │            │ CF(I) = BF(I)*P(I) │
     │            └──────┬──────┘
     │                   │
     │            ┌──────┴──────┐
     │            │ CC(I) = BC(I)*PP(I) │
     │            └──────┬──────┘
     │                   │
   ( X )              ( A )
```

BF(I) = BF(I) + AF(I,K) * (R(I,K)/B(I,K))

BC(I) = BC(I) + AF(I,K) * (B(I,K)/R(I,K))

CF(I) = BF(I)*P(I)

CC(I) = BC(I)*PP(I)
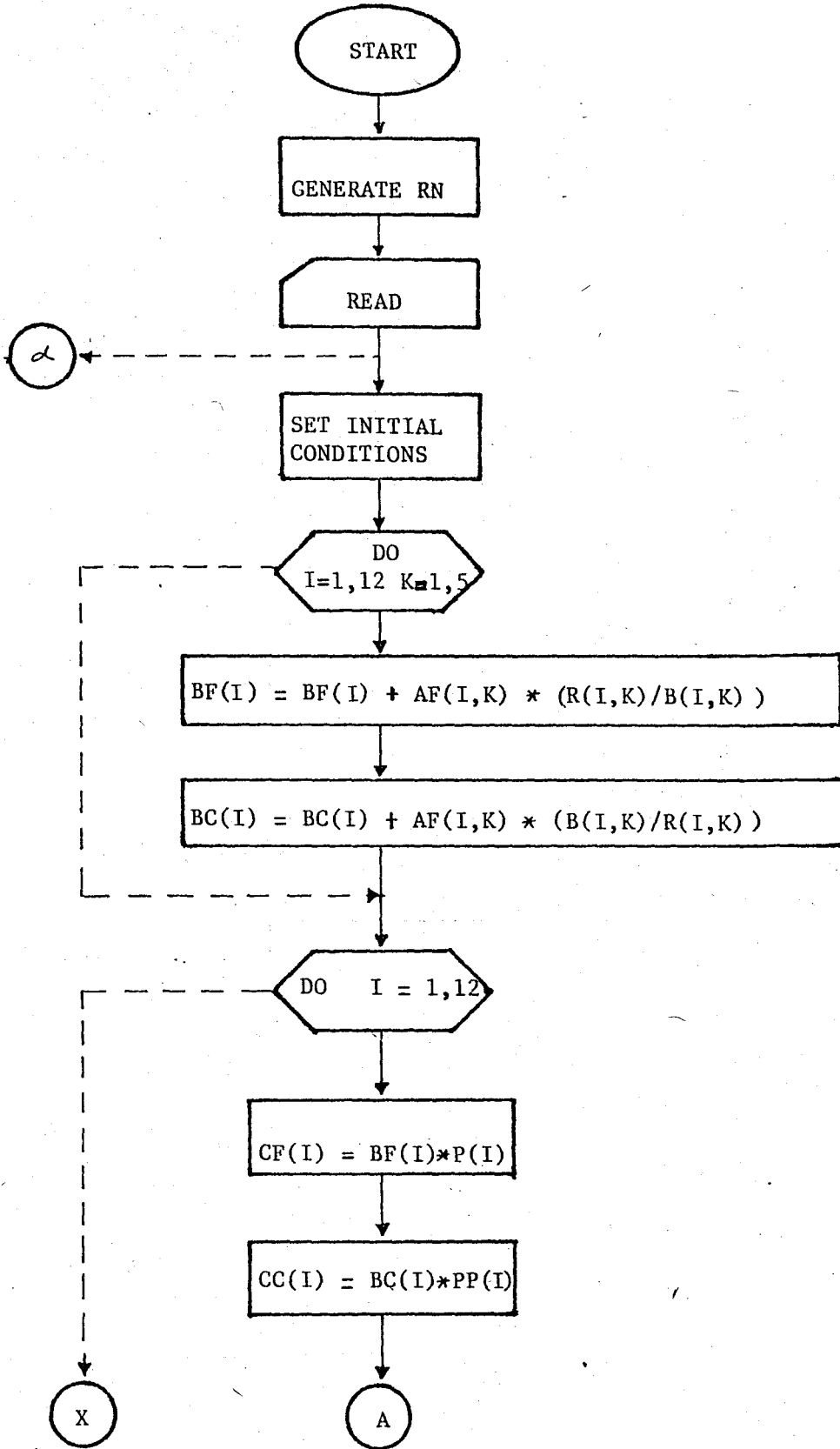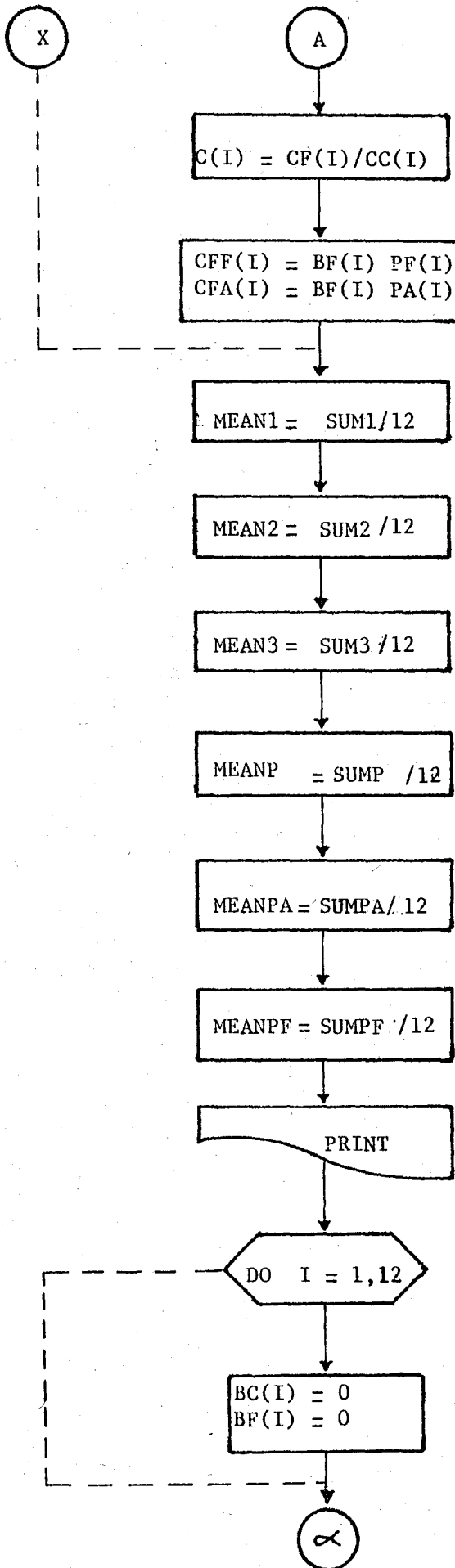
Fig IV.3. The Computer Programme.

$$CC = M_C$$
$$PP = E_C$$
$$CFF = M_F^F$$
$$PF = E_F^P$$
$$CFA = M_F^A$$
$$PA = E_F^A$$

The results of the computer programme are shown in Table IV.1. The competitor is a typical Turkish firm for the local market and a typical Italian firm for the foreign market. Among all the foreign countries, Italy has been chosen particularly, for she is not only one of the major competitors in the world market (See Table IV.2.) but is similar to Turkey in many ways as well.

The firm can be a yarn, textiles or clothing manufacturer or her production facilities can be integrated; the competitor is selected in accordance with the firm's type of products, for example if the firm produces yarns, she is compared with a yarn producing firm. Moreover, if she produces cotton yarns, her competitor is a cotton yarn manufacturer.

When Table IV.1. is observed, one immediately notices the cost superiority of Turkish firms over her foreign competitors. It's the general efficiency which decreases the competitive potential of Turkish firms. Cost superiority of Turkish firms basically results from the low labor costs. It is possible to

see from Table IV.3. that this is a discriminating advantage for Turkish firms, but productivity of a Turkish worker is not equal to productivity of a foreign worker. According to a survey made by an International consulting Firm in 1981 (6), productivity of a Turkish textile worker is 41% of the productivity of an American textile worker; i.e. an American worker produces the amount that 2.5 Turkish workers can produce. This fact has been taken into account in the actual efficiency and the general efficiency of a firm is thus reflected in her competitive potential. In spite of the low productivity, labor cost in Turkey is still cheap compared to labor costs in foreign countries.

The second discriminating advantage of Turkish firms results from relatively cheap cotton prices in Turkey. Most of the textile firms located in Aegean and Mediterreanean regions are the owners of major cotton fields in these regions. Therefore, they are able to obtain the cotton directly from the field and consequently in a cheap way. Firms located in Marmara region, particularly in Istanbul pay slightly more for cotton due to transportation costs. Therefore, firms using cotton as the raw material are more advantageous than their foreign competitors. The firms using wool and synthetic fibers are, however, disadvantageous: Turkey imports wool from Australia like the other

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(6) Source: 'Kalkınma Planlarında Tekstil Endüstrisi', Doç. Dr. Işık Tarakçıoğlu, Ege University.

FIRM	COST SUPERIORITY INDEX		EFFICIENCY				COMPETITIVE POTENTIAL				LEVEL OF COMP. INDEX
	Firm	Competitor	Firm			Competitor	Firm			Competitor	
	β_F	β_C	Actual E_F^A	Feasible E_F^F	General E_F	General E_C	Actual M_F^A	Feasible M_F^F	General M_F	General M_C	$C = \dfrac{M_F}{M_C}$
1	LM:0.92 FM:1.58	1.11 1.24	0.50	1.00	0.50	0.71(4) 0.90(5)	0.79	1.58	0.46 0.79	0.79 1.11	0.58 0.71
2	1.05 1.55	0.97 1.32	0.54	0.75	0.41	0.71(4) 0.90(5)	0.84	1.16	0.43 0.04	0.69 1.19	0.62 0.54
3	1.12 2.40	0.92 1.28	0.88	0.66	0.58	0.71(4) 0.90(5)	2.11	1.59	0.65 1.39	0.65 1.15	1.00 1.21
4	0.83 1.25	1.22 1.49	0.89	0.90	0.80	0.71(4) 0.90(5)	1.11	1.12	0.66 1.00	0.87 1.34	0.76 0.74
5	1.20 1.95	1.05 0.96	0.91	0.96	0.87	0.71(4) 0.90(5)	1.77	1.87	1.04 1.69	0.75 0.86	1.39 1.96
6	1.04 1.51	0.97 1.29	0.82	0.94	0.78	0.71(4) 0.90(5)	1.24	1.42	0.81 1.18	0.69 1.16	1.17 1.02
7	0.98 1.24	1.02 1.54	0.87	0.92	0.80	0.71(4) 0.90(5)	1.08	1.14	0.78 0.99	0.72 1.39	1.08 1.72
8	0.95 1.96	1.07 0.97	0.91	1.00	0.91	0.71(4) 0.90(5)	1.78	1.96	0.86 1.78	0.76 0.87	1.13 2.04
9	0.80 1.69	1.30 1.25	0.97	0.85	0.83	0.71(4) 0.90(5)	1.64	1.43	0.66 1.40	0.92 1.13	0.72 1.24
10	0.85 1.77	1.21 1.17	0.93	0.75	0.70	0.71(4) 0.90(5)	1.65	1.32	0.60 1.24	0.86 1.06	0.70 1.17
11	1.00 2.50	1.07 1.10	0.81	0.67	0.54	0.71(4) 0.90(5)	2.03	1.67	0.54 1.35	0.76 0.99	0.71 1.36
12	1.01 1.54	0.99 1.26	0.85	0.96	0.82	0.71(4) 0.90(5)	1.31	1.48	0.83 1.27	0.70 1.14	1.19 1.11
MEAN	0.98 1.75	1.08 1.27	0.82	0.86	0.71	0.71 0.90	1.45	1.48	0.69 1.23	0.76 1.12	

(4) Actual efficiency of a typical Turkish firm has been taken as 0.71 depending on $\bar{E}_F$

(5) EEC Information Bureau, Brussels

Table IV.2. Leading Exporters of Textiles(1979)

Country	Value of Exports(million dollars)
W.Germany	8662
Italy	8545
France	5441
Hong Kong	4829
S.Korea	4683
U.K.	4446
Japan	4358
U.S.	4147
Belgium/Lux.emburg	4135
Turkey	442.7
Turkey(1981)	1045.6

Source: ' Kalkınma Planlarında Tekstil Endüstrisi '
        Doç.Dr. Işık Tarakçıoğlu, Ege University

Table IV.3. Labor Costs in Textile Industry(Summer 1981)

Country	Average total cost/employee hr(¢)
Switzerland	8.18
W.Germany	8.17
Italy	7.23
U.S.	7.03
U.K.	5.57
Japan	4.90
Spain	4.48
Mexico	3.06
Portugal	1.88
Hong Kong	1.42
S. Korea	1.35
Taiwan	1.32
Turkey	1.07
Phillipines	0.43
Sri Lanka	0.16

Source: 1981 Werner International Report

West European countries but pays slightly more due to import
scale (amount imported is usually insufficient to benefit from
discounts due to large quantities).

In spite of this, the difference in wool prices is small,
but there's a big difference in synthetic fiber costs - the syn-
thetic textiles prices in West Germany are on the average 30%
less then those produced in Turkey.

Fuel oil and electricity prices are almost the same in
West Europe and Turkey, - electricity is slightly less in Turkey.
Therefore, none of the countries has a discriminating advantage
in terms of energy costs. Energy utilization in West Europe is,
however, better compared to Turkey because of her well estab-
lished infrastructure. This fact has been reflected in the
actual efficiency and the general efficiency of the firm.

Raw materials, labor and energy constitute almost 80% of
the unit manufacturing cost and are therefore crucial. The
remaining 20% consists of depreciation and finance costs among
which finance being very important. Finance costs has been
taken as the current interest rate. It is on the average 45%
in Turkey and 14% in Italy (12-16% in the other West European
countries). This shows that the Turkish firm can't obtain
capital as cheap as her competitor does and consequently faces
many financial problems in making investments. This situation
has even caused production stagnation in a number of firms.
Depreciation cost has been taken as 1.00 for both Turkish and

foreign firms. This assumption is made, because depreciation cost depends entirely on the particular firm chosen and it's not possible to make a generalization about it (for the foreign firms). So, it is assumed that both the firm and the competitor compete under equal circumstances in terms of depreciation.

When the results for the foreign market are analysed in Table IV.1. it is seen that Turkish companies are in a better position than their competitors in terms of cost superiority with the exception of two firms (the fourth and the seventh). This advantage is, however, adversely affected by the low general efficiency of Turkish firms. In spite of this, Turkish firms have attained better level of competitiveness indices than their competitors. There are only four firms (the first, the second, the fourth and the seventh) who have realized the level of competitiveness index below 1.00: the first two of them had very low general efficiencies, the other two showed good performance in terms of the general efficiency but didn't have cost superiority over their competitors. Table IV.4., shows the possibility of the improvement that can be achieved if the feasible competitive potential is fully used.

The indices calculated for the local market show the relative position of Turkish firms with respect to each other. Recently, Turkey has made bilateral agreements with many countries - particularly with Middle East countries. Bilateral agreements eliminate the foreign competitors from the market. Then the

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Table IV.4. Comparison of C and C'

FIRM	LEVEL OF COMPETITIVENESS INDEX	
	$C = \dfrac{M_F}{M_C}$	$C' = \dfrac{M_F'}{M_C}$
1	0.71	1.42
2	0.54	0.97
3	1.21	1.38
4	0.74	0.84
5	1.96	2.17
6	1.02	1.22
7	0.72	0.82
8	2.04	2.25
9	1.24	1.27
10	1.17	1.25
11	1.36	1.69
12	1.11	1.30

indices calculated for the local market show the relative position of a Turkish firm with respect to other Turkish firms in the case of bilateral agreements.

It is observed that competitive potential of many firms in the local market is below 1.00. These are the firms located in Istanbul, where raw material and labor costs are relatively more expensive than the other regions in Turkey. But in the local market, cost advantage more or the less disappears and competitive strength depends largely on the general efficiency.

The best performance is shown by the firms located in Mediterranean region.

i) Local market

	Firm	region	C
1.	Firm 5	(Mediterranean)	1.39
2.	Firm 6	(Istanbul)	1.17
3.	Firm 8	(Mediterranean)	1.13

ii) Foreign market

	Firm	region	C
1.	Firm 8	(Mediterranean)	2.04
2.	Firm 5	(Mediterranean)	1.96
3.	Firm 11	(Istanbul)	1.36

The poor performance, on the other hand, has been a consequence of the low general efficiency as shown below:

i) Local market

	Firm	Region	C
1.	Firm 1	(Istanbul)	0.58
2.	Firm 2	(Aegean)	0.62
3.	Firm 11	(Istanbul)	0.71

ii) Foreign market

	Firm	Region	C
1.	Firm 2	(Aegean)	0.54
2.	Firm 1	(Istanbul)	0.71
3.	Firm 7	(Istanbul)	0.72

Although Firm 11 showed very good performance in the foreign market her performance was very poor in the local market. This can be attributed to her low labor costs: when she's compared with the foreign competitor the low labor costs brings her a discriminating advantage, but when she's compared with Turkish competitor it brings only a marginal jump and her low efficiency completely washes up this advantage.

The general efficiency in Table IV.1. is the final efficiency realized by the firm, for example if the firm produced yarns and textiles, general efficiency of the textiles section has been taken into consideration. It's, however, possible to analyse the general efficiency realized in each section in order to study the technological relationships between different sections. This analysis has been made for the twelve Turkish firms so as to find out the average performance of yarn, textiles and-clothing Industries respectively:

The average general efficiency realized in Yarn Industry: $\bar{E}_{Yarn} = 0.75$, the average general efficiency realized in Textiles Industry: $\bar{E}_{Textiles} = 0.70$, the average general efficiency realized in Clothing Industry: $\bar{E}_{Clothing} = 0.62$.

Compared to Yarn and Textiles Industries, Clothing is a more labor intensive industry which enables the maximum employment with the minimum investment. Therefore, it must be the most important branch of Turkish Textile Industry, but the results show that it is the one that is utilized with the least efficiency.

Capacity of yarns is not being fully utilized by textiles. This can be attributed to the capacity bottleneck that appears in the finishing department of textiles; that is there are no major problems till the end of fabrics, capacity of finishing department is, however, usually inadequate and it is the department where the major quality and efficiency problems arise.

IV.4. The Scenarios

A parametric analysis has been made under different scenarios in order to study the interaction between important factors and competitive potential. In the sequel, this analysis will be described:

I) Contribution of general efficiency to Competitive Potential:

General efficiency of Turkish firms chosen for this study are in the range of [0.41,0.91] having an average of 0.71. General efficiency of foreign firms, on the other hand, are in the range of [0.80,0.95] having an average of 0.90..

RUN A: General efficiency of foreign firms has been changed from 0.90 to 0.85 which decreases the mean competitive potential of the competitor from 1.16 to 1.054 and improves the level of competitiveness to the advantage of Turkish firms.

RUN B: General efficiency of foreign firms has been changed from 0.90 to 0.95 which increases the mean competitive potential of the competitor from 1.116 to 1.178 and improves the level of competitiveness to their advantage. In spite of this, $\overline{M}_F$ (1.226) is still greater than $\overline{M}_C$ (1.178).

RUN C: Random, numbers have been generated between 0.41 and 0.91, and 0.80 and 0.95 as the general efficiency of Turkish firms and foreign firms respectively. 5 different data sets have been generated like that and in each case Turkish firms keep their superiority over their competitors.

RUN D: General efficiency of Turkish firms has been decreased by i) 5% and ii) 10% respectively, which decreases competitive potential by 5% and 10% respectively in return. General efficiency of foreign firms has been taken as 0.90. With 5% decrease Turkish firms could keep their superiority ($\overline{M}_F$ = 1.166 and $\overline{M}_C$ = 1.116), but 10% decrease has passed over the superiority to foreign firms ($\overline{M}_F$ = 1.103 and $\overline{M}_C$ = 1.116).

RUN E: It's the same as Run D but general efficiency of foreign firms has been taken as 0.85. This time, Turkish firms could keep their superiority in both cases: i) 5% decrease: $\overline{M}_F = 1.166$ and $\overline{M}_C = 1.054$ ii) 10% decrease: $\overline{M}_F = 1.103$ and $\overline{M}_C = 1.054$.

RUN F: It's the same as Run D but general efficiency of foreign firms has been taken as 0.95. In both cases, foreign firms had superiority over Turkish firms: i) 5% decrease: $\overline{M}_F = 1.166$ and $\overline{M}_C = 1.178$ ii) 10% decrease: $\overline{M}_F = 1.103$ and $\overline{M}_C = 1.178$ (See Scenario I in Appendix II).

It's seen that 0.65,0.70 is the critical range for Turkish firms in terms of general efficiency. A poorer performance passes over the superiority completely to foreign competitors. It must be noted that most of the Turkish firms are operating with this critical efficiency at the moment. An increase in the general efficiency, on the other hand, improves Turkish Competitive Potential a lot, because the Turkish firm does have the cost superiority over her competitors. It is the poor efficiency which influences the competitive potential adversely. If she can improve her efficiency, which is not so difficult to do since she underutilizes her feasible potential (See Table IV.4), she will be one of the major competitors in the inter-national market. A great many of her competitors cannot avoid high manufacturing costs due to high raw material and labor costs, therefore if she can couple her low manufacturing costs

with high efficiency she will be equipped with an outstanding competitive strength.

Table IV.5. presents the improvement that Turkish firms can achieve with high efficiency.

Table IV.5. General Efficiency Versus Competitive Potential

E_C	E_F	$\overline{E}_F$	$\overline{M}_F$	$\overline{M}_C$
0.90	5% increase	0.75	1.290	1.116
0.90	10% increase	0.78	1.337	1.116
0.90	15% increase	0.81	1.404	1.116
0.90	20% increase	0.84	1.451	1.116
0.90	25% increase	0.87	1.491	1.116
0.95	5% increase	0.75	1.290	1.178
0.95	10% increase	0.78	1.337	1.178
0.95	15% increase	0.81	1.404	1.178
0.95	20% increase	0.84	1.451	1.178
0.95	25% increase	0.87	1.491	1.178

II) Contribution of Raw Material Costs to Competitive Potential

Cotton, wool and cotton yarn projections for 1982 August/ 1983 August period have been used to study the interaction bet-

ween raw material and competitive potential (7). Cotton projec-
tions have been made for Turkey (Adana, İzmir) and Italy. Cotton
yarn projections have been made for Turkey and Italy. (Clean)
wool projections have been made for Australia and then transpor-
tation cost has been added for Turkey and West Europe respecti-
vely.

RUN A: Projections for August - September 1982 period
have been used.

RUN B: Projections for October - November 1982 period
have been used.

RUN C: Projections for December 1982 - January 1983 pe-
riod have been used.

RUN D: Projections for February - March 1983 period
have been used.

RUN E: Projections for April - May 1982 period have
been used.

RUN F: Projections for June - July 1983 period have been
used. (See Scenario II in Appendix II)

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(7) Source: - Cotton Outlook
            - I.W.S. Nominee Company Limited Turkey (Istanbul) Branch
              (Australian Wool Corporation)
    Data beyond this period was not available. Cotton prices, which show
    seasonal fluctuations, depend on several factors such as amount of cotton
    that hes remained from the previous year, weather, government policy etc.
    Therefore, it is quite hard to forecast the cotton prices for the
    long run.

It's seen that Turkish firms keep their superiority over their competitors. Due to cheap cotton and cotton yarn prices, Turkey can keep her superiority over her competitors for a long time under normal circumstances. It is interesting to note that relative position of Woolen Textile and Clothing manufacturing firms (1,3,6,7) do not really change.

III) Contribution of Labor Costs to Competitive Potential

Labor costs of the twelve Turkish firms are in the range of [139.58,294.60] having an average of 209.37 TL/hr. Labor costs in Italy, on the other hand, are in the range of [900.00, 1242.00] having an average of 1071.00 TL/hr.

RUN A: Random numbers have been generated between 139.58 and 294.60, and 900.00 and 1242.00 as the labor costs in Turkey and Italy respectively.

Turkey keeps her superiority over her competitors due to her labor costs.

RUN B: Turkish labor costs have been increased by i) 10% ii) 20% iii) 30% iv) 40% v) 50% respectively. Then each increase has been compared to foreign labor costs, which has been taken as 1071.00 TL/hr (The current price that is used in Table IV.1.).

Turkey loses her superiority only when Turkish labor costs are increased by 20% or more.

RUN C: It's the same as Run B, but foreign labor costs are increased by 5%.

When Turkish labor costs are increased by 30% or more Turkey loses her superiority.

RUN D: It's the same as Run B, but foreign labor costs have been increased by 10%.

When Turkish labor costs have been increased by 30% or more Turkey loses her superiority.

RUN E: It's the same as Run B, but foreign labor costs have been increased by 15%.

When Turkish labor costs have been increased by 40% or more Turkey loses her superiorty.

RUN F: It's the same as Run B, but foreign labor costs have been increased by 20%.

When Turkish labor costs have been increased by 40% or more Turkey loses her superiority.

RUN G: It's the same as Run B, but foreign labor costs have been increased by 25%.

When Turkish labor costs have been increased by 50% or more Turkey loses her superiority.

RUN H: It's the same as Run B, but foreign labor costs have been increased by 30%.

When Turkish labor costs have been increased by 60% or more Turkey loses her superiority.

(See Scenario III in Appendix II)

It's observed that the low labor cost in Turkey is the most important factor which enables her cost superiority over her competitors.

IV) Contribution of interest rates to Competive Potential

The interest rate had been taken as 0.45 in Turkey and 0.14 in Italy.

RUN A: The interest rate in Turkey is taken as i) 0.40 ii) 0.35 iii) 0.30 iv) 0.25 v) 0.20 vi) 0.14 respectively and foreign interest rate is taken as 0.14. As Turkish interest rate decreases $\overline{M}_F$ shows a marked difference. When interest rates of the firm and the competitor is the same, which is 0.14, $\overline{M}_F = 1.31$ and $\overline{M}_C = 0.77$ and the difference becomes remarkable.

RUN B: The interest rate in Turkey is taken as i) 0.45 ii) 0.40 iii) 0.35 iv) 0.30 v) 25 vi) 0.20 vii) 0.14 respectively. Foreign interest rate is taken as 0.20. Since foreign interest rate has increased the gap between $\overline{M}_F$ and $\overline{M}_C$ increases more.

RUN C: The interest rate in Turkey is taken as i) 0.50 ii) 0.60 respectively and each case is compared with the foreign interest rate that's taken as 0.14. When interest rate is taken

as 0.60 Turkey loses her superiority ($\overline{M}_F$ = 1.22, $\overline{M}_C$ = 1.28).

RUN D: It is the same as Run C but foreign interest rate is taken as 0.20. Turkey keeps her superiority in cases i) - $\overline{M}_F$ = 1.24, $\overline{M}_C$ = 1.01 - and ii) - $\overline{M}_F$ = 1.23, $\overline{M}_C$ = 1.08 -.

(See Scenario IV in Appendix II)

V) Contribution of Subsidy to Competitive Potential

If government subsidizes the woolen textile sector in Turkey Turkey can compete with woolen textile exporting countries and expand her market segment.

RUN A: Wool price in Turkey has been decreased by 8% and made equal to the foreign wool price. Then cost of Turkish woolen textiles has been decreased by small amounts every time until it is equal to the cost of foreign woolen textiles. Although this change influences only four firms it brings an important improvement on the average Turkish competitive potential, there-fore subsidy for wool must be proposed to government, particular-ly if full membership of Turkey to EEC is accepted. (See Scé-nario V in Appendix II)

VI) Contribution of General Efficiency and Raw Material
        Costs to Competitive Potential

This scenario is a combination of scenarios (I) and (II):

RUN A: Random numbers have been generated in the range of [0.41, 0.91] and [0.80, 0.95] as the general efficiency of

Turkish firms and foreign firms respectively. Then each case is coupled with 1982/1983 raw material projections. (See Scenario VI in Appendix II). It's observed that Turkish firms keep their superiority over their competitors in each case. The difference between $\bar{M}_F$ and $\bar{M}_C$ becomes remarkable in VI - IV/D set for $\bar{E}_F$ =0.73.

VII) Contribution of General Efficiency and Labor Costs
        to Competitive Potential

This scenario is a combination of scenarios (I) and (III); i.e. random numbers have been generated in the range of $[0.41, 0.91]$ and $[0.80, 0.95]$ as the actual efficiency of Turkish firms and foreign firms respectively. Then each case has been coupled with labor cost projections.

RUN A: Turkish labor costs have been increased by 1) 10% 2) 20% 3) 30% 4) 40% 5) 50% respectively. For each increase, 5 different sets of random data have been generated as the general efficiency of Turkish and foreign firms.

RUN B: It is the same as Run A, but foreign labor costs have been increased by 5%.

RUN C: It is the same as Run A, but foreign labor costs have been increased by 10%.

RUN D: It is the same as Run A, but foreign labor costs have been increased by 15%.

RUN E: It is the same as Run A, but foreign labor costs have been increased by 20%.

RUN F: It is the same as Run A, but foreign labor costs have been increased by 25%.

RUN G: It is the same as Run A, but foreign labor costs have been increased by 30%.

RUN H: Random numbers have been created between 139.58 and 294.60, and 900.00 and 1242.00 as the labor costs in Turkey and Italy respectively.   Then it is coupled with each set of random data set that is generated as the general efficiency of Turkish and foreign firms.

(See Scenario VII in Appendix II)

The cases where Turkish firms lose their superiority over their competitors have been described below:

RUN A: Case (a); 2nd and 5th data set

        Case (b); 2nd, 3rd and 5th data set

        Case (c); 1st, 2nd, 3rd and 5th data set

        Case (d); All

        Case (e); All

In 4th data set of case (c), Turkey keeps her superiority in spite of the 30% increase due to relatively high general efficiency.   This repeats itself in the following runs as well.

RUN B: Case (a); None

        Case (b); 2nd, 3rd, 5th, data set

        Case (c); 1st, 2nd, 3rd, 5th data set

Case (d); 1st, 2nd, 3rd, 4th, 5th data set

Case (e); 1st, 2nd, 3rd, 4th, 5th data set

RUN C: Case (a); None

Case (b); 2nd, 5th data set

Case (c); 2nd, 3rd, 5th data set

Case (d); 1st, 2nd, 3rd, 5th data set

Case (e); All

RUN D: Case (a); None

Case (b); None

Case (c); 2nd, 5th data set

Case (d); 2nd, 3rd, 5th data set

Case (e); All

RUN E: Case (a); None

Case (b); None

Case (c); 5th data set

Case (d); 2nd, 3rd, 5th data set

Case (e); 1st, 2nd, 3rd, 5th data set

RUN F: Case (a); None

Case (b); None

Case (c); None

Case (d); 2nd, 5th data set

Case (e); 2nd, 3rd, 5th data set

RUN G: Case (a); None

Case (b); None

Case (c); None

Case (d); None

Case (e); 2nd, 3rd, 5th data set

RUN H: Turkish firms keep their superiority in each case.

In all cases it's seen clearly how poor efficiency washes up the cost superiority of Turkish firms. If general efficiency is above 0.70 - as in 4th data set - Turkish firms keep their superiority even though Turkish labor costs increase. [0.65-0.70] is, however, the critical region for all firms. When cost superiority decreases competitive strength immediately disappears if general efficiency is also low as in 2nd, 5th, and 3rd data set. They are more vulnerable to cost increase.

VIII. Contribution of General Efficiency and Interest Rates to Competitive Potential

It is a combination of scenarios (I) and (IV).

RUN A: Foreign interest rate has been taken as 0.14. Turkish interest rates has been taken as 1) 0.40 2) 0.35 3) 0.30 4) 0.25 5) 0.20 6) 0.14 respectively. For each case, 5 different sets of random data have been generated as the general efficiency of Turkish and foreign firms.

RUN B: It is the same as Run A, but foreign interest rate has been taken as 0.20.

RUN C: Foreign interest rate has been taken as 0.14. Turkish interest rate has been taken as a) 0.50 b) 0.60 recpectively. For each case, 5 different sets of random data have been generated as the general efficiency of Turkish and foreign firms.

RUN D: It is the same as Run C, but foreign interest rate has been taken as 0.20.

(See Scenario VIII in Appendix II)

Turkish firms lose superiority in Run C, in case (a), 5th data set; case (b), 1st, 2nd, 3rd, 5th data set. In the other cases Turkish firms keep their superiority with a marked difference. Particularly in Run B this difference becomes striking. Then cheap credits for Textile Sector must certainly be proposed to government.

In addition, the distinction between random data sets (general efficiency) become more clear in this scenario:

For instance, in Run A1/ii: $\overline{M}_F = 1.15$, $\overline{M}_C = 1.03$ ($\overline{E}_F = 0.66$, $\overline{E}_C = 0.88$) whereas in Run A1/iv: $\overline{M}_F = 1.26$, $\overline{M}_C = 1.02$ ($\overline{E}_F = 0.73$, $\overline{E}_C = 0.86$). Even a small increase in general efficiency improves our Competitive Potential a lot: Run A1/i: $\overline{M}_F = 1.21$, $\overline{M}_C = 1.01$ ($\overline{E}_F = 0.68$, $\overline{E}_C = 0.86$).

The distinction increases as Turkish interest rates decrease. When interest rates become equal to each other in Run A6/ (i = 0.14) and in Run B5 (i = 0.20), in case (iv), $\overline{M}_F = 1.34$,

$\overline{M}_C = 0.74$ ($\overline{E}_F = 0.73$, $\overline{E}_C = 0.86$) where $\overline{M}_F$ is almost twice bigger than $\overline{M}_C$..

IX) Contribution of General Efficiency and Subsidy to Competitive Potential:

It is a combination of scenarios (I) and (V), Run A: Turkish wool price has been decreased by 8% and made equal to foreign wool price: Run B,C,D,E: Cost of Turkish woolen textiles has been decreased by small amounts respectively until it is made equal to the cost of foreign woolen textiles. Each run has been coupled with 5 different sets of random data that have been generated as the general efficiency of Turkish and foreign firms. (See Scenario IX in Appendix II)

In each case, Turkish firms keep their superiority, the improvement in Competitive Potential of firm 1, which is a consequence of general efficiency rather than subsidy is remarkable. In Run A/i $M_{\text{Firm } 1} = 1.37$ and $M_{\text{Competitor } 1} = 1.03$, where $E_{F1} = 0.85$ and $E_{C1} = 0.86$. In Run A/iii, on the other hand, $M_{\text{Firm } 1} = 0.89$ and $M_{\text{Competitor } 1} = 1.00$, where $E_{F1} = 0.55$ and $E_{C1} = 0.84$. In Run A, amount of subsidy is the same for all five set, it is only the general efficiency that is changing and Run A/i and Run A/iii emphasize the importance of general efficiency. In Run A/iv, $M_{F1} = 1.03$ and $M_{C1} = 0.97$, where $E_{F1} = 0.64$ $E_{C1} = 0.81$. So a little improvement in general efficiency immediately elevates the firm. In Run E, where costs of Turkish and foreign textiles are the same, there's a marked difference between $\overline{M}_F$

and $\overline{M}_C$. In case E/i) $\overline{M}_F = 1.23$ $\overline{M}_C = 1.03$ ($\overline{E}_F = 0.73$ $\overline{E}_F = 0.86$)

E/iv) $\overline{M}_F = 1.28$ $\overline{M}_C = 1.03$ ($\overline{E}_F = 0.68$ $\overline{E}_F = 0.86$)

But low $\overline{E}_F$ immediately shows its adverse effect as in case E/ii $\overline{M}_F = 1.16$ $\overline{M}_C = 1.04$ ($\overline{E}_F = 0.66$, $\overline{E}_C = 0.88$).

X) Contribution of Raw Material and Labor Costs to Competitive Potential

It is a combination of scenarios (II) and (III). 1982/83 raw material projections have been coupled with labor projections.

RUN A: Turkish labor costs have been increased by 10%. It is coupled with 1982/1983 raw material projections. Then foreign labor costs have been increased by 1) 5% 2) 10% 3) 15% respectively.

Turkish firms keep their superiority in each case. The more foreign labor costs increase, the more the superiority is.

RUN B: Turkish labor costs have been increased by 20%. It is coupled with 1982/1983 raw material projections. Then foreign labor costs have been increased by 1) 5% 2) 10% 3) 15% 4) 20% respectively.

As in Run A Turkish firms keep their superiority.

RUN C: Turkish labor costs have been increased by 30%. It is coupled with 1982/1983 raw material projections. Then foreign labor costs have been increased by 1) 5% 2) 10% 3) 15% 4) 20% 5) 25%.

Turkish firms lose their superiority in cases (1) and partially (2). Superiority passes over to them again in cases (3), (4) and (5).

RUN D: Turkish labor costs have been increased by 40%. It is coupled with 1982/1983 raw material projections. Then foreign labor costs have been increased by 1) 5% 2) 10% 3) 15% 4) 20% 5) 25% 6) 30% 7) 35%.

Turkish firms lose their superiority in cases (1),(2),(3). At the beginning of case (4) they keep pace with their competitors and go ahead in cases (5),(6),(7).

(See Scenario X in Appendix II)

This scenario depicts the discriminating advantage of Turkish firms against their competitors clearly. Turkish firms lose their superiority only if the amount of increase in Turkish labor costs is bigger than the amount of increase in foreign labor costs, which is not so probable for the unionism in West Europe is stronger than Turkey as suggested by ILO (8). In any case, minimum wages is incomparably small in Turkey. As a consequence of high labor turnover, most of the workers in Turkish Textile Industry work with minimum wages. So even 40% or 50% increase do not elevate the wages significantly.

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(8) ILO Year Book of Labour Statistics.

XI)   Contribution of Raw Material Costs, Labor Costs
      and General Efficiency to Competitive Potential

This scenario is combination of scenarios (I), (II) and
(III).

RUN A: 1982 August - 1983 May raw material projections
(first 5 data sets only) have been coupled with 5 random data
sets generated as the general efficiency of Turkish and foreign
firms. Turkish labor costs have been increased by 10%. Then
foreign labor costs have been increased by 1) 5%   2) 10%   3) 15%
respectively.

RUN B: It is the same as Run A, but Turkish labor costs
have been increased by 20% and foreign labor costs have been
increased by 1) 5%   2) 10%   3) 15%   4) 20%   respectively.

RUN C: It is the same as Run A, but Turkish labor costs
have been increased by 30% and foreign labor costs have been
increased by 1) 5%   2) 10%   3) 15%   4) 20%   5) 25% .

RUN D: It is the same as Run A, but Turkish labor costs
have been increased by 40% and foreign labor costs have been
increased by 1) 15%   2) 20%   3) 25%   4) 35%.   (See Scenario XI
in Appendix II)

Turkish firms lose their superiority in the following runs;
RUN B1/ii, B2/v, that is 2nd and 5th random data sets of B1.

RUN C1/ii, C1/iii, C1/v

RUN C2/ii, C2/iii, C2/v

RUN C3/ii, C3/v

RUN D1/ii, D1/iii, D1/v

RUN D2/ii, D2/iii, D2/v

RUN D3/ii, D3/v

It is interesting to note that Turkish firms never lose their superiority if average general efficiency is over 0.66, namely cases (i) and (iv), where $\overline{E}_F = 0.68$ and $E_F = 0.73$ respectively in spite of labor cost increases. Briefly speaking, observations about labor costs and general efficiency are the same as in the previous scenarios.

It would be interesting to have the scenarios of

i) contribution of raw material costs, labor costs and subsidy to competitive potential

ii) contribution of raw material costs, labor costs, interest rates and general efficiency to competitive potential

iii) contribution of raw material costs, labor costs, intere rates, subsidy and general efficiency to competitive potential.

Since the number of possible permutations increase a lot it is not made. The trend is, however, clear and it is possible to arrive at some conclusions about the level of performance of the Sector.

V. COMPETITIVENESS ANALYSIS OF TURKISH
TEXTILE INDUSTRY

V.1. Yarn Sector

V.1.1. Cotton Yarn

The cotton textile industry is a long established, essential sector of the industrial scene in Turkey. Traditionally, Turkey has been a grower and exporter of raw cotton fibre and manufacturer of yarns and woven fabrics which were sold predominantly on the home market. Regulations covering imports of yarns and fabrics as well as made-up clothing are clear and simple imports of these products for commercial sale are not allowed.

During the last decade, the industry underwent a transformation as a result of a massive investment. During five-year (1972-1975) textile expansion program government allocated $ 1 billion for this sector raising the capacity of Spinning from 1.300.000 spindles to 3.100.000 spindles (9) and large-scale cotton yarn processing was coupled with a reduction in raw cotton

(9) Source: 'World Cotton Markets, New Stabilization Proposals and Turkey', Contribution from Turkey to the Fourth Preparatory Meeting on Cotton (TD/P/IPC/COTTON/L4).

exports. At the moment, 3.500.000 spindles (10) can produce
more than 457.000 tons of cotton if there are no electricity
cuts [14]. Neither foreign nor home market can, however, absorb
this production. The major foreign customers are EEC countries,
who import 90% of our total cotton yarn exports. It is not
possible to increase this amount, which is 75.000 tons and sa-
tisfies 40% of EEC market demand (as of 1981) [24] due to anti-
damping measures taken by the community. Therefore, Turkish
firms must penetrate into new markets to increase cotton yarn
exports, for the remaining excess cotton yarn cannot be fully
utilized by the home weaving sector: During 1972-77 period
weaving sector was not subsidized. The economy policy of
encouraging the investments in Spinning and Weaving Sectors
has been discontinued due to the recession began in the world
economy at the end of 1975. Then on, the firms, per se, could not
attempt capacity expansion in weaving for fixed rate of exchange guarantee was
dropped in 1977. Those who attempted faced serious financial problems due to
accumulated   interest rates and undervaluation of TL against foreign currer

   Consequently, there is a disparity between cotton Spinning
and Weaving Sectors, which raises the capacity bottleneck in
Weaving Sector. Then

   i) The home cotton weaving sector must be subsidized by
the Government to attian higher capacities and to adapt new
technologies

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(10) By the end of 1981, number of spindles have risen to 3.500.000.

ii) New foreign markets must be found to export cotton yarn.
urkish cotton yarn can compete with foreign cotton yarns in
erms of its price quantity and quality.

In view of this observation in the Industry cost superiority
f Turkish firms in terms of cotton yarns and textiles have been
malysed in Scenarios II,VI,X,XI and the results have been pre-
ented in Tables II, VI, X, XI in Appendix II. In Table II,
he relative position of Turkish firms with respect to their
ompetitors do not change; under normal circumstances - i.e.
mless there is very bad weather, abrupt changes in political
ituation and so forth - cost advantage of Turkish firms will
revail. This advantage still remains under different general
fficiencies. Even when the average Turkish general efficiency
strikes the bottom with 0.66, Turkish firms keep their superiority;
as presented in Tables VI-B, VI-C, VI-E. When it hits the top
with 0.73, cost superiority becomes a discriminating advantage
(Table VI-D). Scenarios X andXI consider raw material costs
coupled with labor costs, where the relative position of Turkish
firms do not change. In spite of the inflation, cotton prices
will not boost in the coming years, since its minimum and maximum
prices are dictated by the government. In Tables X-C, X-D, XI-B,
XI-C, XI-D Turkish firms lose their superiority because of
very unlikely possibilities that can occur in labor costs.
Those runs are taken only to see the cut off points in the com-
petitive potential between Turkish firms and her competitors.

Briefly speaking the cost advantage in cotton will prevail in the coming years; the marketing activities, are however, inadequate. The marketing activities of the twelve firms are mainly joining exhibitions and fairs. They have no special funds allocated for advertisement of their products abroad. They don't have branch offices there and their sales force is often inadequate in terms of foreign languages (See Questions II.59, II.60, II.61 in the questionnaire in Appendix I).

In view of this analysis, excess cotton yarn can be channellized by government measures - such as providing cheap investment credits for weaving sector - on the home market, and firm oriented measures - e.g. improving marketing skills which will increase the actual efficiency of the firms - on the foreign markets.

V.1.2. Woolen Yarn

Like many European countries Turkey imports wool from Australia or New Zealand. But the cost of woolen textiles produced in Europe (Italy, West Germany, Switzerland and so forth) is 30% cheaper than the woolen textiles produced in Turkey. This results from the government regulation about 'tops' (11). In order to initiate tops production in Turkey, the government applies 60% customs duty to tops import and makes it very ex-

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(11) Tops is an intermediate product in Textile Industry. The wool that is trimmed from the animal - which is called 'dirty wool' - is greasy. Therefore, it's first washed to obtain 'clean wool' (when it is washed it loses 20 to 80% of its original weight depending on the sheep type)

pensive. Turkish plants, however, do not have enough combing machines for tops production. Then government should certainly subsidize this sector by i) providing cheap credits to buy combing machines in the long run and/or ii) lessening customs duty applied to tops import in the short run. This case has been considered in scenarios V and IX, and observed that it increases the competitive potential of firms 1,3,6,7 forming a more homogeneous competitiveness structure (See Scenarios V and IX in Appendix II)

V.1.3. Synthetic Yarn

In terms of synthetic yarns Turkey doesn't have much chance to compete with her competitors. Synthetic yarns are cheaply produced in Europe, because raw material is cheap and available.

Raw materials for synthetic yarn production are, however, imported in Turkey and therefore expensive. Resulting from this synthetic textiles are more expensive than those produced in Europe. Moreover, the quality is not continuously maintained, because the necessary raw materials are not always available and the firms cannot be selective. At this point, the government should take measures in the favor of chemical industry in Turkey. Only then, competitiveness in synthetic textiles can be taken into account. Therefore, it is early to allocate a subsidy for

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Then, it is corded and combed to produce long and parallel fibers which is called tops. Only then, it can be spun into woolen yarn. Unlike the other fibers, the combing process here necessitates many combing machines. Therefore this process is more expensive than it is in the production of other type of yarns.

synthetic sector in the coming Five Year Plan, for the problem of ancillary industry is not resolved yet. In view of this, observation, subsidy to synthetic sector is not considered in this study.

V.2. Weaving and Finishing Sector

As mentioned in Section IV.1. weaving sector was not subsidized simultaneously with spinning sector, which was a fatal error, and there is a capacity bottleneek in weaving sector. 80% of the looms in Turkey are shuttle looms (some of them being hand looms!...) which are inadequate in facilitating a continuous production satisfactory in quality and amount. This technology must be exchanged with the "appropriate technology". It is of utmost importance for it projects its problems directly to spinning sector (by not utilizing the excess cotton yarn production) and confection sector (by not providing sufficient cloth).

Weaving must be considered together with Finishing, where another major problem arises. As a consequence of the technology used, finishing processes at Turkish plants cannot provide continuous, qualified and large scale production of textiles. In addition to this, most of the chemical materials used in finishing processes, particularly dyes, are imported and therefore they are expensive and are not continuously available. Problem of ancillary industry, once more, raises itself as a bottleneck.

Currently, the finishing sector underutilizes the gray good that comes from the weaving loom. Therefore, the capacity, which is increasingly decreasing in terms of vertical integration, plagues the overall textile sector. This is cited in this study as follows:

$$\overline{E}_{yarns} = 0.75$$
$$\overline{E}_{textiles} = 0.70$$
$$\overline{E}_{clothing} = 0.62$$

V.13. Clothing Sector

Unlike the weaving sector, there is a fierce competition in clothing sector in the local market, because textiles produced is unsatisfactory in terms of amount and quality. Capacity bottleneck, in this way, projects itself to the final sub-sector of Textile Industry.

Clothing Sector, by nature, provides the

i) maximum employment with minimum investment,

ii) minimum electricity consumption/worker

iii) export with the maximum value added

In spite of this, it is being utilized with the minimum efficiency as mentioned above: $\overline{E}_{clothing} = 0.62$. It is interesting to note that the least general efficiencies, pertain to clothing manufacturing firms, namely firm 2 with $E_F = 0.41$ and firm 1 with $E_F = 0.50$. This situation primarily results from

small scale production in these plants. Consequently, they have their orders made by subcontractors, which causes many quality and delivery time problems.

So, although clothing is a labor – intensive sector, where labor cost is our biggest advantage, it is being utilized with the least efficiency resulting from problems pertaining to firms and the government policy. Some of these problems observed in the Industry can be stated as follows:

i) In terms of machinery and equipment Turkey is dependent upon foreign countries in this sector. Production of sewing machines in Turkey is still at an infant stage.

ii) All spare parts, – including the pin of the sewing machine – are imported.

iii) The age of a sewing machine is 5-10 years. It must be renewed every 5-10 years. Therefore, production of sewing machines and the necessary spare parts must be tackled in the short-run.

iv) The accesories such as zipper, button are entirely imported. Therefore, this industry also has been established before the 'ancillary industry has been set up. It is interestin to note that in spite of the abundancy of cotton yarn in Turkey, amount of sewing thread produced is insufficient and their quality is very bad. During sewing, they often break and decrease the productivity of the worker.

v) In spite of the low labor costs unit manufacturing cost of a clothing is more than it should be because of waste.

Cutting and garmenting processes are not done by scientific methods and therefore wasted material cannot be reduced.

vi) Clothing sector works with the available but not the required textiles, therefore at the very beginning the quality problem is introduced.

At this point, it must be noted that Textile is not a homogeneous sector and it cannot be. Therefore, problems can only be tackled by completing the _vertical integration_ of the Industry. Otherwise, the different but interdependent problems of each sector will continue projecting their problems to each other, which will gradually curb the competitive strength of Turkish firms on the foreign markets.

IV.4. General Efficiency

'... today's industrial engineer should be able to make meaningful contributions to increasing the national productivity for maintaining a competitive position in the international market To do this, consideration must be given to increasing the productivity of the enterprise as a whole, along with improving the efficiency ...' [4] This supports the conclusion that corporate efficiency can be measured by the position of the managed enterprise in her competitive environment. In other words, poor effi-

ciency can be considered as the Achilles' heel for competitiveness

When Tables in Appendix II are observed it is seen that [0.65, 0.70] is the critical general efficiency range for Turkish firms. When general efficiency is over 0.70 firms keep their competitive strength in spite of unfavorable conditions - such as increasing Turkish labor costs by 30% and foreign labor costs by only 10%. When it is 0.66, however, their raw material and labor costs advantage drops and when it is below 0.66 they lose their superiority completely as presented in Tables III,X, XI in Appendix II. In XI-C1, XI-C2, XI-C3 Turkish firms keep their superiority when $\bar{E}_F$ is 0.68 or 0.73 but lose when $\bar{E}_F$ is 0.66, which emphasizes the limits of the critical region.

The average general efficiency is 0.71. Turkish firms keep their superiority when foreign $\bar{E}_F$ is 0.85 (Table I-A) and is 0.95 (Table I-B). This superiority continues with random data set as well (Tables I-C/i, I-C/ii, I-C/iii, I-C/iv, I-C/v). When their existing general efficiency is reduced by i) 5% ii) 10% their superiority continues if foreign $\bar{E}_F$ is 0.85 (Tables I-E/i, I-E/ii); lose it in case (ii) if foreign $\bar{E}_F$ is 0.90 (Tables I-D/i, I-D/ii); lose it in both cases if foreign $\bar{E}_F$ is 0.95 (Tables I-F/i, I-F/ii). In case (i) Turkish $\bar{E}_F$ becomes 0.68 and in case (ii) it drops to 0.64.

It is, in fact, the cost advantage which permits the competitive strength of firms on the foreign markets. In the local market level of competitiveness indices (Table IV.1.) are lower

than those in the foreign market, because labor costs are not so different from each other. And it is only their efficiency which elevates or pushes them down. Therefore, internal competition is more fierce than competition against foreign firms. There is, however, a regional differentiation in labor costs in Turkey. In Mediterranean regions average labor cost (180 TL/hr) is lower than average labor cost in Istanbul(240 TL/hr). This is due to unregistered young labor as complained by some of Istanbul firms.

I should also mention the fact that labor turnover in Turkish Textile Industry is high due to two factors: i) Most of the workers are women and they don't work for a long time (due to marital, maternal reasons) ii) In order to decrease the labor costs, managers keep the number of laborers working with minimum wages as large as possible and give rise to unskilled labor. As a consequence of these factors, average experience of a laborer is not more than 5 years (See question 11-49 in the questionnaire in Appendix I) and the high turnover becomes an important factor in decline of general efficiency.

VI. DISCUSSION AND CONCLUSION

The progress made by Turkey in European and Middle East markets in the last decade owes much to her cost advantage, which is dominated by low cotton and labor costs. Lack of modern and organized technological structure and managerial rationalization of work methods however, bleak the competitive strength of Turkish firms in the international market.

In view of this configuration, fiscal and development policies of the Government are the most powerful tools for shaping the future pattern of the growth of Textile Industry. Formulation of a long-term and comprehensive policy is necessary.

The policy should cover targets, time schedules, alternative approaches and the role of other manufacturing sectors. In view of this study, long term objectives for Turkish Textile Industry can be stated as follows:

a) Choice and transfer of appropriate technology for Weaving and Finishing Sector in order not only to produce better product but also to incorporate economies of scale and provide better capacity utilization, and improve/complete vertical integration of the industry.

b) Formation of textile chemistry industry and the other ancillary industries

c) Formation of large scale production in clothing sector

d) Support of access to better financing in order to supply sufficient working capital, because labor-intensive textile industry does not need much investment cost but a high operating cost

e) Concerted action of government, management and labor to remove the impediments to higher efficiency

f) Production of the textile machinery of the employed technology

g) Specialization in certain production techniques - such as printing - and materials - such as tops -

h) Establishment of more technician training schools

Of the factors determining corporate behaviour, the company has direct control only over corporate policies and goals. The function of corporate planning should be therefore the design of policies that yield acceptable performance independent of competitor actions and market changes. Corporate planning should first ensure that company policies are not creating poor behaviour, in other words the firm should select and implement the right policy that will exploit her "potential capacity" as much as possible so as to improve her "potential efficiency". Then

planning should design policies capable of responding to, or taking advantage of, changes in the market or competitor actions in order to reach an acceptable "general efficiency". It is, however, important to be aware of the interactions between different types of efficiencies in order not to undermine the corporat

The objectives stated, on the other hand, require the concerted action of the government and corporate. They have to be conceived and implemented in a coherent manner, because the different elements affecting textiles are inderdependent. All necessary steps are to be taken to avoid adverse side effects.

Thus the impact of such policies should not be considered in isolation (as it had been done during 1972-1977) because possible disparities and contradictions between them will plague the sector intensifying the problems.

REFERENCES

[1] Ansoff M.I., <u>Corporate Strategy</u>, New York, 1965.

[2] Commission of the European Countries, <u>Commission Communication to the Council on the Situation and Prospects of Textile Industry and Clothing Industries in the Community</u>, Brussels, 27th July 1981.

[3] <u>Cotton Outlook</u>, Vol. 59, (1981), Vol. 60 (January - June 1982)

[4] Dewitt F., 'Productivity, and the Industrial Engineer', Productivity: A Series from Industrial Engineering, <u>AIIE</u>, Atlanta, January 1976.

[5] <u>Eurostatistics</u>, Luxembourg, April 1982.

[6] Gluck F.W., Kaufman S.P. and Walleck A.S., 'Strategic Management for Competitive Advantage', Harvard Business Review, Number 4, July - August 1980.

[7] Hall, A.J., <u>The Standard Handbook of Textiles</u>, New York, 1975

[8] Isaacs M. III, 'Electronics in Textiles', <u>Textile World</u>, Volume 132, Number 1, January 1982

[9] <u>ITMF</u>, 1981 International Production Cost Comparison Spinning/Weaving, Zurich, 1981

[10] İktisadi Araştırmalar Vakfı, <u>İplik-Dokuma-Konfeksiyon Üretim ve İhracatı ile ilgili Sorunlar</u>, İstanbul, 1978

[11] Lennox-Kerr D., 'World Textiles 1982', <u>Textile World</u>,Volume 132, Number 1, January 1982

[12] Lyneis, J.M., <u>Corporate Planning and Policy Design</u>, Cambridge Mass., 1980

[13] MPM Endüstri Şubesi, <u>Hazır Giyim Sanayiinde İhracata Yönelme Olanakları</u>, Ankara, 1974

[14] MPM Endüstri Şubesi, <u>Pamuk İpliği ve Pamuklu Dokuma Endüstri</u>

Verimlilik ve Firmalararası karşılaştırma, Ankara, 1981

[15] MPM Endüstri Şubesi, Yerli Hammaddeye Dayalı Endüstrilerin Dışsatım Olanakları ve Karşılaştıkları Sorunlar, Ankara, 1981

[16] MPM Endüstri Şubesi, Yün İpliği ve Yünlü Dokuma Endüstrisinde Verimlilik ve Firmalararası Karşılaştırma, Ankara, 1981.

[17] MPM Endüstri Şubesi, Türkiye İmalat Sanayinde İşgücü Maliyetleri ve AET ile Karşılaştırılması, Ankara, 1981

[18] Oral, Muhittin, Sınai Firmaların Rekabet Gücünü Oluşturan Faktörler Araştırma Metodolojisi, TSKB, İstanbul, October 1981

[19] Oral, Muhittin, Rekabet Gücü, TSKB, İstanbul, August 1982

[20] Porter, M. E., 'How Competitive Forces shape Strategy', Harvard Business Review, Volume 59, Number 2, March-April 1979

[21] Potter, M. D., and Corbman, B. D., Textiles:From Fibers to Fabric, New York, 1962

[22] Steiner M.,'Textile Production with Survival Chances', Melliand Textilberichte, August 1981

[23] Tarakçıoğlu I., 'Dünya Tekstil Endüstrisine Genel Bakış', Ege University, May 1982

[24] Tarakçıoğlu I., 'Kalkınma Planlarında Tekstil Endüstrisi', Ege University, May 1982

[25] Taylor B. and Hawkins K., A Handbook of Strategic Planning, London, 1972

[26] UNCTAD, Fibres and Textiles: Dimensions of Corporate Marketing Structure, Geneva, 19 November 1980

[27] UNIDO, Appropriate Industrial Technology for Textiles, Monogra on Appropriate Industrial Technology No.6, Vienna, 1979

[28] UNIDO, Industrialization of Developing Countries: Problems and Prospects in Textile Industry, Monographs on Industrial Development No.7, Vienna, 1969

[29] WernerInternational Management Consultants, Study Report of the Textile Industry with Recommendations for future Investmen Policies, Volume 1, İstanbul, June 1975

[30] Werner's Research and Development Corporate Services Departme 'A New Measurement- Textile Intensity and its Implication for future World growth', New Twists, Volume 19, Number 3-4, 1980

APPENDIX I

THE QUESTIONNAIRE

REKABET GÜCÜ

BİLGİ FORMU

İMALÂT SEKTÖRÜ   : _____

SİNAİ KURULUŞ   : _____

FABRİKA ADRESİ   : _____

_____

_____

_____

TELEFON NO'LARI
VE DIŞ HAT SAYISI: _____

TELEX NO   : _____

ÜRÜNLERİ   : _____

_____

BÖLÜM I : GENEL BİLGİ

I.1. Sınaî Kuruluşun Adı : _____

I.2. Faaliyet Gösterdiği Sektör : _____

I.3. Kendi Sektörünün Bağlı Bulunduğu Sektörler : _____

_____

I.4. Kendi Sektörüne Bağlı Bulunan Sektörler : _____

_____

I.5. Bağlı Bulunduğu Kuruluş veya Holding : _____

_____

I.6. Kendisine Bağlı Kuruluşlar :

     1. _____

     2. _____

     3. _____

     4. _____

     5. _____

I.7. Kuruluş ve Üretime Geçiş Tarihi :

     Kuruluş : _____ Üretim : _____

I.8. Görüşülen Kişiler ve Görevleri :

Adı ve Soyadı	Görevi
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____

II.1. Yönetim Kurulu Üyeleri ve Özellikleri :

BÖLÜM II : YÖNETİM VE İŞÇİLİK DÜZEYİ

ADI VE SOYADI	MESLEĞİ	EĞİTİM GÖRDÜĞÜ KURULUŞ	SINAÎ TECRÜBESİ (YIL)	YABANCI DİL BİLGİSİ
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

II.2. Üst Kademe Yöneticileri ve Özellikleri
(Yönetim Kurulu üyesi Olanlara x İşareti Konacak)

GÖREVİ	MESLEĞİ	EĞİTİM GÖRDÜĞÜ KURULUŞ	SINAİ TECRÜBESİ (YIL)	YABANCI DİL BİLGİSİ
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

I.3 Üst Kademe Yöneticilerinin Zamanlarını Kullanma Biçimi

														ORTALAMA
İNSANGÜCÜ PLANLAMASI														
YENİDEN ÖRGÜTLENME														
KAPASİTE ARTIRMA														
ÜRETİM TEKNOLOJİ-SİNİ İLERLETME														
MAMUL VE KALİTE GELİŞTİRİLMESİ														
PAZAR ARAŞTIRMASI TALEP TAHMİNİ														
DAĞITIM VE SATIŞ İŞLERİ														
İŞÇİ YÖNETİMİ İŞLERİ														
ÜRETİM İŞLERİ														
TEMEL GİRDİ TEDARİK İŞLERİ														
NAKİT AKIM İŞLERİ														
ÜST KADEME YÖNETİCİSİ GÖREVİ														

DİĞER:

II.4. Üst Kademe Yöneticilerinin İzledikleri Yerli ve Yabancı Yayınlar

YERLİ	YABANCI
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____
7. _____	7. _____
8. _____	8. _____

II.5. Üst Kademe Yöneticilerinin Katıldıkları yerli ve yabancı seminer,
konferans, sınaî sergi ve fuarlar vb faaliyetler sayısı (Son yılla-
rın ortalaması alınacak)

FAALİYET TÜRÜ	KATILMA SAYISI	
	YERLİ	YABANCI
1. Seminer _____	___	___
2. Ortak Çalışma Toplantısı (Workshop)	___	___
3. Kongre,Simpozyum,vb. _____	___	___
4. Sınaî sergi ve fuarlar _____	___	___
5. Özel Eğitim ve Seminer _____	___	___
6. _____	___	___
7. _____	___	___
8. _____	___	___
9. _____	___	___

I.6. Sınaî Kuruluşun Geleceğini etkileyebilecek son yıllardaki yeni
     atılımlar :

1. Üretilmekte olan malların daha da
   geliştirilmesi veya iyileştirilmesi _____ ☐

2. Yeni Mamûl veya mamûllerin
   geliştirilmesi _____ ☐

3. Yeni Üretim teknolojisinin kullanılması _____ ☐

4. Varolan üretim teknolojinin iyileştirilmesi _____ ☐

5. Kapasitenin arttırılması _____ ☐

6. Yeni içpazar bulunması _____ ☐

7. Yeni dışpazar bulunması _____ ☐

8. Yeniden örgütlenme _____ ☐

9. Yeni parasal kaynakların bulunması _____ ☐

10. _____ ☐

11. _____ ☐

12. _____ ☐

13. _____

14. _____

15. _____

.7. Sevk ve İdareciler ve Özellikleri

GÖREVİ	MESLEĞİ	EĞİTİM GÖRDÜĞÜ KURULUŞ	SINAİ TECRÜBESİ (YIL)	YABANCI DİL BİLGİSİ
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				

II.8. Üretim planlamasına yardımcı olabilecek talep veya satış tahmini
yapılıyormu ?

    Evet,yapılıyor _____ ☐

    Hayır,yapılmıyor _____ ☐

    Kısmen yapılıyor _____ ☐

    Sipariş üzerine çalışıldığından
    gerekmiyor _____ ☐

    Diğer (Açıklayınız)_____ ☐

    _____

II.9. Talep veya satış tahmininin kapsadığı süre ve birimler

Süre		Birim		
☐ Haftalık _____	☐ Parasal	☐ Miktar	☐ P+M
☐ Aylık _____	☐ Parasal	☐ Miktar	☐ P+M
☐ Mevsimlik _____	☐ Parasal	☐ Miktar	☐ P+M
☐ 6 Aylık _____	☐ Parasal	☐ Miktar	☐ P+M
☐ Yıllır _____	☐ Parasal	☐ Miktar	☐ P+M
☐ Diğer _____	☐ Parasal	☐ Miktar	☐ P+M

II.10. Talep ve Satış Tahmin Yöntemi

Yöntem	Bilgisayar Kullanımı
☐ İstatistiksel/Matematiksel _____ Yöntem	☐ Evet ☐ Kısmen ☐ Hayır
☐ İ/M + Tecrübe _____	☐ Evet ☐ Kısmen ☐ Hayır
☐ Tecrübeye dayalı yöntem _____	☐ Evet ☐ Kısmen ☐ Hayır
☐ Diğer (Açıklayınız) _____	☐ Evet ☐ Kısmen ☐ Hayır
_____	

:I.11. Mamul karışımının belirlenmesinde kullanılan bilgiler ve gözönünde
bulundurulan hususlar :

1. Mamullerin birim brüt kârları _____ ☐

2. Makina ve teçhizatın bugünkü durum ve
yaşlarıyla üretilebilecek en yüksek
miktarlar _____ ☐

3. Makina ve teçhizatın aralarındaki
işlemler açısından teknolojik ilişki
ve darboğazlar _____ ☐

4. Mekanik bozulma ve duraklamalar _____ ☐

5. Hammadde ve temel üretim girdilerinin
tedarik edilme kayıtları _____ ☐

6. Eldeki işçilik düzeyi _____ ☐

7. İşletme sermayesi düzeyi _____ ☐

8. _____ ☐

9. _____ ☐

10. _____

11. _____

12. _____

I.12. Mamul karışımı belirlenirken gerçekleştirilmeye çalışılan amaç veya
amaçlar (önem sırasına göre)

1. Toplam brüt kârı en yüksek düzeye
   eriştirmek _____

2. Fiziksel kapasiteyi en yüksek düzeyde
   kullanmak _____

3. Üretimin toplam değerini en yüksek
   düzeye çıkartmak _____

4. İnsangücü zamanını en yüksek oranda
   kullanmak _____

5. Teslim sürelerini mümkün olduğu kadar kısa
   yapacak biçimde sipariş kabul etmek _____

6. Diğer (Açıklayınız) _____

   _____

   _____

   _____

II.13. Yukarıdaki amaç veya amaçların gerçekleştirilmesinde kısıtlayıcı
unsurlar (önem sırasına göre)

1. Makina ve teçhizatın fiziksel durumu
   ve üretme kapasiteleri _____

2. Makina ve teçhizattaki bozulma ve
   duraklamalar _____

3. Temel üretim girdilerinin tedarik
   edilme zorluğu _____

4. Eldeki işçilik düzeyi _____

                                                      %

.13 (Devam)

5. İşletme sermayesinin durumu _____ ☐

6. Elektrik ve enerji kısıtlamaları _____ ☐

7. Pazarda pay tutmak için zorunlu
   üretim _____ ☐

8. Diğer (Açıklayınız) _____ ☐

_____

_____

_____

_____

_____

_____

.14. Yukarıdaki kısıtlayıcı unsurları gözönünde bulundurarak amaçlarınızı
     gerçekleştirecek mamul karışımını hangi yöntemle belirliyorsunuz?

Yöntem	Bilgisayar Kullanımı		
Matematiksel optimizasyon _____	☐ Evet	☐ Kısmen	☐ Hayır
Sağduyu ve tecrübe _____	☐ Evet	☐ Kısmen	☐ Hayır
Matematiksel optimizasyon + sağduyu ve tecrübe _____	☐ Evet	☐ Kısmen	☐ Hayır
Diğer (Açıklayınız) _____	☐ Evet	☐ Kısmen	☐ Hayır
_____			
_____			

I.15. Temel üretim girdilerinin alış fiyatlarını ve bunların birim
      maliyetteki yüzdelerini aşağıdaki tabloda belirtiniz.

Temel Üretim Girdisi i	Alış Fiyatı L_i	Birim Maliyetteki Yüzdesi α_i
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
		100

.16. Üretim için gereken işçilik düzeyini ve miktarını nasıl
     belirtiyorsunuz?

II.17. Üretim için gerekli malzeme ihtiyaçını (hammadde, yardımcı madde, işletme malzemesi, ambalaj malzemesi vb.) nasıl bir yöntemle belirliyorsunuz ?

II.18. Malzeme satınalma miktarlarını ve temin yerlerini nasıl ve hangi yöntemle belirliyorsunuz?

II.19. Satın alınan malzemenin uygunluğu ve kalite kontrolu hangi
yöntemle ve kimler tarafından yapılmaktadır?

                                      _____ parasal olarak

Geri çevirme yüzdesi

                                      _____ miktar olarak

II.20. Stok kontrol sisteminiz hangisidir ?

	Sağduyu ve Tecrübe	Matematiksel Model (EOQ, etc)	İstatistiksel Model	Benzetim Modeli (Simulation)	Diğer
Malzeme					
Ara Malzeme					
Mamul Mal					

Bilgisayar kullanımı

    1= Evet;   2= Kısmen;   3= Hayır

Kodlama numaraları sağ-üst köşedeki kutuya konacak

II.21. Stok durumu

	BUGÜNKÜ DURUM		ORTALAMA	
	Miktar(Birim)	Değeri	Miktar (Birim)	Değeri
Malzeme				
Ara Mallar				
Mamul Mal				

II.22. Yıllık stok devir sayısı _____

II.23. Üretim programlanmasında gözönünde bulundurulan hususlar

1. Alının siparişlerin teslim tarihleri _____ ☐

2. Makina ve teçhizatın yüklenme durumları _____ ☐

3. İşçi ve ustabaşı sayısı _____ ☐

4. Ara-stok durumu _____ ☐

5. Hammadde stok durumu _____ ☐

6. Mamul mal stok durumu _____ ☐

7. Enerji kısıtlamaları _____ ☐

8. Diğer (Açıklayınız) _____ ☐

_____

_____

II.24. Üretim programlamasının özellikleri

Program Süresi	Öncelik Kuralı	Hangi Amaca göre Programlandığı
☐ Günlük	☐ FCFS	☐ Belirli bir süre içinde mümkün olduğu kadar çok sayıda iş bitirmek
☐ Haftalık	☐ SPT	
☐ İki Haftalık	☐ S/OPN	☐ Üretimde süreklilik ve düzgünlük sağlamak
☐ Aylık	☐ DD	
☐ İki Aylık	☐ Sağduyu ve tecrübe	☐ Ara-stok düzeyini mümkün olduğu kadar düşük tutmak
☐ Mevsimlik	☐ Diğer	☐ Siparişleri mümkün olduğu kadar teslim süreleri içinde bitirmek
☐ Altı Aylık		
☐ Yıllık		Diğer (Açıklanacak)
☐ Diğer (Açıklanacak)		_____
_____		_____
_____		_____

II.25. Üretim programlanmasında bilgisayar kullanımı :

☐ Evet   ☐ Kısmen   ☐ Kullanılmıyor

.S.K.B.

II.26. Kalite Kontrol Görevlileri ve Özellikleri

GÖREVİ	MESLEĞİ	EĞİTİM GÖRDÜĞÜ KURULUŞ	KALİTE KONTROL TECRÜBESİ (YIL)	YABANCI DİL BİLGİSİ

II.27. Kalite Kontrol Laboratuvar ve Aletleri

Laboratuvar alanı _____ m^2

Kalite Kontrol Aletleri	Modeli (Yılı)	Sayısı
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		

Eldeki kalite kontrol cihaz ve aletlerinin bugünkü fiyatlarla
değeri _____ T.L.

II.28. Kalite Kontrol Bölümünün yıllık bütçesi

_____ T.L.

II.29. Ürünlerinizi hangi kalite standartlarına göre
yapıyorsunuz? (TSE, ASA, vb.)

1. _____

2. _____

3. _____

4. _____

II.30. Kalite kontrolunun yapıldığı üretim aşamaları ve
örnekleme yöntemi ve örnek büyüklüğü

Üretim Aşaması	Örnekleme Yöntemi	Örnek Büyüklüğü
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

II.31. Uygulanan kalite kontrol yöntemleri (istatistiksel veya benzerleri)

1. _____

2. _____

3. _____

4. _____

5. _____

II.32. Kalite Kontrol Bölümünün yetkileri

☐ Üretim süreci boyunca bir üniteden ötekine her geçişte (fabrika içinde malzeme akışı) KKB onayı gerekir. Onaylanmadığı takdirde, malzeme fire olarak muamele görür veya yeniden üzerinde çalışılmak üzere geri gönderilir.

☐ Yalnızca belirli bazı ünitelerden çıkan ürünlerin öteki ünitelere devamı için KKB onayı gerekir. Onaylanmadığında, malzeme fire olarak muamele görür veya üzerinde yeniden çalışılır.

☐ Yalnızca, dışarıdan alınan malzemenin kabul edilip edilmemesinde tam yetki KKB'dedir.

☐ Yalnızca, nihaî ürünün kalitesini belirlemekle yetkilidir. Kalitesini onaylamadığı ürün piyasaya kesinlikle sürülmez.

☐ Kaliteyi bozucu unsurları (işçi, makina vb) üretimde devre dışı bırakabilir.

☐ Kalite kontrol düzen ve yönteminin belirlenmesi ve uygulanması yetkisi yalnızca KKB'ye verilmiştir.

II.32. (Devamı)

☐ Kalite kontrol düzen ve yönteminin belirlenmesi
ve uygulanması sürecinde KKB devrededir, görüş
ve onayı gerekir.

☐ KKB, belirlenen kalite kontrol düzen ve yönteminin
yalnızca uygulanmasından sorumludur ve bu görevin
gerektirdiği yetkilerle donatılmıştır.

☐ KKB, üretim süreci içinde akan malzemenin kalite
kontrol ölçmelerini yapar ve sonuçları bilgi olarak
ilgili ünitelere ulaştırır.

☐ Diğer (Açıklayınız) _____

_____

_____

_____

_____

_____

_____

II.33. Uyguladığınız kalite kontrol düzeni ve yöntemine göre, tüm
imalatınızın yüzde kaçı "kalite dışı" olarak sınıflandırılıyor?

Üretim Aşaması	Kalite Dışı Yüzdesi
1.Dışardan alınan malzeme _____	_____
2._____	_____
3._____	_____
4._____	_____
5._____	_____
6._____	_____
7._____	_____
8._____	_____

II.34. Yerli ve dış yabancı rakip firmalarla karşılaştırdığınızda kendi
ürünlerinizin kalitesini nasıl buluyorsunuz? (Sizce kalitesi en
yüksek olan yerli ve dış yabancı firmalara 100 vererek kendi
durumunuzu değerlendiriniz)

Yerli rakip firmaya göre   : _____

Dış yabancı rakip firmaya göre : _____

II.35. Kalitenizdeki farklılığın hangi faktörlerden dolayı
ileri geldiğini öncelik sırasına göre belirtiniz.

1. İşçilik düzeyinin yetersizliği _____ ☐

2. Makina ve teçhizatın eski ve yıpranmış
olması _____ ☐

3. Bakım ve onarımın yetersizliği _____ ☐

4. Hammadde kalitesinin düşüklüğü _____ ☐

5. Yansanayi girdisi kalite düşüklüğü _____ ☐

6. Firmadaki kalite kontrol kadrosunun
eksikliği veya yetersizliği _____ ☐

7. Faaliyet gösterilen pazarlarda kalite
faktörünün çok önemli olmayışı _____ ☐

8. Kalite kontrol fonksiyonun firmaca
benimsenmeyişi _____ ☐

9. Hammadde, yarı mamul ve mamul depolama
sisteminin yetersizliği ve bunun sonucu
olarak kalitenin olumsuz yönde etkilenmesi _____ ☐

10. Diğer (Açıklayınız) _____ ☐

_____

_____

_____

_____

_____

_____

II.36. Faaliyet gösterdiğiniz pazarlarda sözkonusu mamullerin
kalitesi, rekabet gücünü ne ölçüde etkilemektedir?

```
┌──────────┐   Hiç etkilemez
│    1      │
├──────────┤   Biraz etkiler
│    2      │
├──────────┤   Etkiler
│    3      │
├──────────┤   Çok etkiler
│    4      │
├──────────┤   Son derecede çok etkiler
│    5      │
└──────────┘
```

II.37. Kalitenin yükselmesi için ne gibi stratejik tedbirler
aldınız veya almaktasınız?

☐ Firmada kalite kontrolunun önemini vurgulayan
Seminerlerin düzenlenmesi veya düzenlenen seminer-
lere eleman gönderilmesi,

☐ Kalite kontrol fonksiyonu ile ilgili personelin
bu konuda geliştirilmesi için özel eğitim prog-
ramlarının hazırlanıp uygulanması,

☐ Kalite kontrol personelinin özel eğitim için
yurtdışına gönderilmesi

☐ Daha iyi cihaz ve aletlerin alınarak kalite
kontrolunda kullanılması,

☐ Daha yüksek kaliteli mal üreten teknolojiye
doğru gidilmesi,

%

II.37. (Devam)

☐ Kalite kontrol kadrosunun genişletilmesi,

☐ KKB'nin yetkilerinin arttırılması,

☐ Diğer (Açıklayınız) _____

_____

_____

_____

_____

II.38. Kalite kontrol konusunda işbirliğine gittiğiniz veya
       hizmetini kullandığınız kuruluşlar

Kuruluş Türü	Yıllar
☐ Üniversite/Akademik kuruluşlar _____	
☐ Araştırma Laboratuvar veya Enstitü _____	
☐ KİT _____	
☐ Özel sektör sınaî firma _____	
☐ Yabancı firma/kuruluş _____	
☐ Diğer (Açıklayınız) _____	

II.39. Bakım ve onarım işlerini yürüten bir işletme
       atelyeniz var mı?

☐ Evet   ☐ Hayır   ☐ Başka firmalardan
                                servis alıyoruz.

II.40. İşletme atelyenizin kadrosu nedir?

> Mühendis sayısı _____
>
> Teknisyen sayısı _____
>
> Ustabaşı sayısı _____
>
> İşçi sayısı _____
>
> Diğer _____
>
>
>
> Toplam _____

I.41. İşletme atelyenizin bakım-onarım dışında yürüttüğü
     işler nelerdir?

☐ Bakım-onarım dışında iş yapmaz

☐ Gereken bazı kalıpları yapar

☐ Gereken bütün kalıpları yapar

☐ Makinalar üzerinde değişiklik, yenilik
   uyarlama çalışmaları yapar

☐ Makina ve teçhizat yapar

☐ Yeni ve daha iyi makina ve teçhizat geliştirir

☐ A+ G Bölümünün istediği işleri yapar

☐ Başka firmalara servis verir

☐ Diğer _____

_____

II.42. Bakım-onarımda temel yaklaşımınız nedir?

☐ Önleyici/koruyucu bakım-onarım

☐ Bozuldukça bakım-onarım

☐ Diğer (Açıklayınız) _____

_____

_____

_____

II.43. Üretimin çeşitli safhalarında iş ve zaman
etüdü yapılıp standartlar tesbit ediliyor mu?

☐ Evet   ☐ Kısmen   ☐ Hayır

II.44. İş ve zaman etüdleri sonunda bulunan standartlar hangi
amaçlara yönelik kullanılıyor?

☐ İşçi verimini kontrol

☐ İşçi ücretini tesbit

☐ İşçi primini tesbit

☐ Kapasiteler tesbiti

☐ Birim maliyeti tesbit

☐ Üretimde darboğazları tesbit

☐ Diğer (Açıklayınız) _____

_____

_____

_____

II.45. Maliyet muhasebesi sisteminiz var mıdır?

☐ Evet   ☐ Kısmen   ☐ Hayır

II.46. Maliyet muhasebesi sisteminizde bilgisayar kullanımı
       oranı nedir?

1	Bilgisayar hiç kullanılmaz
2	
3	
4	
5	Herşey bilgisayarla yapılır

II.47. Hangi maliyet muhasebesi sistemini kullanıyorsunuz?

☐ sipariş maliyet sistemi

☐ safha maliyet sistemi

☐ standart maliyet sistemi

☐ direkt maliyet sistemi

☐ birleşik ve tali imalat maliyet sistemi

☐ diğer (açıklayınız) _____

_____

_____

_____

_____

II.48. Maliyet muhasebesini hangi amaçlarla ne ölçüde
kullanıyorsunuz ?

Kullanılma amacı	Kullanılma Yoğunluğu
☐ Fiat tesbitinde	
☐ Mamullerin veya mamul gruplarının kârlılıklarının hesaplanmasında	
☐ Stokların değerlendirilmesinde	
☐ Hukukî ihtilaflarda, kredi isteklerinde, toplu sözleşme görüşmelerinde kullanılmak üzere	
☐ Maliyet masrafları türlerinin zaman içinde izlenmesi ve denetimi	
☐ Üretim yönteminin seçiminde kullanılmak üzere maliyet masraf türlerinin, mamul ve safhalara göre tesbitinde	
☐ Resmi makamların getirdiği yasal yükümlülüklere uymak için	
☐ Plan, Program ve bütçe hazırlanmasında	
☐ Diğer (Açıklayınız)	

II.49. Eğitim ve tecrübe durumlarına göre işçi sayısı
dağılımını aşağıdaki tabloda veriniz.

Eğitim Düzeyi	Tecrübe (Yıl)			
	0-2	2-5	5-10	10 +
İlköğretim	10			
Ortaöğretim				
Yükseköğretim				

II.50. Üretim tesislerinizdeki makina, teçhizat ve teknolojinin
tam anlamıyla kullanılabilmesi açısından elinizdeki
işçilik düzeyini değerlendiriniz.

1	Çok yetersiz
2	Yetersiz
3	Vasat
4	Yeterli
5	Çok yeterli

I.51. İşçilik verimini ölçmede kullandığınız birim nedir?

İşçilik verimliliğini ölçme birimi _____

_____

_____

_____

_____

I.52. Kullandığınız işçilik verimliliği ölçüm birimlerine
göre aşağıdaki tabloyu doldurunuz.

Birim	Sizdeki Verimlilik	Türk Rakip Firmadaki Verimlilik	Yabancı Rakip Firmadaki Verimlilik

.53. Üretimde işçilik verimini arttırmak amacı ile eğitim programları
uyguladınız mı?

☐ Son yıllarda düzenli ve sürekli olarak

☐ Son yıllarda zaman zaman

☐ Son yıllarda hayır

☐ Diğer _____

II.54. Son yıllarda uygulanan işçi eğitim programlarının konuların
ve sıklıklarını aşağıdaki tabloda belirtiniz.

Konu	Yoğunluğu
☐ İş kazasından korunma	
☐ Makina ve teçhizatı daha iyi kullanma	
☐ Kalite kontrolu	
☐ Bakım ve onarım	
☐ Fabrikada malzeme akışı	
☐ Diğer (Açıklayınız)	

II.55. Uyguladığınız işçi eğitim programlarının istediğiniz veya
beklediğiniz düzeyde olumlu etkilerini ne kadar süre
sonra görüyorsunuz ?

Eğitim programı	Etkileme süresi
1.	
2.	
3.	
4.	
5.	
6.	

II.56. İşe almada adaylara nasıl bir yöntem uyguluyorsunuz?
Uygulama yoğunluğuna göre belirtiniz.

Yöntem	Uygulama Yoğunluğu
☐ Şu anda çalışanların tanıdıklarını görüşme yaptıktan sonda işe almak	
☐ Adayları bir imtihandan (pratik, sözlü,yazılı,vb) geçirdikten sonra başarılı olanları işe almak	
☐ Adayları iş öncesi pratik ve teorik bir eğitim programından geçirdikten sonra başarılı olanları işe almak	
☐ Benzer öteki sınaî kuruluşlardaki işçileri yakından izleyerek uygun nitelikte olanları işe almak	
☐ Adayları başvuru tarihlerine veya sıralarına göre işe almak	
☐ Diğer (Açıklayınız)	

II.57. İşe almada işçi adaylarını değerlendirirken kullandığınız
kriterleri önem sırasına göre belirtiniz.

Kullanılan Kriter	Önem Derecesi
☐ Yıl olarak sektördeki tecrübesi	
☐ Eğitim düzeyi	
☐ Kendisi hakkında verilen referanslar	
☐ Eğitim programı veya imtihandaki başarısı	
☐ Genel kültür ve ahlâk durumu	
☐ Diğer (Açıklayınız)	

II.58. İşe aldığınız işçiler ortalama olarak ne kadar bir süre
sonra istediğiniz veya beklediğiniz düzeye erişebiliyorlar?

_____ bir süreden sonra

	GÖREVİ	MESLEĞİ	EĞİTİM GÖRDÜĞÜ KURULUŞ	PAZARLAMA VE SATIŞ TECRÜBEBİ (Yıl)	YABANCI DİL BİLGİSİ
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					

II.60. İç ve dış pazarlardaki faaliyetlerin yoğunluğunu aşağıdaki
tabloda belirtiniz.

Faaliyet türü	Harcamalar
☐ İç seyahatlar _____	
☐ Dış seyahatlar _____	
☐ İç pazarlar için reklam/tanıtma _____	
☐ Dış pazarlar için reklam/tanıtma _____	
☐ Telefon,telex,telgraf,posta vb. _____	
☐ Diğer (Açıklayınız) _____	
Toplam _____	

II.61. İç ve dış pazarlardaki rakiplerinizi nasıl izliyorsunuz?
Öncelik sıranıza göre belirtiniz.

İzleme biçimi	Önceliği
☐ Sınaî sergiler ve fuarlar _____	
☐ Müşteriler vasıtasıyla _____	
☐ İhracatçı firmalar yoluyla _____	
☐ Uluslararası ticaret kuruluşlarıyla _____	
☐ Devlet kuruluşları kanalıyla _____	
☐ Diğer (Açıklayınız) _____	

II.62. Sizin iç ve dış pazarlardaki faaliyetleriniz başlatıldıktan nekadar süre sonra olumlu etkisi görülmeye başlıyor?

İç pazarlarda _____ . süreden sonra

Dış pazarlarda _____ süreden sonra

Avrupa pazarlarında _____

Ortadoğu ve Afrika pazarlarında _____

Sosyalist ülke pazarlarında _____

Diğer _____

BÖLÜM III : TEKNOLOJİ, KAPASİTE, ARAŞTIRMA

III.1. Tesislerinizdeki ana üretim makina-teçhizatın özelliklerini aşağıdaki tabloya göre belirtiniz.

Makina-Teçhizat Türü	Sayısı	Kapasitesi	Menşei	Yaşı (Yıl)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				

III.2. Tesislerinizde kullanılan üretim teknolojisinin oluşum biçimi
ve yüzdeleri nedir?

Teknoloji Oluşum Yolu	Yüzdesi
☐ İthal edilen makina-teçhizatla _____	
☐ Firma içinde A+G faaliyetleri ile _____	
☐ Yerli firma ve A+G kuruluşları ile _____	
☐ Mühendis,teknik eleman transferleri ile _____	
☐ Dış firmaların teknik yardımları ile _____	
☐ Teknik lisans anlaşmaları ile _____	
☐ Diğer (Açıklayınız) _____	
_____	
_____	
_____	
_____	
	100

III.3. Şu anda kullandığınız üretim teknolojisinden ne ölçüde
tatmin oluyorsunuz?

1	Çok yetersiz ve ilkel
2	Yetersiz
3	Vasat
4	Yeterli
5	Çok yeterli ve ileri

III.4. Şu anda kullandığınız üretim teknolojisini rakip firmalarınkiyle karşılaştırdığınızda hangi düzeyde buluyorsunuz?

(En iyi durumda olan iç rakip firma= 100,

En iyi durumda olan dış rakip firma= 100 olarak değerlendirilecek)

En iyi iç rakip firmanınkine kıyasla _____

En iyi dış rakip firmanınkine kıyasla _____

III.5. Şu anda kullandığınız üretim teknolojisinin üstün ve geri olan yönlerini önem sırasına göre belirtiniz.

ÜSTÜN YÖNÜ	ÖNEMİ	GERİ YÖNÜ	ÖNEMİ
☐ Ucuz teknoloji ___	___	☐ Pahalı teknoloji ___	___
☐ Daha fazla miktarda ve kalite mal üretebilme ___	___	☐ Daha az miktarda ve kalite mal üretebilme ___	___
☐ Daha az enerji ___	___	☐ Daha fazla enerji ___	___
☐ Daha üst düzeyde otomasyon ___	___	☐ Daha alt düzeyde otomasyan ___	___
☐ Yurt içinde üretilen girdileri daha çok kullanıyor ___	___	☐ Üretim girdilerinin çoğunluğu ithalatı gerektiriyor ___	___
☐ Teknolojik ilerlemeleri hem aktarabilme olanağı var ___	___	☐ Teknolojik ilerlemeleri aktarabilme olasılığı zayıf ___	___
☐ Firmanın teknik ve işçilik düzeyini arttırıcı nitelikte ___	___	☐ Firmanın teknik ve işçilik düzeyi ile bağdaşmımıyor ___	___
☐ Diğer (Açıklayınız) ___	___	☐ Diğer (Açıklayınız) ___	___
___	___	___	___
___	___	___	___

III.6. Aşağıdaki listede verilen ülkelerin teknolojik düzeylerini içinde
faaliyet gösterdiğiniz sektör açısından değerlendiriniz.
(En yüksek teknolojiye sahip ülke= 100)

Ülke	Teknolojik Düzeyi	Ülke	Teknolojik Düzeyi
1. ABD	_____	11. İSVİÇRE	_____
2. BATI ALMANYA	_____	12. İTALYA	_____
3. BREZİLYA	_____	13. JAPONYA	_____
4. BULGARİSTAN	_____	14. MACARİSTAN	_____
5. ÇEKOSLOVAKYA	_____	15. PORTEKİZ	_____
6. FRANSA	_____	16. ROMANYA	_____
7. GÜNEY KORE	_____	17. S.S.C.B.	_____
8. HONG-KONG	_____	18. TAİWAN	_____
9. İNGİLTERE	_____	19. TÜRKİYE	_____
10. İSRAİL	_____	20. YUNANİSTAN	_____

III.7. Dünyadaki teknolojik ilerlemeleri nasıl izliyorsunuz?

İzleme Biçimi	Etkinliği
☐ Teknik lisans anlaşması yapılan firma yoluyla	_____
☐ Dış ülkelerdeki fabrikaları gezerek incelemekle	_____
☐ Dış ülkelerdeki sınaî fuar ve sergilere katılma	_____
☐ Firmadaki A+G faaliyetleriyle	_____
☐ Bilimsel ve teknolojik yayınları izlemekle	_____
☐ Diğer (Açıklayınız)	_____

III.B. Kullandığınız teknolojinin seçiminde etkin olan faktörleri,
       oynadıkları rolün önemine göre belirtiniz.

Faktör	Önemi
☐ Teknolojinin maliyeti _____	_____
☐ Teknolojinin getirdiği kalite ve miktar artışı _____	_____
☐ Kendisinden teknoloji alınan yabancı firmanın bu alandaki tecrübesi, teknik bilgisi ve şöhreti _____	_____
☐ Kendisinden teknoloji alınan yabancı firmanın bu alandaki teknoloji üretme ve geliştirme yeteneği, olasılığı ve potansiyeli_____	_____
☐ Teknolojinin dünyanın daha birçok ülkelerinde başarı ile kullanılıyor olması _____	_____
☐ Kendisinden teknoloji alınan yabancı firmanın kredi vermesi veya kredi sağlanmasında aracı ve neden olması _____	_____
☐ İşçilik ve üretim girdileri açısından Türkiye koşullarına daha uygun olması _____	_____
☐ Diğer (Açıklayınız) _____	
_____	
_____	
_____	
_____	

III.9. Şu andaki teknolojinizi daha da iyi kullanabilmek için ne gibi
tedbirlerin alınması gerekir? Önem sırasına göre belirtiniz.

Tedbirler	Önemi
☐ İşçilerin eğitilmesi _____	_____
☐ Mühendis-teknisyen kadrosunun eğitim ve görgüsünün arttırılması_____	_____
☐ Firma içinde A+G faaliyetlerinin arttırılması _____	_____
☐ Dış firmalardan teknik servis ve yardım alınması _____	_____
☐ Diğer (Açıklayınız) _____	
_____	
_____	
_____	

III.10. Üretim teknolojinizi çok daha ileri düzeye ulaştırmak için nasıl
bir yaklaşımı firmanıza uygun görüyorsunuz?

1	Arzulanan teknolojik düzeye yalnızca firmadaki A+G faaliyetleri ile erişmek uygundur.
2	
3	
4	
5	Arzulanan teknolojik düzeye yalnızca dış yabancı firmalardan alınacak teknojilerle erişmek uygundur. (Herşey anahtar teslimi)

III.11. Sizi, arzuladığınız düzeye ulaştırabilecek teknoloji, alınmasından veya gerçekleştirilmesinden ne kadar bir süre sonra tam anlamıyla üretimde kullanılabilir duruma gelebilir?

Ortalama _____ bir süreden sonra

En az   _____ bir süreden sonra

En fazla _____ bir süreden sonra

III.12. Arzuladığınız ve uygun gördüğünüz teknolojik düzeye erişebilmek için ne gibi orta ve uzun vadeli tedbirler aldınız veya almaktasınız? Önem sırasına göre belirtiniz.

Tedbir	Önemi
☐ Firma içinde A+G kadrosu ve faaliyetlerinin arttırılması _____	____
☐ Daha ileri teknolojiye sahip fabrikalarda incelemelerin düzenlenmesi ve uygulanması	____
☐ Teknolojik farkın giderilmesi için teknik lisans anlaşmalarına gidilmesi_____	____
☐ Teknik personelin teknolojisi ileri olan ülkelerde eğitilmesi ve yetiştirilmesi	____
☐ Makina ve teçhizatın modernizasyonu	____
☐ Diğer (Açıklayınız) _____	
_____	
_____	
_____	

III.13. Uyguladığınız çalışma zamanı düzeniniz nedir?

Üretim Bölümü	Haftada Çalışılan Gün Sayısı	Günde Vardiye Sayısı	Vardiye Başına Çalışılan Saat
1.			
2.			
3.			
4.			
5.			
6.			

III.14. "İdeal (Teorik)" ve "Gerçekleştirilebilir Kapasite" açısından uygulanması uygun görülen çalışma zamanı düzeniniz nedir?

Üretim Bölümü	Haftada Çalışılan Gün Sayısı	Günde Vardiye Sayısı	Vardiye Başına Çalışılan Saat
1.			
2.			
3.			
4.			
5.			
6.			

III.15. İdeal koşullar (şu andaki makina-teçhizat sıfır yaşta; üstün
vasıflı işçi, teknisyen işçi, teknisyen, mühendis, ve yönetici
mevcut; enerji kısıtlamaları veya kesilmeleri gibi altyapı
sorunları yok, v.s.) altında sağlanabilecek TEORİK KAPASİTENİZ
nedir? (Görüşme sırasında ayrıntılı açıklama yapılacak ve
cevabın Soru III.14'e göre verilmesi istenecek).

Bilirkişi	Birim	Teorik Kapasite
1.		
2.		
3.		
4.		
5.		

III.16. Bugünkü koşullar (şu andaki makina-teçhizatın durumu; eldeki
işçilik ve mühendislik düseyi; eldeki yönetim düzeyi) altında
sağlanabilecek GERÇEKLEŞTİRİLEBİLİR KAPASİTENİZ nedir?
(Görüşme sırasında ayrıntılı açıklama yapılacak ve cevap
Soru III.14'e göre istenecek).

Bilirkişi	Birim	Gerçekleştirilebilir Kapasite
1.		
2.		
3.		
4.		
5.		

III.17. Son yıllarda gerçekleştirdiğiniz üretimi aşağıdaki
tabloda belirtiniz.

Mamul Türü	Birim	Üretim			
		1978	1979	1980	1981
1. _____	___	___	___	___	___
2. _____	___	___	___	___	___
3. _____	___	___	___	___	___
4. _____	___	___	___	___	___
5. _____	___	___	___	___	___
6. _____	___	___	___	___	___
Kullanılan kapasite					

III.18. Elektrik kısıtlamaları ve kesilmeleri, nakliyat gecikmeleri
altyapı sorunları son yıllarda ne kadar üretim kaybına neden
oldu? (Gerçekleştirilen üretimlerin yüzdesi olarak verilecek)

Bilirkişi	Üretim Kaybı Yüzdesi			
	1978	1979	1980	1981
1. _____	___	___	___	___
2. _____	___	___	___	___
3. _____	___	___	___	___
4. _____	___	___	___	___
5. _____	___	___	___	___

III.19. Kullanılan kapasitenin, TEORİK KAPASİTE'ye erişememesinin
nedenlerini önem sırasına göre belirtiniz.

Neden veya Engel	Önemi
☐ Makina-teçhizat yaş ortalamasının yüksek oluşu ve bunun sonucu olarak üretimde sık ve uzun duraklamalar _____	_____
☐ Kalite standartlarına uymayan malzeme kullanma zorunluğu _____	_____
☐ Yeterince ve zamanında malzeme temin edilememesi _____	_____
☐ İşçilik düzeyinin yetersiz oluşu _____	_____
☐ Teknik-mühendislik düzeyinin yetersiz oluşu _____	_____
☐ Sevk ve İdare kadrosunun yetersiz oluşu _____	_____
☐ İşletme sermayesi yetersizliği ve finansal zorluklar _____	_____
☐ Faaliyet gösterilen pazarlarda talebin azalması veya başka ürünlere yönelmesi _____	_____
☐ Enerji kısıtlamaları ve kesilmeleri, nakliyat aksamaları gibi altyapı sorunları _____	_____
☐ Diğer (Açıklayınız) _____	_____
_____	_____
_____	_____

III.20. Araştırma ve Geliştirme kadronuzu ve özelliklerini aşağıdaki tabloda belirtiniz.

	GÖREVİ	A+G %	MESLEĞİ	EĞİTİM GÖRDÜĞÜ KURULUŞLAR	ALDIĞI DİPLOMALAR	A+G TECRÜBESİ (YIL)	YABANCI DİL BİLGİSİ
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							
16.							
17.							
18.							
19.							
20.							
21.							
22.							
23.							

II.21. Son üç yıla ilişkin A+G Bütçenizi ve ana kalemlerini aşağıdaki tabloda belirtiniz.

Ana Kalem	Tutarı		
	1979	1980	1981
Personel			
Araç + Alet vs.			
Malzeme			
Diğer			
Yıllık Toplam A+G Bütçesi			
A+G Bütçesinin Toplam Satışlara Olan Yüzdesi			

II.22. Son yıllarda sürdürdüğünüz A+G faaliyetlerinizin alanları nelerdir?

A+G Faaliyet Alanı	Yoğunluğu
▢ Mamul geliştirmesi	
▢ Malzeme geliştirmesi	
▢ Proses geliştirmesi	
▢ Makina-teçhizat geliştirmesi	
▢ Yabancı teknolojinin adaptasyonu	
▢ Sevk ve idare yöntemlerinin geliştirilmesi	
▢ Diğer (Açıklayınız)	

III. Son üç yılda sürdürdüğünüz A+G faaliyetlerinizin getirdiği sonuçları belirtiniz.

Gerçekleştirilen Olumlu Sonuç	Yüzdesi
☐ Yeni mamul sayısında artış yüzdesi _____	_____
☐ Mamullerde kalite artış yüzdesi _____	_____
☐ Malzemelerde kalite artış yüzdesi _____	_____
☐ Üretim miktarlarında artış yüzdesi _____	_____
☐ Teslim veya üretim sürelerinde kısalış yüzdesi _____	_____
☐ Malzeme kullanışında tasarruf yüzdesi _____	_____
☐ Enerji kullanımında tasarruf yüzdesi _____	_____
☐ Birim maliyette düşüş yüzdesi _____	_____
☐ Diğer (Açıklayınız) _____	_____
_____	_____
_____	_____

III.24. Son üç yıl içinde sürdürdüğünüz A+G faaliyetleri sayesinde gerçekleştirdiğiniz teknolojik ve kapasite gelişmeleri nedir?

Bilirkişi	Teknoloji	Kapasite
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

BÖLÜM IV. PAZARLAR, RAKİPLER, SATIŞLAR

IV.1. Son üç yıl içinde iç pazarlarda gerçekleştirdiğiniz satışları
aşağıdaki tabloda gösteriniz.

	1979		1980		1981	
	Tutarı	%	Tutarı	%	Tutarı	%
1. Özel Sektöre	___	___	___	___	___	___
2. Kamu kesimine	___	___	___	___	___	___
Toplam İç Pazar		100		100		100

IV.2. Son üç yıl içinde dış pazarlarda gerçekleştirdiğiniz satışları
aşağıdaki tabloda gösteriniz.

Ülke	1979		1980		1981	
	Tutarı	%	Tutarı	%	Tutarı	%
1. ___	___	___	___	___	___	___
2. ___	___	___	___	___	___	___
3. ___	___	___	___	___	___	___
4. ___	___	___	___	___	___	___
5. ___	___	___	___	___	___	___
6. ___	___	___	___	___	___	___
7. ___	___	___	___	___	___	___
8. ___	___	___	___	___	___	___
9. ___	___	___	___	___	___	___
10. ___	___	___	___	___	___	___
11. ___	___	___	___	___	___	___
12. ___	___	___	___	___	___	___
Toplam İhracat		100		100		100

IV.3. Kalite,fiyat,miktar ve teslim süresi açısından kendinizi en iyi yerli
ve yabancı firmalarla kıyaslayıp değerlendiriniz. (En iyi yerli rakip
firma=100,En iyi yabancı rakip firma=100)

Kıyaslama Ölçütü	Yerli Firmaya Göre	Yabancı Firmaya Göre
1. Kalite _____	_____	_____
2. Fiyat _____	_____	_____
3. Miktar _____	_____	_____
4. Teslim süresi _____	_____	_____

IV.4. İç ve dış pazarlarda rekabet gücünü tanımlayan ve belirleyen
faktörleri önem derecesine göre veriniz.

Faktör	Bilirkişi I		Bilişkişi 2		Bilirkişi 3	
	İç Pazar	Dış Pazar	İç Pazar	Dış Pazar	İç Pazar	Dış Pazar
1. Fiyat _____						
2. Kalite _____						
3. Design/Şekil _____						
4. Anbalaj _____						
5. Miktar _____						
6. Teslim süresi_____						
7. Pazarlama Becerisi _____						
8. Mali Güç _____						
9. Nakliyet İmkânları _____						
10. Haberleşme İmkânları _____						
11. Bankacılık Düzeyi _____						
12. İhracat Kredileri _____						
13. Bürokrasi _____						
14. Ülkeler Arası İlişkiler _____						
15. _____						

IV.5. Neden ihracat yapıyorsunuz? Önem sırasına göre belirtiniz.

İhracat Nedeni	Önemi
☐ Üretim kapasitesi içpazar talebinin üzerinde ___	___
☐ Üretim girdilerinin gerektirdiği döviz ihtiyacını bir ölçüde karşılamak için ___	___
☐ Tasarlanan yatırımların gerektirdiği döviz ihtiyacını bir ölçüde karşılamak için ___	___
☐ Dış pazarlarda daha iyi fiyatlarla çalışılabiliyor ___	___
☐ Vergi iadesinden yararlanmak için ___	___
☐ Daha ucuz kredi kullanabilmek için ___	___
☐ AET'ye giriş hazırlığının bir stratejisi olarak ___	___
☐ Tesisin temelde ihracata yönelik kurulmuş olması ___	___
☐ Diğer (Açıklayınız) ___	___
___	
___	
___	
___	

IV.6. Son üç yılda gerçekleştirdiğiniz ihracatın yüzde kaçı
"ihracat kredileri" ve vergi iadeleri sayesinde olmuştur.

1979	1980	1981

IV.7. Son üç yıl içinde kullandığınız ihracat kredilerini ve ortalama
      vadelerini aşağıdaki tabloda belirtiniz.

	1 9 7 9	1 9 8 0	1 9 8 1
1. Kullanılan ihracat kredi sayısı			
2. Kullanılan ihracat kredileri toplamı			
3. Kullanılan ihracat kredilerinin ortalama vadesi			
4. Kullanılan ihracat kredilerinin ortalama yıllık faizi			

IV.8. Dış pazarlarda tutunabilmek için gereken süreler ne kadardır?

Dış pazar ülke	Gereken Ortalama Süre
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

IV.9. İhracat faaliyetleri sırasında karşılaştığınız güçlükleri ve önem
       derecelerini belirtiniz. Sözkonusu güçlükleri gidermek için ne
       ölçüde ilerleme, gelişme, düzelme olması gerekir.
       (Bugünkü durum=1)

Güçlükler	Önemi	Düzelme katsayısı
☐ Telefon-telex yetersizliğinden kaynaklanan haberleşme zorluğu _____		
☐ Malları dış pazarlara ulaştırmada karşılaşılan nakliyat yetersizliği _____		
☐ Yükleme sonrası ihracat kredisi yetersizliği _____		
☐ Banka ve sigorta servislerinin yetersizliği _____		
☐ İhracata ilişkin bürokratik işlemlerin çokluğu _____		
☐ Yabancı ülkelerde Türkiye temsilciliklerinin yetersizliği _____		
☐ Dış pazar ülkeleri ile hükümet düzeyinde ilişki ve işbirliğinin yetersizliği _____		
☐ Diğer (Açıklayınız) _____		
_____		
_____		
_____		
_____		

IV.10. İhracat YAPMIYORSANIZ, nedenlerini önem sırasına göre belirtiniz.

İhracat yapmayış nedeni	Önemi
☐ İç pazar daha cazip _____	_____
☐ Dış pazarlar için kalite düşük_____	_____
☐ Dış pazarların gerektirdiği miktarda üretim kapasitesi yok _____	_____
☐ Dış pazarlama işlerini yürütecek kadronun oluşmaması _____	_____
☐ Türkiye'ye özel mamuller üretilmesi_____	_____
☐ Diğer (Açıklayınız) _____	
_____	
_____	
_____	
_____	

BÖLÜM V : MALİ GÜÇ

V.1. Sektörünüzde faaliyet gösteren bir sınaî firmanın mali gücünü
değerlendirirken hangi kriterler hangi ağırlıklarla kullanılmalıdır
ve "mali gücü iye" olan bir firma için bu değerler ne olmalıdır?

Mali Gücü Değerlendirme Kriteri	Ağırlığı	İyi Değer	Firma
☐ Cari Oran _____	___	___	___
☐ Likidite Oranı _____	___	___	___
☐ Alacak Devir Hızı= Kredili Satışlar/ Ticari Alacaklar _____	___	___	___
☐ Stok Devir Hızı=Satılan Malın Mali- yeti/Ortalama Stok Seviyesi Değeri	___	___	___
☐ Özsermaye Devir Hızı=Net Satış/ Ortalama Özsermaye	___	___	___
☐ Aktif Devir Hızı=Net Satış/ Aktif Topl. _____	___	___	___
☐ Borçlar/Özsermaye_____	___	___	___
☐ Borçlar/Aktif Toplamı_____	___	___	___
☐ Kısa Vadeli Borçlar/Aktif Toplamı	___	___	___
☐ Kâr/Özsermaye _____	___	___	___
☐ (Net Kâr+Faizler+Vergi)/(Borçlar+ Özsermaye) _____	___	___	___
☐ Vergiden Önceki Kâr/Net Satış___	___	___	___
_____			
_____			
_____			

APPENDIX   II

THE RESULTS OF THE SCENARIOS

Scenario I

"Contribution of General
Efficiency to Competitive Potential"

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.50	.85	.79	1.05	.75
2	1.55	1.32	.41	.85	.64	1.12	.57
3	2.40	1.28	.58	.85	1.39	1.09	1.28
4	1.25	1.49	.80	.85	1.00	1.27	.78
5	1.95	.96	.87	.85	1.69	.81	2.08
6	1.51	1.29	.78	.85	1.18	1.09	1.08
7	1.24	1.54	.80	.85	.99	1.31	.76
8	1.96	.97	.91	.85	1.78	.82	2.16
9	1.69	1.25	.83	.85	1.40	1.07	1.31
10	1.77	1.17	.70	.85	1.24	1.00	1.24
11	2.50	1.10	.54	.85	1.35	.94	1.44
12	1.54	1.26	.82	.85	1.27	1.07	1.18
MEAN	1.75	1.27	.71	.85	1.23	1.05	

TABLE I - A

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.50	.95	.79	1.18	.67
2	1.55	1.32	.41	.95	.64	1.25	.51
3	2.40	1.28	.58	.95	1.39	1.22	1.15
4	1.25	1.49	.80	.95	1.00	1.42	.70
5	1.95	.96	.87	.95	1.69	.91	1.86
6	1.51	1.29	.78	.95	1.18	1.22	.96
7	1.24	1.54	.80	.95	.99	1.47	.68
8	1.96	.97	.91	.95	1.78	..92	1.94
9	1.69	1.25	.83	.95	1.40	1.19	1.18
10	1.77	1.17	.70	.95	1.24	1.11	1.11
11	2.50	1.10	.54	.95	1.35	1.05	1.29
12	1.54	1.26	.82	.95	1.27	1.20	1.05
MEAN	1.75	1.27	.71	.95	1.23	1.18	

TABLE I - B

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FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.85	.86	1.34	1.06	1.26
2	1.55	1.32	.48	.81	.74	1.07	.70
3	2.40	1.28	.61	.85	1.47	1.09	1.35
4	1.25	1.49	.49	.84	.61	1.25	.49
5	1.95	.96	.74	.71	1.44	.78	1.86
6	1.51	1.29	.63	.82	.95	1.06	.90
7	1.24	1.54	.59	.90	.73	1.39	.53
8	1.96	.97	.89	.85	1.74	.82	2.12
9	1.69	1.25	.72	.81	1.21	1.02	1.20
10	1.77	1.17	.58	.91	1.02	1.07	.96
11	2.50	1.10	.74	.87	1.85	.96	1.93
12	1.54	1.26	.88	.93	1.36	1.17	1.16
MEAN	1.75	1.27	.68	.86	1.21	1.06	

TABLE I – C/i

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.86	.90	1.36	1.11	1.22
2	1.55	1.32	.82	.82	1.27	1.08	1.17
3	2.40	1.28	.44	.93	1.06	1.19	.89
4	1.25	1.49	.87	.90	1.08	1.34	.81
5	1.95	.96	.75	.93	1.46	.89	1.64
6	1.51	1.29	.51	.81	.77	1.04	.74
7	1.24	1.54	.48	.86	.60	1.33	.45
8	1.96	.97	.45	.94	.88	.91	.97
9	1.69	1.25	.58	.84	.98	1.05	.93
10	1.77	1.17	.84	.91	1.48	1.07	1.39
11	2.50	1.10	.79	.90	1.97	.99	1.99
12	1.54	1.26	.54	.81	.83	1.02	.81
MEAN	1.75	1.27	.66	.88	1.15	1.09	

TABLE I - C/ii

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.55	.84	.87	1.04	.83
2	1.55	1.32	.69	.94	1.07	1.24	.86
3	2.40	1.28	.87	.83	2.09	1.06	1.97
4	1.25	1.49	.41	.86	.51	1.28	.40
5	1.95	.96	.78	.88	1.57	.84	1.80
6	1.51	1.29	.91	.94	1.38	1.21	1.14
7	1.24	1.54	.46	.94	.57	1.45	.39
8	1.96	.97	.73	.89	1.43	1.86	1.66
9	1.69	1.25	.55	.91	.93	1.14	.81
10	1.77	1.17	.59	.86	1.04	1.01	1.03
11	2.50	1.10	.85	.88	2.12	.97	2.19
12	1.54	1.26	.49	.81	.76	1.02	.74
MEAN	1.75	1.27	.66	.88	1.19	1.10	

TABLE I - C/iii

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FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.64	.81	1.01	1.00	1.01
2	1.55	1.32	.82	.80	1.27	1.06	1.20
3	2.40	1.28	.63	.94	1.51	1.20	1.26
4	1.25	1.49	.59	.85	.73	1.27	.58
5	1.95	.96	.74	.84	1.44	.80	1.79
6	1.51	1.29	.82	.89	1.24	1.15	1.08
7	1.24	1.54	.89	.89	1.11	1.37	.80
8	1.96	.97	.57	.83	1.12	.80	1.39
9	1.69	1.25	.75	.83	1.27	1.04	1.22
10	1.77	1.17	.70	.90	1.24	1.06	1.17
11	2.50	1.10	.73	.86	1.82	.95	1.93
12	1.54	1.26	.85	.88	1.31	1.11	1.18
MEAN	1.75	1.27	.73	.86	1.26	1.07	

TABLE I — C/iv

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.66	.90	1.04	1.11	.93
2	1.55	1.32	.78	.90	1.21	1.19	1.02
3	2.40	1.28	.82	.84	1.97	1.08	1.83
4	1.25	1.49	1.66	.86	.82	1.28	.64
5	1.95	.96	.51	.94	.99	.90	1.10
6	1.51	1.29	.78	.88	1.18	1.13	1.04
7	1.24	1.54	.89	.89	1.11	1.37	.80
8	1.96	.97	.60	.82	1.17	.79	1.48
9	1.69	1.25	.49	.93	.83	1.17	.71
10	1.77	1.17	.58	.89	1.02	1.04	.98
11	2.50	1.10	.58	.85	1.45	.94	1.55
12	1.54	1.26	.61	.85	.94	1.07	.88
MEAN	1.75	1.27	.66	.88	1.15	1.09	

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TABLE I – C/v

TABLE I – D/i

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.48	.90	.76	1.11	.68
2	1.55	1.32	.39	.90	.60	1.19	.51
3	2.40	1.28	.55	.90	1.32	1.15	1.15
4	1.25	1.49	.76	.90	.95	1.34	.70
5	1.95	.96	.83	.90	1.62	.86	1.87
6	1.51	1.29	.74	.90	1.12	1.16	.96
7	1.24	1.54	.76	.90	.94	1.39	.68
8	1.96	.97	.86	.90	1.68	.87	1.93
9	1.69	1.25	.79	.90	1.33	1.13	1.18
10	1.77	1.17	.67	.90	1.18	1.06	1.12
11	2.50	1.10	.51	.90	1.27	.99	1.29
12	1.54	1.26	.78	.90	1.20	1.14	1.06
MEAN	1.75	1.27	.68	.90	1.17	1.12	

TABLE I – D/ii

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.45	.90	.71	1.11	.64
2	1.55	1.32	.37	.90	.57	1.19	.48
3	2.40	1.28	.52	.90	1.25	1.15	1.08
4	1.25	1.49	.72	.90	.90	1.34	.67
5	1.95	.96	.78	.90	1.52	.86	1.76
6	1.51	1.29	.70	.90	1.06	1.16	.91
7	1.24	1.54	.72	.90	.89	1.39	.64
8	1.96	.97	.81	.90	1.59	.87	1.82
9	1.69	1.25	.75	.90	1.27	1.13	1.12
10	1.77	1.17	.63	.90	1.11	1.06	1.05
11	2.50	1.10	.49	.90	1.22	.99	1.24
12	1.54	1.26	.74	.90	1.14	1.14	1.00
MEAN	1.75	1.27	.64	.90	1.10	1.12	

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.48	.85	.76	1.05	.72
2	1.55	1.32	.39	.85	.60	1.12	.54
3	2.40	1.28	.55	.85	1.32	1.09	1.21
4	1.25	1.49	.76	.85	.95	1.27	.75
5	1.95	.96	.83	.85	1.62	1.81	1.98
6	1.51	1.29	.74	.85	.94	1.31	1.02
7	1.24	1.54	.76	.85	.94	1.31	.72
8	1.96	.97	.86	.85	1.68	.82	2.05
9	1.69	1.25	.79	.85	1.33	1.07	1.25
10	1.77	1.17	.67	.85	1.18	1.00	1.18
11	2.50	1.10	.51	.85	1.27	.94	1.36
12	1.54	1.26	.78	.85	1.20	1.07	1.12
MEAN	1.75	1.27	.68	.85	1.17	1.05	

TABLE I - E/i

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FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.45	.85	.71	1.05	.67
2	1.55	1.32	.37	.85	.57	1.12	.51
3	2.40	1.28	.52	.85	1.25	1.09	1.15
4	1.25	1.49	.72	.85	.90	1.27	.71
5	1.95	.96	.78	.85	1.52	.81	1.86
6	1.51	1.29	.70	.85	1.06	1.09	.97
7	1.24	1.54	.72	.85	.89	1.31	.68
8	1.96	.97	.81	.85	1.59	.82	1.93
9	1.69	1.25	.75	.85	1.27	1.07	1.19
10	1.77	1.17	.63	.85	1.11	1.00	1.11
11	2.50	1.10	.49	.85	1.22	.94	1.31
12	1.54	1.26	.74	.85	1.14	1.07	1.06
MEAN	1.75	1.27	.64	.85	1.10	1.05	

TABLE I - E/11

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.48	.95	.76	1.18	.64
2	1.55	1.32	.39	.95	.60	1.25	.48
3	2.40	1.28	.55	.95	1.32	1.22	1.09
4	1.25	1.49	.76	.95	.95	1.42	.67
5	1.95	.96	.83	.95	1.62	.91	1.78
6	1.51	1.29	.74	.95	1.12	1.22	.91
7	1.24	1.54	.76	.95	.94	1.47	.64
8	1.96	.97	.86	.95	1.68	.92	1.83
9	1.69	1.25	.79	.96	1.33	1.19	1.12
10	1.77	1.17	.67	.95	1.18	1.11	1.06
11	2.50	1.10	.51	.95	1.27	1.05	1.22
12	1.54	1.26	.78	.95	1.20	1.20	1.00
MEAN	1.75	1.27	.68	.95	1.17	1.18	

TABLE I - F/i

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FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	1.58	1.24	.45	.95	.71	1.18	.60
2	1.55	1.32	.37	.95	.57	1.25	.46
3	2.40	1.28	.52	.95	1.25	1.22	1.03
4	1.25	1.49	.72	.95	.90	1.42	.63
5	1.95	.96	.78	.95	1.52	.91	1.67
6	1.51	1.29	.70	.95	1.06	1.22	.86
7	1.24	1.54	.72	.95	.89	1.47	.61
8	1.96	.97	.81	.95	1.59	.92	1.72
9	1.69	1.25	.75	.95	1.27	1.19	1.06
10	1.77	1.17	.63	.95	1.11	1.11	1.00
11	2.50	1.10	.49	.95	1.22	1.05	1.17
12	1.54	1.26	.74	.95	1.14	1.20	.95
MEAN	1.75	1.27	.64	.95	1.10	1.18	

TABLE I – F/ii

Scenario II

"Contribution of Raw Material
Costs to Competitive Potential"

TABLE II

RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
A	.71	.90	1.226	1.108
B	.71	.90	1.226	1.107
C	.71	.90	1.226	1.107
D	.71	.90	1.226	1.106
E	.71	.90	1.226	1.106
F	.71	.90	1.227	1.105

Scenario III

"Contribution of Labor Costs
to Competitive Potential"

FIRM	COST SUPERIORITY INDEX		GENERAL EFFICIENCY		COMPETITIVE POTENTIAL		LEVEL OF COMPETITIVENESS INDEX
	Firm	Competitor	Firm	Competitor	Firm	Competitor	
	β_F	β_C	E_F	E_C	M_F	M_C	C
1	2.50	1.20	.50	.90	1.25	1.08	1.16
2	1.41	1.32	.41	.90	.58	1.19	.49
3	1.85	1.30	.58	.90	1.07	1.17	.92
4	1.25	1.49	.80	.90	1.00	1.34	.74
5	2.30	.94	.87	.90	2.00	.85	2.35
6	1.32	1.29	.78	.90	1.03	1.16	.89
7	1.27	1.54	.80	.90	1.01	1.39	.73
8	2.50	.95	.91	.90	2.28	.85	2.67
9	1.72	1.25	.83	.90	1.42	1.13	1.26
10	1.77	1.17	.70	.90	1.24	1.05	1.18
11	2.27	1.11	.54	.90	1.23	1.00	1.23
12	1.91	1.25	.82	.90	1.57	1.13	1.39
MEAN	1.84	1.23	.71	.90	1.31	1.11	

TABLE III – A

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	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE III-B	B/i	.71	.90	1.16	1.12
	B/ii	.71	.90	1.10	1.13
	B/iii	.71	.90	1.06	1.13
	B/iv	.71	.90	1.01	1.13
	B/v	.71	.90	.98	1.14
TABLE III-C	C/i	.71	.90	1.19	1.12
	C/ii	.71	.90	1.13	1.12
	C/iii	.71	.90	1.09	1.13
	C/iv	.71	.90	1.04	1.13
	C/v	.71	.90	1.00	1.13
TABLE III-D	D/i	.71	.90	1.23	1.12
	D/ii	.71	.90	1.16	1.12
	D/iii	.71	.90	1.11	1.12
	D/iv	.71	.90	1.07	1.13
	D/v	.71	.90	1.03	1.13
TABLE III-E	E/i	.71	.90	1.26	1.11
	E/ii	.71	.90	1.20	1.12
	E/iii	.71	.90	1.14	1.12
	E/iv	.71	.90	1.09	1.13
	E/v	.71	.90	1.05	1.13
TABLE III-F	F/i	.71	.90	1.29	1.11
	F/ii	.71	.90	1.23	1.12
	F/iii	.71	.90	1.17	1.12
	F/iv	.71	.90	1.20	1.12
	F/v	.71	.90	1.08	1.13

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE III-G	G/i	.71	.90	1.33	1.11
	G/ii	.71	.90	1.26	1.12
	G/iii	.71	.90	1.20	1.12
	G/iv	.71	.90	1.15	1.12
	G/v	.71	.90	1.10	1.12
TABLE III-H	H/i	.71	.90	1.36	1.11
	H/ii	.71	.90	1.29	1.11
	H/iii	.71	.90	1.23	1.12
	H/iv	.71	.90	1.17	1.12
	H/v	.71	.90	1.13	1.12
	H/vi	.71	.90	1.09	1.13

Scenario IV

"Contribution of Interest
Rates to Competitive Potential"

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE IV-A	A/i	.71	.90	1.23	1.06
	A/ii	.71	.90	1.24	1.01
	A/iii	.71	.90	1.25	.95
	A/iv	.71	.90	1.26	.90
	A/v	.71	.90	1.27	.84
	A/vi	.71	.90	1.31	.77
TABLE IV-B	B/i	.71	.90	1.24	.97
	B/ii	.71	.90	1.25	.93
	B/iii	.71	.90	1.26	.89
	B/iv	.71	.90	1.27	.85
	B/v	.71	.90	1.29	.81
	B/vi	.71	.90	1.31	.77
	B/vii	.71	.90	1.36	.73
TABLE IV-C	C/i	.71	.90	1.22	1.17
	C/ii	.71	.90	1.22	1.28
TABLE IV-D	D/i	.71	.90	1.24	1.01
	D/ii	.71	.90	1.23	1.08

Scenario V

"Contribution of Subsidy to
Competitive Potential"

TABLE   V-A

RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
A/i	.71	.90	1.24	1.10
A/ii	.7$\bar{1}$	.90	1.24	1.09
A/iii	.71	.90	1.24	1.09
A/iv	.71	.90	1.24	1.08
A/v	.71	.90	1.25	1.08
A/vi	.71	.90	1.25	1.07
A/vii	.71	.90	1.25	1.07
A/viii	.71	.90	1.26	1.07

Scenario VI

"Contribution of General
Efficiency and Raw Material
Costs to Competitive Potential"

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE VI-A	A/i	.68	.86	1.207	1.054
	A/ii	.68	.86	1.207	1.053
	A/iii	.68	.86	1.208	1.052
	A/iv	.68	.86	1.208	1.052
	A/v	.68	.86	1.209	1.052
	A/vi	.68	.86	1.209	1.051
TABLE VI-B	B/i	.66	.88	1.149	1.080
	B/ii	.66	.88	1.150	1.080
	B/iii	.66	.88	1.150	1.079
	B/iv	.66	.88	1.151	1.079
	B/v	.66	.88	1.152	1.079
	B/vi	.66	.88	1.153	1.078
TABLE VI-C	C/i	.66	.88	1.190	1.087
	C/ii	.66	.88	1.190	1.086
	C/iii	.66	.88	1.191	1.086
	C/iv	.66	.88	1.191	1.085
	C/v	.66	.88	1.191	1.085
	C/vi	.66	.88	1.192	1.084
TABLE VI-D	D/i	.73	.86	1.261	1.061
	D/ii	.73	.86	1.262	1.060
	D/iii	.73	.86	1.263	1.059
	D/iv	.73	.86	1.264	1.059
	D/v	.73	.86	1.265	1.059
	D/vi	.73	.86	1.266	1.058

TABLE VI-E

RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
E/i	.66	.86	1.148	1.082
E/ii	.66	.86	1.149	1.082
E/iii	.66	.86	1.150	1.081
E/iv	.66	.86	1.151	1.080
E/v	.66	.86	1.151	1.080
E/vi	.66	,86	1.152	1.080

Scenario VII

"Contribution of General
Efficiency and Labor Costs
to Competitive Potential"

Here A1 shows 1st increase in labor costs, A2 shows 2nd increase in labor
costs and so forth. (i) shows 1st random data set for general efficiency,
(ii) shows 2nd random data set for general efficiency etc.

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE VII-A1	A1/i	.68	.86	1.14	1.07
	A1/ii	.66	.88	1.082	1.091
	A1/iii	.66	.88	1.12	1.10
	A1/iv	.66	.88	1.19	1.07
	A1/v	.73	.86	1.081	1.094
TABLE VII-A2	A2/i	.68	.86	1.08	1.07
	A2/ii	.66	.88	1.029	1.095
	A2/iii	.66	.88	1.07	1.10
	A2/iv	.73	.86	1.13	1.08
	A2/v	.66	.88	1.027	1.098
TABLE VII-A3	A3/i	.68	.86	1.04	1.07
	A3/ii	.66	.88	.986	1.098
	A3/iii	.66	.88	1.02	1.11
	A3/iv	.73	.86	1.081	1.079
	A3/v	.66	.88	.984	1.102

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE VII-B1	B1/i	.68	.86	1.17	1.06
	B1/ii	.66	.88	1.11	1.09
	B1/iii	.66	.88	1.16	1.10
	B1/iv	.73	.86	1.22	1.07
	B1/v	.66	.88	1.11	1.09
TABLE VII-B2	B2/i	.68	.86	1.11	1.07
	B2/ii	.66	.88	1.06	1.09
	B2/iii	.66	.88	1.097	1.100
	B2/iv	.73	.86	1.16	1.07
	B2/v	.66	.88	1.06	1.10
TABLE VII-B3	B3/i	.68	.86	1.065	1.070
	B3/ii	.66	.88	1.013	1.096
	B3/iii	.66	.88	1.05	1.10
	B3/iv	.73	.86	1.11	1.08
	B3/v	.66	.88	1.01	1.10

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE VII-C1	C1/i	.68	.86	1.21	1.06
	C1/ii	.66	.88	1.15	1.09
	C1/iii	.66	.88	1.19	1.10
	C1/iv	.73	.86	1.26	1.07
	C1/v	.66	.88	1.15	1.09
TABLE VII-C2	C2/i	.68	.86	1.14	1.07
	C2/ii	.66	.88	1.087	1.090
	C2/iii	.66	.88	1.13	1.10
	C2/iv	.73	.86	1.19	1.07
	C2/v	.66	.88	1.086	1.094
TABLE VII-C3	C3/i	.68	.86	1.09	1.07
	C3/ii	.66	.88	1.040	1.094
	C3/iii	.66	.88	1.08	1.10
	C3/iv	.73	.86	1.14	1.08
	C3/v	.66	.88	1.038	1.097
TABLE VII-C4	C4/i	.68	.86	1.05	1.07
	C4/ii	.66	.88	.996	1.097
	C4/iii	.66	.88	1.03	1.11
	C4/iv	.73	.86	1.09	1.08
	C4/v	.66	.88	.994	1.10

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE VII-D1	D1/i	.68	.86	1.24	1.06
	D1/ii	.66	.88	1.18	1.09
	D1/iii	.66	.88	1.22	1.09
	D1/iv	.73	.86	1.29	1.07
	D1/v	.66	.88	1.18	1.09
TABLE VII-D2	D2/i	.68	.86	1.18	1.06
	D2/ii	.66	.88	1.12	1.09
	D2/iii	.66	.88	1.16	1.10
	D2/iv	.73	.86	1.22	1.07
	D2/v	.66	.88	1.12	1.09
TABLE VII-D3	D3/i	.68	.86	1.12	1.07
	D3/ii	.66	.88	1.067	1.092
	D3/iii	.66	.88	1.11	1.10
	D3/iv	.73	.86	1.17	1.07
	D3/v	.66	.88	1.065	1.095
TABLE VII-D4	D4/i	.68	.86	1.073	1.070
	D4/ii	.66	.88	1.021	1.095
	D4/iii	.66	.88	1.06	1.10
	D4/iv	.73	.86	1.12	1.08
	D4/v	.66	.88	1.019	1.099

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE VII-E1	E1/i	.68	.86	1.27	1.06
	E1/ii	.66	.88	1.21	1.08
	E1/iii	.66	.88	1.26	1.09
	E1/iv	.73	.86	1.33	1.07
	E1/v	.66	.88	1.21	1.09
TABLE VII-E2	E2/i	.68	.86	1.21	1.06
	E2/ii	.66	.88	1.15	1.09
	E2/iii	.66	.88	1.19	1.10
	E2/iv	.73	.86	1.26	1.07
	E2/v	.66	.88	1.15	1.09
TABLE VII-E3	E3/i	.68	.86	1.15	1.07
	E3/ii	.66	.88	1.094	1.090
	E3/iii	.66	.88	1.14	1.10
	E3/iv	.73	.86	1.20	1.07
	E3/v	.66	.88	1.092	1.094
TABLE VII-E4	E4/i	.68	.86	1.10	1.07
	E4/ii	.66	.88	1.046	1.093
	E4/iii	.66	.88	1.08	1.10
	E4/iv	.73	.86	1.15	1.07
	E4/v	.66	.88	1.044	1.097
TABLE VII-E5	E5/i	.68	.86	1.06	1.07
	E5/ii	.66	.88	1.006	1.096
	E5/iii	.66	.88	1.04	1.10
	E5/iv	.73	.86	1.10	1.08
	E5/v	.66	.88	1.004	1.100

TABLE VII-E6

RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
E6/i	0.68	0.86	1.31	1.06
E6/ii	0.66	0.88	1.24	1.08
E6/iii	0.66	0.88	1.29	1.09
E6/iv	0.73	0.86	1.36	1.06
E6/v	0.66	0.88	1.24	1.09

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE VII-F1	F1/i	.68	.86	1.31	1.06
	F1/ii	.66	.88	1.24	1.08
	F1/iii	.66	.88	1.29	1.09
	F1/iv	.73	.86	1.36	1.06
	F1/v	.66	.88	1.24	1.09
TABLE VII-F2	F2/i	.68	.86	1.24	1.06
	F2/ii	.66	.88	1.18	1.09
	F2/iii	.66	.88	1.22	1.09
	F2/iv	.73	.86	1.29	1.07
	F2/v	.66	.88	1.17	1.09
TABLE VII-F3	F3/i	.68	.86	1.18	1.06
	F3/ii	.66	.88	1.12	1.09
	F3/iii	.66	.88	1.16	1.10
	F3/iv	.73	.86	1.23	1.07
	F3/v	.66	.88	1.12	1.09
TABLE VII-F4	F4/i	.68	.86	1.13	1.07
	F4/ii	.66	.88	1.071	1.091
	F4/iii	.66	.88	1.11	1.10
	F4/iv	.73	.86	1.17	1.07
	F4/v	.66	.88	1.069	1.095
TABLE VII-F5	F5/i	.68	.86	1.08	1.07
	F5/ii	.66	.88	1.029	1.095
	F5/iii	.66	.88	1.07	1.10
	F5/iv	.73	.86	1.13	1.08
	F5/v	.66	.88	1.027	1.098

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE VII-G1	G1/i	.68	.86	1.34	1.06
	G1/ii	.66	.88	1.27	1.08
	G1/iii	.66	.88	1.33	1.09
	G1/iv	.73	.86	1.40	1.06
	G1/v	.66	.88	1.27	1.08
TABLE VII-G2	G2/i	.68	.86	1.27	1.06
	G2/ii	.66	.88	1.20	1.08
	G2/iii	.66	.88	1.25	1.09
	G2/iv	.73	.86	1.32	1.07
	G2/v	.66	.88	1.20	1.09
TABLE VII-G3	G3/i	.68	.86	1.21	1.06
	G3/ii	.66	.88	1.15	1.09
	G3/iii	.66	.88	1.19	1.10
	G3/iv	.73	.86	1.26	1.07
	G3/v	.66	.88	1.15	1.09
TABLE VII-G4	G4/i	.68	.86	1.15	1.0
	G4/ii	.66	.88	1.096	1.090
	G4/iii	.66	.88	1.137	1.098
	G4/iv	.73	.86	1.201	1.071
	G4/v	.66	.88	1.095	1.093
TABLE VII-G5	G5/i	.68	.86	1.11	1.07
	G5/ii	.66	.88	1.052	1.093
	G5/iii	.66	.88	1.09	1.10
	G5/iv	.73	.86	1.15	1.07
	G5/v	.66	.88	1.051	1.096

TABLE VII-H

RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
H/i	.68	.86	1.31	1.06
H/ii	.66	.88	1.22	1.08
H/iii	.66	.88	1.23	1.09
H/iv	.73	.86	1.32	1.06
H/v	.66	.66	1.19	1.09

Scenario VIII

"Contribution of General
Efficiency and Interest
Rates to Competitive Potential"

Here, A1 denotes the first decrease in the interest rates, A2 denotes the
second decrease in the interest rates etc.; (i) denotes first random data
set, (ii) denotes second random data set and so forth.

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE VIII-A1	A1/i	.68	.86	1.21	1.01
	A1/ii	.66	.88	1.15	1.03
	A1/iii	.66	.88	1.20	1.04
	A1/iv	.66	.88	1.26	1.02
	A1/v	.66	.88	1.15	1.04
TABLE VIII-A2	A2/i	.68	.86	1.22	.96
	A2/ii	.66	.88	1.16	.98
	A2/iii	.66	.88	1.20	.99
	A2/iv	.73	.86	1.27	.96
	A2/v	.66	.88	1.16	.98
TABLE VIII-A3	A3/i	.68	.86	1.22	.90
	A3/ii	.66	.88	1.16	.93
	A3/iii	.66	.88	1.20	.93
	A3/iv	.73	.86	1.28	.91
	A3/v	.66	.88	1.16	.93
TABLE VIII-A4	A4/i	.68	.86	1.24	.85
	A4/ii	.66	.88	1.18	.87
	A4/iii	.66	.88	1.22	.88
	A4/iv	.73	.86	1.29	.86
	A4/v	.66	.88	1.17	.88
TABLE VIII-A5	A5/i	.68	.86	1.25	.80
	A5/ii	.66	.88	1.19	.82
	A5/iii	.66	.88	1.23	.83
	A5/iv	.73	.86	1.30	.81
	A5/v	.66	.88	1.19	.82

TABLE VIII-A6

RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
A6/i	.68	.86	1.29	.74
A6/ii	.66	.88	1.23	.75
A6/iii	.66	.88	1.27	.76
A6/iv	.73	.86	1.34	.74
A6/v	.66	.88	1.22	.76

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE VIII-B1	B1/i	.68	.86	1.23	.88
	B1/ii	.66	.88	1.17	.90
	B1/iii	.66	.88	1.21	.91
	B1/iv	.73	.86	1.28	.89
	B1/v	.66	.88	1.17	.91
TABLE VIII-B2	B2/i	.68	.86	1.24	.85
	B2/ii	.66	.88	1.18	.87
	B2/iii	.66	.88	1.22	.87
	B2/iv	.73	.86	1.29	.85
	B2/v	.66	.88	1.18	.87
TABLE VIII-B3	B3/i	.68	.86	1.25	.81
	B3/ii	.66	.88	1.19	.83
	B3/iii	.66	.88	1.23	.84
	B3/iv	.73	.86	1.30	.82
	B3/v	.66	.88	1.19	.83
TABLE VIII-B4	B4/i	.68	.86	1.26	.77
	B4/ii	.66	.88	1.20	.79
	B4/iii	.66	.88	1.24	.80
	B4/iv	.73	.86	1.32	.78
	B4/v	.66	.88	1.20	.79
TABLE VIII-B5	B5/i	.68	.86	1.29	.74
	B5/ii	.66	.88	1.23	.75
	B5/iii	.66	.88	1.27	.76
	B5/iv	.73	.86	1.34	.74
	B5/v	.66	.88	1.22	.76

TABLE VIII-B6

RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
B6/i	.68	.86	1.34	.69
B6/ii	.66	.88	1.28	.71
B6/iii	.66	.88	1.31	.72
B6/iv	.73	.86	1.40	.70
B6/v	.66	.88	1.27	.71

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE VIII-C1	C1/i	.68	.86	1.20	1.11
	C1/ii	.66	.88	1.142	1.140
	C1/iii	.66	.88	1.19	1.15
	C1/iv	.73	.86	1.25	1.12
	C1/v	.66	.88	1.141	1.144
TABLE VIII-C2	C2/i	.68	.86	1.20	1.22
	C2/ii	.66	.88	1.14	1.24
	C2/iii	.66	.88	1.18	1.26
	C2/iv	.73	.86	1.25	1.23
	C2/v	.68	.88	1.14	1.25

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE VIII-D1	D1/i	.68	.86	1.22	.96
	D1/ii	.66	.88	1.16	.98
	D1/iii	.66	.88	1.20	.99
	D1/iv	.73	.86	1.27	.96
	D1/v	.66	.88	1.16	.98
TABLE VIII-D2	D2/i	.68	.86	1.21	1.03
	D2/ii	.66	.88	1.15	1.05
	D2/iii	.66	.88	1.19	1.06
	D2/iv	.73	.86	1.26	1.04
	D2/v	.66	.88	1.15	1.06

Scenario IX

"Contribution of General
Efficiency and Subsidy to
Competitive Potential"

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE IX-A	A/i	.68	.86	1.22	1.04
	A/ii	.66	.88	1.15	1.07
	A/iii	.66	.88	1.20	1.08
	A/iv	.66	.88	1.27	1.05
	A/v	.73	.86	1.16	1.07
TABLE IX-B	B/i	.68	.86	1.22	1.04
	B/ii	.66	.88	1.16	1.07
	B/iii	.66	.88	1.20	1.07
	B/iv	.73	.86	1.27	1.05
	B/v	.66	.88	1.16	1.07
TABLE IX-C	C/i	.68	.86	1.22	1.03
	C/ii	.66	.88	1.16	1.06
	C/iii	.66	.88	1.21	1.07
	C/iv	.73	.86	1.27	1.04
	C/v	.66	.88	1.16	1.06
TABLE IX-D	D/i	.68	.86	1.22	1.03
	D/ii	.66	.88	1.16	1.05
	D/iii	.66	.88	1.21	1.06
	D/iv	.73	.86	1.28	1.03
	D/v	.66	.88	1.17	1.06
TABLE IX-E	E/i	.68	.86	1.23	1.02
	E/ii	.66	.88	1.16	1.05
	E/iii	.66	.88	1.21	1.06
	E/iv	.73	.86	1.28	1.03
	E/v	.66	.88	1.17	1.05

RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
F/i	.68	.86	1.23	1.03
F/ii	.68	.86	1.16	1.04
F/iii	.68	.86	1.21	1.05
F/iv	.73	.86	1.28	1.03
F/v	.66	.86	1.17	1.05

Scenario X

"Contribution of Labor Costs
and Raw Material Costs to
Competitive Potential"

Here, A1 shows first labor cost increase, A2 shows second labor cost
increase etc.; (i) shows first raw material cost set, (ii) shows second
raw-material set etc.

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE X-A1	A1/i	.71	.90	1.192	1.110
	A1/ii	.71	.90	1.192	1.109
	A1/iii	.71	.90	1.192	1.109
	A1/iv	.71	.90	1.193	1.108
	A1/v	.71	.90	1.193	1.108
	A1/vi	.71	.90	1.193	1.107
TABLE X-A2	A2/i	.71	.90	1.226	1.108
	A2/ii	.71	.90	1.226	1.107
	A2/iii	.71	.90	1.226	1.107
	A2/iv	.71	.90	1.227	1.106
	A2/v	.71	.90	1.226	1.106
	A2/vi	.71	.90	1.227	1.105
TABLE X-A3	A3/i	.71	.90	1.260	1.106
	A3/ii	.71	.90	1.260	1.106
	A3/iii	.71	.90	1.260	1.105
	A3/iv	.71	.90	1.260	1.105
	A3/v	.71	.90	1.260	1.104
	A3/vi	.71	.90	1.261	1.104

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE X-B1	B1/i	.71	.90	1.133	1.114
	B1/ii	.71	.90	1.133	1.113
	B1/iii	.71	.90	1.133	1.113
	B1/iv	.71	.90	1.133	1.112
	B1/v	.71	.90	1.133	1.112
	B1/vi	.71	.90	1.134	1.111
TABLE X-B2	B2/i	.71	.90	1.164	1.112
	B2/ii	.71	.90	1.164	1.111
	B2/iii	.71	.90	1.164	1.110
	B2/iv	.71	.90	1.164	1.110
	B2/v	.71	.90	1.164	1.110
	B2/vi	.71	.90	1.165	1.109
TABLE X-B3	B3/i	.71	.90	1.195	1.110
	B3/ii	.71	.90	1.195	1.109
	B3/iii	.71	.90	1.195	1.109
	B3/iv	.71	.90	1.195	1.108
	B3/v	.71	.90	1.195	1.108
	B3/vi	.71	.90	1.196	1.107
TABLE X-B4	B4/i	.71	.90	1.226	1.108
	B4/ii	.71	.90	1.226	1.107
	B4/iii	.71	.90	1.227	1.107
	B4/iv	.71	.90	1.227	1.106
	B4/v	.71	.90	1.226	1.106
	B4/vi	.71	.90	1.227	1.105

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE X-C1	C1/i	.71	.90	1.084	1.118
	C1/ii	.71	.90	1.084	1.117
	C1/iii	.71	.90	1.084	1.116
	C1/iv	.71	.90	1.085	1.116
	C1/v	.71	.90	1.085	1.115
	C1/vi	.71	.90	1.085	1.115
TABLE X-C2	C2/i	.71	.90	1.113	1.115
	C2/ii	.71	.90	1.113	1.115
	C2/iii	.71	.90	1.113	1.114
	C2/iv	.71	.90	1.113	1.113
	C2/v	.71	.90	1.113	1.113
	C2/vi	.71	.90	1.114	1.113
TABLE X-C3	C3/i	.71	.90	1.142	1.113
	C3/ii	.71	.90	1.142	1.113
	C3/iii	.71	.90	1.142	1.112
	C3/iv	.71	.90	1.142	1.111
	C3/v	.71	.90	1.142	1.111
	C3/vi	.71	.90	1.142	1.111
TABLE X-C4	C4/i	.71	.90	1.170	1.111
	C4/ii	.71	.90	1.170	1.111
	C4/iii	.71	.90	1.171	1.110
	C4/iv	.71	.90	1.171	1.110
	C4/v	.71	.90	1.171	1.109
	C4/vi	.71	.90	1.171	1.109

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE X-D1	D1/i	.71	.90	1.040	1.121
	D1/ii	.71	.90	1.040	1.121
	D1/iii	.71	.90	1.040	1.120
	D1/iv	.71	.90	1.040	1.120
	D1/v	.71	.90	1.040	1.119
	D1/vi	.71	.90	1.041	1.119
TABLE X-D2	D2/i	.71	.90	1.066	1.119
	D2/ii	.71	.90	1.066	1.118
	D2/iii	.71	.90	1.067	1.118
	D2/iv	.71	.90	1.067	1.117
	D2/v	.71	.90	1.067	1.117
	D2/vi	.71	.90	1.067	1.116
TABLE X-D3	D3/i	.71	.90	1.093	1.117
	D3/ii	.71	.90	1.093	1.116
	D3/iii	.71	.90	1.093	1.116
	D3/iv	.71	.90	1.094	1.115
	D3/v	.71	.90	1.093	1.115
	D3/vi	.71	.90	1.094	1.114
TABLE X-D4	D4/i	.71	.90	1.120	1.115
	D4/ii	.71	.90	1.120	1.114
	D4/iii	.71	.90	1.120	1.113
	D4/iv	.71	.90	1.120	1.113
	D4/v	.71	.90	1.120	1.113
	D4/vi	.71	.90	1.120	1.112

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE X-D5	D5/i	.71	.90	1.146	1.113
	D5/ii	.71	.90	1.146	1.112
	D5/iii	.71	.90	1.146	1.112
	D5/iv	.71	.90	1.147	1.111
	D5/v	.71	.90	1.147	1.111
	D5/vi	.71	.90	1.147	1.110
TABLE X-D6	D6/i	.71	.90	1.173	1.111
	D6/ii	.71	.90	1.173	1.111
	D6/iii	.71	.90	1.173	1.110
	D6/iv	.71	.90	1.173	1.109
	D6/v	.71	.90	1.173	1.109
	D6/vi	.71	.90	1.174	1.109
TABLE X-D7	D7/i	.71	.90	1.199	1.110
	D7/ii	.71	.90	1.199	1.109
	D7/iii	.71	.90	1.200	1.108
	D7/iv	.71	.90	1.200	1.108
	D7/v	.71	.90	1.200	1.108
	D7/vi	.71	.90	1.200	1.107

Scenario XI

"Contribution of Raw Material
Costs, Labor Costs and General
Efficiency to Competitive Poten

Here, Al denotes first foreign labor costs increase, A2 second foreign lab
costs increase etc., (i) denotes first random data set for general efficie
and first raw material projection, (ii) denotes second random data set for
general efficiency and second raw material projection etc.

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE XI-A1	A1/i	.68	.86	1.17	1.06
	A1/ii	.66	.88	1.12	1.08
	A1/iii	.66	.88	1.16	1.09
	A1/iv	.73	.86	1.23	1.06
	A1/v	.66	.88	1.12	1.08
TABLE XI-A2	A2/i	.68	.86	1.20	1.05
	A2/ii	.66	.88	1.15	1.08
	A2/iii	.66	.88	1.19	1.09
	A2/iv	.73	.86	1.26	1.06
	A2/v	.66	.88	1.15	1.08
TABLE XI-A3	A3/i	,68	.86	1.24	1.05
	A3/ii	.66	.88	1.18	1.08
	A3/iii	.66	.88	1.22	1.08
	A3/iv	.73	.86	1.30	1.06
	A3/v	.66	.88	1.18	1.08

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE XI-B1	B1/i	.68	.86	1.11	1.06
	B1/ii	.66	.88	1.068	1.085
	B1/iii	.66	.88	1.097	1.091
	B1/iv	.73	.86	1.17	1.06
	B1/v	.66	.88	1.063	1.086
TABLE XI-B2	B2/i	.68	.86	1.15	1.06
	B2/ii	.66	.88	1.091	1.083
	B2/iii	.66	.88	1.13	1.09
	B2/iv	.73	.86	1.20	1.06
	B2/v	.66	.88	1.093	1.084
TABLE XI-B3	B3/i	.68	.86	1.18	1.06
	B3/ii	.66	.88	1.12	1.08
	B3/iii	.66	.88	1.16	1.09
	B3/iv	.73	.86	1.23	1.06
	B3/v	.66	.88	1.12	1.08
TABLE XI-B4	B4/i	.68	.86	1.21	1.05
	B4/ii	.66	.88	1.15	1.08
	B4/iii	.66	.88	1.19	1.09
	B4/iv	.73	.86	1.26	1.06
	B5/v	.66	.88	1.15	1.08

	RUN	$\bar{E}_F$	$\bar{E}_C$	$\bar{M}_F$	$\bar{M}_C$
TABLE XI-C1	C1/i	.68	.86	1.066	1.063
	C1/ii	.66	.88	1.017	1.089
	C1/iii	.66	.88	1.05	1.10
	C1/iv	.73	.86	1.12	1.07
	C1/v	.66	.88	1.017	1.089
TABLE XI-C2	C2/i	.68	.86	1.09	1.06
	C2/ii	.66	.88	1.044	1.087
	C2/iii	.66	.88	1.08	1.09
	C2/iv	.73	.86	1.15	1.07
	C2/v	.66	.88	1.045	1.087
TABLE XI-C3	C3/i	.68	.86	1.12	1.06
	C3/ii	.66	.88	1.071	1.085
	C3/iii	.66	.88	1.11	1.09
	C3/iv	.73	.86	1.18	1.06
	C3/v	.66	.88	1.072	1.085
TABLE XI-C4	C4/i	.68	.86	1.15	1.06
	C4/ii	.66	.88	1.098	1.083
	C4/iii	.66	.88	1.14	1.09
	C4/iv	.73	.86	1.21	1.06
	C4/v	.66	.88	1.099	1.083
TABLE XI-C5	C5/i	.68	.86	1.18	1.06
	C5/ii	.66	.88	1.13	1.08
	C5/iii	.66	.88	1.17	1.09
	C5/iv	.73	.86	1.24	1.06
	C5/v	.66	.88	1.13	1.08

TABLE   X-C5

RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
C5/i	,71	.90	1.199	1.110
C5/ii	.71	.90	1.199	1.109
C5/iii	.71	.90	1.199	1.108
C5/iv	.71	.90	1.200	1.108
C5/v	.71	.90	1.200	1.108
C5/vi	.71	.90	1.200	1.107

	RUN	$\overline{E}_F$	$\overline{E}_C$	$\overline{M}_F$	$\overline{M}_C$
TABLE XI-D1	D1/i	.68	.86	1.07	1.06
	D1/ii	.66	.88	1.025	1.088
	D1/iii	.66	.88	1.06	1.09
	D1/iv	.73	.86	1.13	1.07
	D1/v	.66	.88	1.03	1.09
TABLE XI-D2	D2/i	.68	.86	1.10	1.06
	D2/ii	.66	.88	1.050	1.086
	D2/iii	.66	.88	1.08	1.09
	D2/iv	.73	.86	1.15	1.07
	D2/v	.66	.88	1.051	1.087
TABLE XI-D3	D3/i	.68	.86	1.13	1.06
	D3/ii	.66	.88	1.075	1.084
	D3/iii	.66	.88	1.11	1.09
	D3/iv	.73	.86	1.18	1.06
	D3/v	.66	.88	1.076	1.085
TABLE XI-D4	D4/i	.68	.86	1.18	1.06
	D4/ii	.66	.88	1.125	1.081
	D4/iii	.66	.88	1.16	1.09
	D4/iv	.73	.86	1.24	1.06
	D4/v	.66	.88	1.126	1.082