PROJECT OF ESTABLISHING A BALL—POINT PEN PLANT

IN LEBANON — FEASIBILITY STUDY

By

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this thesis is to determine the feasibility of a ball-point pen factory in Lebanon, by studying its marketing, technical cost, and financial aspects; to help the entrepreneur in deciding about its feasibility according to his particular situation and the other alternative investments available to him.

Justification

"The trading, banking and exchange activities that have brought Lebanon to its present position seem destined to rather severe limitations through political and economic changes in the surrounding Arab world."[1] It is therefore the role of the entrepreneur and the government to introduce something new to the Lebanese economy to justify their prime role as agents of economic development.[2] In what other sectors of the economy these new investments have to be created since Lebanon can no

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[1] Yusuf Sayigh, _Entrepreneurs of Lebanon_, (Cambridge, Massachussets: Harvard University Press, 1962), p. xii.

[2] _Ibid._

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more count on the services sector? Priority must be given to the industrial sector because it is the only sector which could achieve a balanced economic development in spite of the limitations in the market potentials and the scarcity of natural resources. The reasons behind this primordial role to be given to industry will be explained fully in Chapter II.

Moreover, to promote this important sector of the economy, new investments have to be made by both the private and public sector; which requires studies and research in order that these new projects be achieved on a sound economic basis.

For these reasons, the writer chose this topic in which he will try to show and study the steps that should be followed in deciding about any project in general, and about this project in particular. In this respect, any entrepreneur will decide to undertake or reject this project according to his particular situation and the alternatives available.

Methods of Research and Presentation

This thesis is mostly based on data obtained personally through correspondence with companies and factories in Europe about the establishment of a ball-point pen factory

in Lebanon and through a questionnaire distributed to the
consumers of ball-point pens in Lebanon. These data were
supplemented by published material mentioned in the bibliography,
by personal interviews of consumers and marketing agencies, and
by interviews of Lebanese industrialists about new investments in
industry and the future of such investments.

Chapter II reviews the growth of Lebanese industry and
the importance of the industrial sector in the development of the
economy. Chapter III presents a market survey of ball-point pen
consumption in Lebanon. Chapter IV discusses a technical study
about ball-point pen production. Chapter V presents a study of
the total costs of the project and a study about the costs of
units of production. Chapter VI discusses the financial aspect
of the project to determine its financial feasibility. At the
end of each chapter, a section is devoted to the problems facing
the project and the suggested solutions to solve these problems.

Scope and Limitations

This thesis includes a market survey of ball-point pen
consumption, a cost and technical study, and a financial analysis.
The limitations arise in the market study in relation to the
accuracy of the results obtained from the questionnaires
distributed to the consumers. To judge the accuracy of the

answers to the questionnaire, a cross-checking method was used according to standard procedures.[1] This method tended to reduce the probability of error in the results of interviews, and to locate the answers where consumers do not reply sincerely, but did not eliminate the possibility of errors due to a tendency on the part of the consumer to distort the results. Furthermore, a sample chosen may not be strictly representative of the Lebanese market. This limitation was remedied by dividing potential consumers in several market segments where their behaviour is nearly the same.[2]

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[1]Refer to Appendix, p.77-78.

[2]Refer to Demand Analysis, p. 24.

CHAPTER II

THE INDUSTRIAL SECTOR AND THE LEBANESE ECONOMY

Lebanese industry, which ranks third among other contributing sectors to the national income after trade and agriculture, has to play a more important role in the future due to the structure of the Lebanese economy. Before showing the reasons behind giving industry this increasing importance, a brief note on its evolution and growth will be presented.

Evolution and Growth

The political situation of Lebanon, before World War I, was not favourable for the growth of industry. Before that period, industry was limited to handicraft in activities such as silk and wool weaving, soap factories, broderies, minoteries, etc. During the period between 1918 and 1943, when the political situation in the Middle East was favourable for the growth of industry because of the custom union between Syria and Lebanon, the mandatory government did not encourage national industry. In spite of this lack of interest in the local industry on the part of the government (so that it would not compete with the French exports to the Middle East), this sector was stimulated

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during the Second World War period by the shortage of imports
from Europe and large expenditures by the Allies troops. This
increasing demand on local production enabled the Lebanese
industry to work at full capacity.

Industrial development continued to grow at a marked
rate after the war until the ending of the customs union between
Lebanon and Syria in 1950. The following contraction of the
local market decreased the rate of growth of industry and created
marketing problems. After 1950, the increasing population and
standard of living compensated for this substantial loss in the
local market. Between 1950 and 1960, the share of industry in
the national product increased from 141 million Lebanese Pounds[1]
to 214.8 million.[2] The relative increase of other sectors can
be seen in Table I.

Importance and Future

The economic structure of Lebanon is unique. It is
characterised by an overdevelopment of the tertiary sector

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[1] Etude préliminaire sur les besoins et les possibilités de
développement au Liban, La Population et ses Revenues, a
report prepared by the Institut International de Recherche
et de Formation en vue de Développement Intégral et
Harmonisé (I.R.F.E.D.), Beyrouth, 1960, I, 2-B-10-11.

[2] Le Commerce du Levant, April 15, 1962, p. 20.

(commerce and services) and an underdevelopment of the primary sector (agriculture) and the secondary sector (industry). The tertiary sector is contributing 3/5 to the national income and the other two sectors 2/5. The following table shows the development of the different sectors' contribution to the national income during the period 1952 - 1961.

NATIONAL INCOME OF LEBANON (at current factor prices)
1952 - 1958 and 1961 (in LL. Millions)

	1952	1953	1954	1955	1956	1957	1958	1961
Agriculture	216 19.4%	221 18.9%	226 17.9%	223 16.0%	231 16.0%	238 15.8%	219 16.5%	330 18.5%
Industry	155 13.9%	161 13.8%	166 13.2%	175 12.7%	183 12.9%	189 12.6%	181 13.7%	218 12.2%
Construction	48 4.3%	47 4.0%	60 4.8%	60 4.4%	50 3.5%	41 2.7%	38 2.9%	69 3.9%
Transportation and Communication	45 4.0%	50 4.3%	60 4.8%	75 5.5%	78 5.5%	80 5.3%	57 4.3%	68 3.8%
Commerce	333 29.9%	344 29.5%	368 29.0%	407 29.6%	410 28.9%	469 31.2%	365 27.5%	468 26.7%
Banking	50 4.5%	51 4.4%	57 4.5%	70 5.1%	80 5.7%	91 6.1%	93 7.0%	110 6.1%
Real Estate	98 8.8%	101 8.7%	112 8.9%	116 8.4%	130 9.2%	139 9.2%	155 11.7%	194 10.8%
Government	64 5.7%	71 6.1%	73 5.8%	83 6.0%	95 6.7%	108 7.2%	113 8.5%	152 8.5%
Services	106 9.5%	122 10.5%	134 10.7%	165 12.0%	160 11.3%	148 9.9%	104 7.9%	180 10.1%
Total	1115	1168	1256	1374	1417	1503	1325	1789

Source: Paul Klat, "The National Income of Lebanon", Middle East Express, No. 5, April 2, 1963, p. 3.

Percentages calculated.

The yearly rate of growth of the national income as it is shown in Table I has been 4.3 percent during the period 1952-1961. Thus, for a yearly demographic increase of 2.3 percent, the net increase in the national income would be 2 percent. This experienced rate of growth is not sufficient to achieve the desired economic development. As it is generally accepted, the net rate of growth of the national income must be at least 3 percent for any country which desires to achieve a well-balanced economic development.[1] Thus, if Lebanon wants to increase the standard of living of a growing population, to achieve a progressive economic development, to eliminate unemployment, and to create new work for an increasing labour force, the rate of growth of the national product must be more than 5.3 percent. If Lebanon can find the necessary investments to increase its national product from the experienced rate of 4.3 percent during the period 1952-1961 to the desired rate of 5.3 percent, the economic development of the country can be achieved. But, if new investments are not properly allocated to the different sectors of the economy as they should be, and not as they have been in the past decade, this desired rate of growth will not be able to solve the employment problem nor to achieve a well-balanced economical structure.

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[1] Le Commerce du Levant, March 15, 1962, p. 32.

During the past decade, Lebanon has experienced the
following annual rate of growth in the different sectors of the
economy shown in Table II.

TABLE 2

**AVERAGE ANNUAL RATE OF GROWTH
DURING THE PERIOD 1950-1957**

Industry	3.65%
Agriculture	1.18%
Transport	10.04%
Services	7.75%
Construction	- 0.3%
Administration	7.75%

Source: "Modèle de croissance globale pour l'économie
Libanaise", Le Commerce du Levant, (March 1962),
p. 32.

The following argument is often discussed in relation
to the economy: If Lebanon has experienced during the past
decade a period of prosperity, why not leave its economic
structure as it has been in the past; why divert new investments
from the tertiary to the primary and secondary sectors of the
economy? The general answer to that argument is that Lebanon
cannot count indefinitely on commerce and services because these
sectors are easily affected by political situations and
international fluctuations. This risk which can distort the
balance in the economy, can be hedged by encouraging the other

sectors, especially industry and agriculture, which until now have not been given the encouragement they merit.

What economic structure Lebanon must adopt to achieve the desired objective? A study on the growth of the Lebanese National product has been advanced by the I.R.F.E.D. Mission, adopting a 5.3 percent rate of growth. This study which is based on estimates, due to lack of necessary statistics, shows the investments that should be made in each sector, and the new employment created by each sector according to a stated rate of growth. The study is summarised in the following table.

TABLE 3

HYPOTHESES OF GROWTH OF THE LEBANESE NATIONAL INCOME
FOR THE PERIOD 1960 – 1975
RATE OF GROWTH 5.3% ANNUALLY

Sector	% of National Product 1960	% of National Product 1975	Annual Growth	Capital Coefficient	New Investment Needed 1960-1975 Million LL.
Agriculture	15.8	34.3	7.00	2.0	947.6
Industry	12.6	27.3	7.00	2.7	1,020.1
Construction	2.7	5.9	4.00	2.0	73.6
Lodging	9.3	20.2	4.00	10.0	1,269.0
Transport	5.3	11.5	6.00	3.0	378.6
Commerce	31.2	67.6	4.00	0.4	170.4
Finance	6.1	13.2	4.00	0.4	33.3
Public Adminis- tration	7.2	15.6	5.25	–	–
Other Services	9.8	21.2	6.00	0.4	93.4
Total	100.0	216.8			3,986.0

Source: "Modèle de croissance globale pour l'économie Libanaise", Le Commerce du Levant, (April 1962), p. 20.

TABLE 4

HYPOTHESES OF EMPLOYMENT INCREASE FOR THE PERIOD 1960-1975
RATE OF GROWTH OF THE ECONOMY 5.3% ANNUALLY

Sector	Employment 1960 (000)	Employment 1975 (000)	New Employment Created (000)	% Employment Increase Over Initial Employment (000)
Agriculture	220	297	77	35
Industry	54	112	58	107
Construction	33	44	11	33
Lodging	-	-	-	-
Transport	24	43	19	80
Commerce	53	72	19	36
Finance	2	3.7	1.7	85
Public Administration	16	20	4	25
Other Services	48	86	38	79
Total	450	677.7	227.7	

Source: "Modèle de croissance globale pour l'économie Libanaise",
Le Commerce du Levant, (April 1962), p. 20.

The study has been made for the period 1960-1975 and
a rate of growth has been allocated to each sector of the
economy, emphasizing the industrial and agricultural sectors by
giving them an annual rate of growth of 7 percent instead of the
respective rates of 3.65 percent and 1.18 percent experienced
previously. The potential employment will increase from 450,000
in 1960 to 677,000 in 1975, thus creating 227,000 new jobs in 15
years. This is sufficient to cover the needs of the increasing
population and to solve a part of the present unemployment
problem. Had the rate of growth in the different sectors of the
economy been kept as it was in the past decade, the new
employment created would have been far below this figure.

Could the rate of growth imposed on industry and
agriculture be achieved in both sectors? In the short run, it
could be achieved, but in the long run, realisation becomes
difficult in the agricultural sector due to the limited potential
agricultural area. Since the primary sector could not grow
indefinitely at this rate, priority must be given to the secondary
sector which could absorb the highest percentage of the increasing
labour force. This fact could be noticed in Table IV where for
the same rate of growth in both agricultural and industrial sectors
and with a respective coefficient of capital of 2.7 percent and
2 percent, the potential employment in industry more than doubled

while in agriculture it increased only by 35 percent.

In achieving such a model of growth of the National product, we are faced by some limitations. The first limitation is the availability of new funds to insure the necessary desired investments in all the sectors and which amount to LL.3,986 million[1] to be invested by both private and public concerns. The second limitation is the ability of investing these funds according to the schedule in Table III, especially in a free economy where the government cannot oblige the private individual to invest in a particular sector, if he has a profitable alternative in other sectors or industries. The third limitation is that of creating new investment possibilities coping with the market potentials and based on sound analysis and research so as to be profitable for the economy.

The project of establishing a ball-point pen industry in Lebanon is one of many projects in which the entrepreneur can invest, thus, making profit and justifying his role as agent in the development of the economy.

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[1]Refer to Table 3.

Problems Faced by Industry

Lebanese industry suffers from several problems and disadvantages which are retarding its rate of growth and which can handicap the achievement of the desired rate of growth suitable for a balanced economic structure.

Some of the most important problems of industry in general will be outlined in order to compare them later on with particular problems facing the establishment of a ball-point pen industry in Lebanon.

The most important problem facing industry in the narrowness of the market which limits production and creates excess capacity, thus increasing the costs of production. Moreover, the existence of several factories manufacturing the same product results in the production of an inferior quality due to price competition, thus accentuating local preference for foreign production.

Costs have also risen due to such factors as the scarcity of raw materials, and the increasing costs of labour due to the introduction of new programs such as social security. All these problems limit the field of action of the Lebanese entrepreneur who sometimes accomplishes in foreign countries what he cannot achieve in Lebanon.

CHAPTER III

DEMAND ANALYSIS

Demand analysis is the most important step in determining the feasibility of a project because the size and output of the firm are based upon the forecase of sales potentials according to a defined market.

Factors Affecting Demand

The term demand is generally used as "a dependent or functional relationship revealing the quantity that will be purchased of a particular commodity at various prices, at a given time and place."[1] Practically, the demand for any commodity is affected by other factors than price. For ball-point pens which are not durable goods, the demand is mostly influenced by the number of consumers using it, the price of competing products, and the price set by the firm.

Other factors that usually affect the demand schedule such as the buying power of consumers, seasonality, geographic location, availability of credit, etc., have a small influence

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[1]Spencer and Siegleman, Managerial Economics, Decision Making and Forward Planning, (Homewood, Illinois: Irwin, Inc., 1959), p. 135.

on ball-point pen consumption because of the product's nature and the low sale price.

Ball-Point Pen Demand Determinants

Since there is no single concept of demand, but different concepts for different problems, the demand determinants, as well as their relative importance, differ with the type and kind of information they are supposed to answer.[1] The purpose of the demand analysis in this chapter is to determine the total consumption in the Lebanese market, the firm's share of that market, and the total potential sales of the plant.

To establish the total demand, the best equation would be in that expressed in a multiple relation form:

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[1]Joel Dean, Managerial Economics, (Englewood Cliffs: Prentice-Hall, Inc., 1961), p. 145.

$$Y = \left[S_1 + P + C + G + S_2 + O \right] \quad I$$

where;

Y = Total consumption.

S_1 = Consumption of Universities and Secondary Schools for both students and professors, and professors of Primary schools.

P = Consumption of primary students.

C = Consumption of the commercial and financial sector.

G = Consumption of government officials.

O = Consumption of the rest of the population including that of foreign residents.

Each of the market segments listed in equation I are dependent on three sets of variables, namely, the total universe of each market segment, the average consumption in that particular sector, and the percentage of consumers using ball-point pens. Thus, the equation would be in the form of:

$$Y = f (X_1) (x_2)$$

where:

f = the segment universe.

X_1 = average consumption.

x_2 = percentage use.

To find the data needed for these computations, a market research project was conducted in Lebanon. Questionnaires were distributed to potential consumers, and personal interviews and observations in segments where questionnaires do not give the right information (such as in segments P and O). The type of questionnaire distributed and the method followed in the research are shown in the Appendix.[1] In this chapter, only the final results of the research will be stated.

The objective of the market research was to determine the total consumption in Lebanon, the possible share of the firm from the market, the habits of the consumers, and the price at which the product is to be sold.

Total Local Consumption

The total market is the sum of the consumption of the different market segments according to which the population was divided. (Refer to Equation I.) Each of the constituants of this equation is a factor of three variables shown under columns 1, 2, and 3, of Table V, namely, the average use per year, the percentage using the product, and the sector universe. Column 4 of Table V shows the results of each segment, while column 5

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[1]Appendix, pp. 81 and 98.

gives the segment's share of the total market, and column 6 its percentage of the population. These two latter observations will help in the distribution of the product in knowing that 60.9 percent of the total market is consumed by only 9.3 percent of the potential consumers, sales efforts will be concentrated on these two segments.

By replacing the results in column 4 of Table V in Equation I, we have:

$$Y = S_1 + P + C + G + S_2 + O$$
$$Y = 1,685,000 + 320,000 + 841,000 + 270,000 + 490,000 +$$
$$540,000 = 4,146,000$$

The accuracy of the figure for the total consumption could be controlled by computing the market potentials from other data obtained in the market research and summarized in Table VII.

Table VII shows the average number of ball-point pens held at one time by the individual consumer in each market segment, the average total number held in each segment and the average total number held by all potential consumers. The total number of ball-point pens used at any time amounts to

1,250,000 pens.[1]

Knowing the average life of one pen and assuming that
the consumer uses the product the whole year around (which is
the case regarding the product), the yearly consumption could
be computed by replacing the findings in the equation:

$$Y = ST \qquad II$$

where:

S = The total number of ball-point pens held at one time.

T = The number of pens required to assume a constant
yearly use

$$= \frac{\text{life of pen in years}^2}{1}$$

replacing the data obtained in Table VII in Equation II;

$$Y = 1,250,000 \left(\frac{1/3}{1} \right)$$

$$Y = 1,250,000 \ (\ 3 \ ) \ = \ 3,750,000$$

Thus, the total yearly consumption would amount to
3,750,000 pens. This figure is not the same as that obtained

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[1]From Table VII.

[2]The life of the pen varies between 3 and 4 months.

from Equation I, the difference is equal to 396,000 pens.[1]
This discrepancy in the results has to be revised since between
50 and 80 percent[2] of the consumers lose pens which have to be
replaced if a constant yearly use is going to be maintained.

Therefore, the difference in the results from both
equations is not material and could be ignored knowing the fact
that at least the same amount is lost yearly by potential
consumers. Thus, the final figure which will be used in further
computations for the total market potentials will be 4,000,000
units per year.[3]

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[1]The results obtained from the two equations being
4,146,000 and 3,750,000. Thus, (4,146,000 - 375,000) =
396,000.

[2]From Table VII, column 6.

[3]The figure being the rounded average between the
results from Equations I and II:

$$\frac{4,146,000 + 3,750,000}{2} = 3,948,000$$

TABLE 5

CONSUMPTION OF BALL-POINT PENS ACCORDING
TO MARKET SEGMENTS

Market Segment	(1) Average Use Per Year	(2) % of Universe Using the Product	(3) Sector Universe (000)	(4) Segment Total Consumption (000) (1x2x3)	(5) % of Total Consumption	(6) % Sector Universe of Total Universe
S_1	11	93%	165	1685	40.6	7.0
P	4	40%	200	320	7.7	8.5
C	17	90%	55	841	20.3	2.3
G	15	90%	20	270	6.5	0.9
S_2	7	70%	100	490	11.8	4.3
O	2	15%	1800	540	13.1	77.0
Total Market			2340	4146	100.0	100.0

Source: Market research.

TABLE 6

BUYING HABITS OF BALL-POINT PEN CONSUMERS
IN DIFFERENT MARKET SEGMENTS

MARKET SEGMENT	(1) N° Question-naires Tabulated	(2) N° Using Ball Pens	(3) % Using Ball-Pens from Question-naires	(4) Brand Prefer-ence	(5) Consist-ency of Brand Use	(6) % Losing Pens	(7) % Receiving Free (not buying them)
S_1	240	225	94%	Parker Bic Schneider	40%	57%	30%
P	150	60	40%	–	–	80%	–
C	60	60	100%	Parker Bic Schneider Othello	35%	80%	95%
G	20	20	100%	Bic Schneider Othello	45%	50%	70%
S_2	50	35	70%	Bic Schneider Parker	50%	70%	50%
O	100	15	15%	–	–	50%	20%
Total	620	405					

[a]Interviews and opinions used instead of questionnaires.

Source: Market Research.

TABLE 7

TOTAL NUMBER OF BALL-POINT PENS HELD AT ONE TIME IN EACH MARKET SEGMENT

MARKET SEGMENT	(1) Average No. of Pens Held at One Time	(2) Sector Universe (000)	(3) % of Universe Using the Product	(4) Total No. of Pens Held at one time (000) (1 x 2 x 3)
S_1	3	165	94	465
P	2	200	40	160
C	3	55	100	165
G	2.5	20	100	50
S_2	2	100	70	140
O	1	1800	15	270
Total		2340		1250

Source: Market Research.

Market Share

The share of the plant of the total market is affected
by the price of competing products, the price listed by the firm,
the buying habits of consumers, promotional medias, and
distribution facilities. Another research study was conducted
for this purpose aiming at knowing the competing products and the
price at which they are sold in the wholesale and retail field.
The method through which this study was conducted is explained in
the Appendix. The findings are shown in Tables VIII, IX, X, and
XI.

Tables VIII and X show the first and second quality
brands existing in the market with their respective wholesale and
retail prices, mark-up and agent or wholesaler cost. Table IX
and XI give the same results as the previous tables after a tax
increase of 20 percent and a possible retaliation of 10 percent
on the part of the agent. Moreover, Tables IX and XI show the
new percentage mark-up assuming the final price to the consumer
remaining constant and the new price to the consumer, the mark-up
remaining the same.

Pricing the Product

The locally manufactured product would be the same
quality as Bio and Schneider which are used and preferred by most

consumers as could be noticed in column 4 of Table VI.

The uniform retail price to be set for the unibloc type must

be LL.0.25, thus coming between the retail price of its

direct competitors selling actually at P.L. 20 and P.L. 30.

The firm could set a lower price for the consumer, but, by

doing that, it would indirectly enter into the low quality

market which accounts for only 20 percent of the total, thus

decreasing its sales potential and its margin of profit.

Moreover, by setting a relatively high price, the firm would

have the possibility of leaving a higher mark-up for both

retailers and wholesalers, thus encouraging them to sell the

product.

Table XII shows the price and the mark-up for middle-

men at different marketing stages. Comparing the findings in

Tables VIII and X before a possible tax increase of 20 percent,[1] and assuming a uniform wholesale mark-up of 20 percent,[2] it can be noticed that the mark-up to both marketing agencies is quite satisfactory. Comparing figures in Tables IX and XI obtained after a tax increase and a possible retaliation of 10 percent[3] on cost on the part of wholesalers, the range profit left, assuming a constant retail price, will decrease, thus offering the firm an advantage over its direct competitors. If the initial mark-up is going to be retained, the price to both the retailer and consumer has to be increased, thus giving a second advantage.

Sales Potentials

The Local Market Share

The data obtained in the market research shows that direct competitors have no advantage regarding the sales price, but they have a disadvantage in distribution facilities in relation to the low mark-up left to marketing agents especially if prices are going to

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[1] Policy followed by Ministry of Economy to increase taxes and import duties when a new industry is established.

[2] According to wholesalers interviews.

[3] The wholesaler, or agent, faced with a tax increase, has either to increase the price or retaliate (decrease the profit margin) so that the price and sales volume remain constant.

remain as they were before the tax increase. Moreover, consumers'
buying habits offer a great possibility of penetration in the market
since the consistency of brand use ranges between 35 percent and
50 percent only.[1] Many consumers do not buy the commodity themselves
but receive it free from advertising agencies or from the office
where they work. This group forms a percentage varying from 20 to
95 percent according to the market segment where they are located.[2]

All these factors tend to support the hypothesis that such
a product will take at least 50 percent of the total Lebanese market,
especially when active promotional medias are used. The amount of
advertising costs would be set later in the cost study.

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[1]From Table VI, column 3.

[2]From Table VI, column 7.

TABLE 8

FIRST QUALITY BRANDS EXISTING IN THE MARKET
WITH THEIR RESPECTIVE WHOLESALE AND RETAIL
PRICE, MARK-UP, AND AGENT COST

BRAND	(1) Wholesale Price P.L.	(2) Retail Price P.L.	(3) Mark-up P.L.	(4) % Mark-up on Wholesale Price	(5) Wholesaler Cost Assuming Average 20% Mark-up P.L.
Schneider	24	30	6	25	20
Bic	14	20	6	43	12
Staedtler	21	25	4	17	18
Faber	20	25	5	25	17
Othello	21	25	4	17	18
Krause	24	30	6	25	20

Source: Market research.

TABLE 9

FIRST QUALITY BRANDS EXISTING IN THE MARKET
WITH THEIR RESPECTIVE WHOLESALE AND RETAIL
PRICES, MARK-UP AND AGENT COST AFTER A TAX
INCREASE OF 20% AND
A POSSIBLE RETALIATION OF 10%

BRAND	(1) Agent On Wholesaler Cost	(2) Wholesaler Cost After 20% Tax Increase	(3) New Wholesale Price After Possible Retaliation of 10%	(4) % New Mark-up Retail Price the same	(5) New Retail Price Mark-up the same
	P.L.	P.L.	P.L.		P.L.
Schneider	20	24	26	15	32.5
Bic	12	14	15	33	21.5
Staedtler	18	21	22.5	11	29.0
Faber	17	20	21.5	16	26.8
Othello	18	21	22.5	11	26.3
Krauss	20	24	26	15	32.5

Source: Market research.

TABLE 10

SECOND QUALITY BRANDS EXISTING IN THE MARKET
WITH THEIR RESPECTIVE WHOLESALE AND RETAIL
PRICES, MARK-UP AND AGENT COST

BRAND	(1) Whole-sale Price P.L.	(2) Retail Price P.L.	(3) Mark-up P.L.	(4) % Mark--up On Whole-sale Price	(5) Wholesale Cost Assuming Average 20% Mark-up P.L.
Lyretta[a]	17	25	8	46	14
Lucky	6.5	15	8.5	130	5.5
Universal	8	10	2	20	6.5
Punta	10	15	5	50	8.5
Unix	15	25	10	66	12
BO[a]	15	25	10	66	12
Bobbel	7.5	15	7.5	100	6.5
No Brand	10	15	5	50	8.5
Styloo	9	15	6	66	7.5

[a]Retractable type.

Source: Market research.

TABLE 11

SECOND QUALITY BRANDS EXISTING IN THE MARKET
WITH THEIR RESPECTIVE WHOLESALE AND RETAIL
PRICES, MARK-UP AND WHOLESALER COST AFTER
A TAX INCREASE OF 20% AND A POSSIBLE
RETALIATION OF 10%

BRAND	(1) Agent On Wholesaler Cost P.L.	(2) Wholesaler Cost After 20% Tax Increase P.L.	(3) New Wholesale Price After Possible Retaliation of 10% P.L.	(4) % New Mark-up Retail the same	(5) New Retail Price Mark-up the same P.L.
Lyretta[a]	14.0	17	18.5	35	27.0
Lucky	5.5	6.5	7.0	114	16.1
Universal	6.5	8	9.25	38	11.1
Punta	8.5	10	10.75	39	16.1
Unix	12.0	15	16.5	51	27.3
BO[a]	12.0	15	16.5	51	27.3
Bobbel	6.5	7.5	8.0	87	16.0
No Brand	8.5	10.0	10.75	39	16.1
Stylco	7.5	9.0	9.75	54	16.2

[a]Retractable type.

Source: Market research.

TABLE 12

PRODUCT PRICES OF THE FIRM

TYPE	Wholesaler P.L.	Retailer P.L.	Consumer P.L.	Wholesaler Mark-up %	Retailer Mark-up %
Unibloc	15	19	25	27	31
Retractable	20	25	35	25	40

As a conclusion, it can be stated that at these prices the firm will have a 50 percent share of the market which accounts for approximately 2,000,000 units per year, the total consumption being 4,166,000.[1]

C. Other Markets

Other markets are available for the ball-point pen industry, namely, the advertising market and the foreign market.

The advertising market includes those firms which use ball-point pens as promotional media. Interviews were made with some firms using such policy and with advertising agencies to determine the potentials of this market. The sales were estimated to range around 500,000 pens per year since the firm

[1]From Table VII, column 4.

has no competitors in this area.

The foreign market is very restricted since the ball-point pen industry exists in some countries of the Middle East such as Syria and the United Arab Republic. Exports could be made at very competitive prices only to countries like Jordan, Iraq, Kuwait, Saudi Arabia, and a few African countries. Such market could only compensate for possible deviations in the total sales estimates and the market share. Thus, more conservative figures could be obtained.

The export market could be increased under very competitive prices after the plant break even, thus being able to sell at variable costs plus a slight margin of profit. This situation will be explained fully in the cost analysis in Chapter V.

TABLE 13

TOTAL SALES POTENTIALS

	(000) Units	(000 L.L.) Sales Volume 15 P.L. Per Unit
Share of Local Market	2,000	300
Advertising Market	500	45
Total	2,500	345

Demand Elasticity

Demand elasticity measures the sensitivity of sales to changes in one or several factors affecting the demand schedule. It is the percentage increase in sales due to the same percentage increase in any demand determinants.[1] For most consumers' goods, three kinds of demand elasticities are accounted for, namely, price, income, and promotional elasticity.[2] Since ball-point pens are sold at low prices and they can be afforded by all potential consumers regardless of their income level, income elasticity of demand does not have the same effect as on other consumers goods. Thus, the most important types of elasticities are the price and promotional elasticity. The plant having not been established yet, it is difficult to measure the demand elasticity for the product because no measure of the consumers responsiveness can be known before they are faced with the goods in a tangible way. In the future, knowing the demand elasticity for each determinant, policies regarding pricing and advertising will be revised in order to determine maximum profits for the entrepreneur.

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[1] Joel Dean, Managerial Economics, (Englewood Cliffs: Prentice-Hall, Inc., 1961) p. 161.

[2] Ibid.

Distribution Problem

To arrive at a market share of 50 percent, the firm will probably face a distribution problem which can be solved by adopting three distribution channels, namely, to wholesalers, to retailers and direct to consumers.

The wholesalers dealing with ball-point pens are concentrated in Beirut and some of the large towns of Lebanon, such as Tripoli, Saida, and Zahlé. These marketing middlemen buy usually in lots varying between 500 and 2,000 pens. They are concentrated in the commercial zone which renders the distribution process easier and less costly.

Retailers on the contrary are spread throughout the whole country and they buy in lots varying from one to five dozens, thus creating a distribution problem. This can be solved by establishing in each region a distribution center. These centers will be located in libraries or other shops and will act as distributors for the region. The pen will be sold by these regional agents at the wholesale price of 15 and 20 piasters respectively for the unibloc and retractable types. These centers will handle pens either on their own account or on a consignment basis, and they will be responsible for sales in the area.

The third channel of distribution is to sell directly
to consumers in market segments where there is the highest
concentration of buyers such as the commercial, government, and
secondary schools segments, where 10.2 percent of the total
potential consumers account for 67.4 percent of the total market.[1]
Direct selling can be made in several ways according to the buying
habits in each sector. In secondary schools having more than one
thousand students, vending machines can be established. In
government services and large companies, annual bids at
competitive prices can be made since middlemen profits are
eliminated.

The distribution costs are accounted for in Chapter IV
by including them in the variable costs. The distribution
schedule would be in the following form:

Factory ⟶ Wholesalers ⟶ Retailers ⟶ Consumers

Regional Distributors
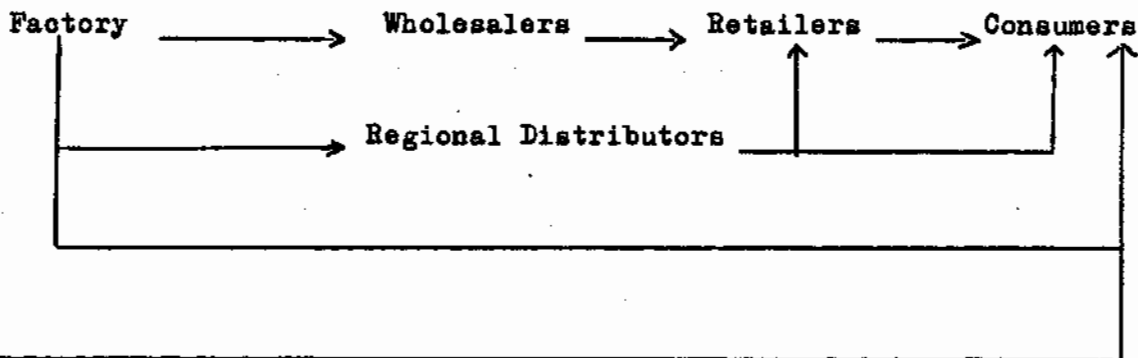
[1]From Table V, columns 5 and 6.

CHAPTER IV

TECHNICAL STUDY

The project aims at establishing a plant producing ball-point pens of two main types, the unibloc type and the retractable type. The technical study will outline the steps of production, the type and number of machines required, the raw material needed, the disposition and layout of the plant, and the technical assistance in production in order to give a general idea of the nature of the ball-point pen industry.

The fabrication of both unibloc and retractable types requires three main steps of production, namely, the manufacturing of points and refills, the production of the plastic body, and finally, the assembling, printing and packing of the finished item for distribution.

System of Production

The steps necessary to produce the ball-point pen in its final form will be enumerated in this section. Explanation about the functioning of the machines, the nature of products to be used, after each consecutive step, the measures of control,

will not be explained because they need a deep engineering study
and thus lie beyond the scope of the research.

The system of production to be followed is used in
most well-known plants producing ball-point pens in Europe.
This system was suggested and studied by one of these plants
specialising in the production of ball-point pen machines.

Production of Complete Refills

The production of complete refills requires two
separate steps, the production of points and the production
of refills. Eleven operations are required for this
purpose:

(1) Production of conical or cylindrical blanks.

(2) Cleaning of the blanks.

(3) Microscopic control of the blanks.

(4) Production of the ball-point.

(5) Installing the ball-point in the blank.

(6) Microscopic control of step five.

(7) Tube cutting.

(8) Collar forming.

(9) Ink injection.

(10) Centrifuging.

(11) Refills testing.

The production of complete refills constitutes the most important step in the whole system of production because of the high degree of precision required, especially in the production of the ball-point. The complete refills are used in both "unibloc" and "retractable" types. The only difference in the production of the two types arises in the second main step, that of the plastic body manufacturing.

. Production of Plastic Bodies

The production of the plastic body requires two main steps for the unibloc type, the production of the body, and the production of the cap. For the retractable type, an additional step is required, that of producing the plug.

. Assembling, Printing, and Packing

Now that the two main constituents of the ball-point pen are ready, three operations are required before the product is ready for consumption: assembling the complete refills with the retractable or unibloc bodies, printing the brand and other devices, and finally, packing the production to be ready for distribution.

Machines Required

The machines required for the complete production of ball-point pens have an output capacity of six million units per year. This set of machinery permits to follow a system of chain production, thus decreasing the costs of manufacturing, but it has the disadvantage of working under capacity because of limited market potentials. Another system which is not technically up-to-date could be used if the entrepreneur prefers to work at full capacity, but it is not advisable to install obsolete machinery which increases the cost of production. The final cost of production under both systems would be nearly the same under the actual market potentials, but the first one would have the advantage to be technically superior and more flexible to the market demand.

Disposition and Layout of the Plant

The division of the plant and the disposition of the machines can be visualised in Plan I in the Appendix. According to this Plan, the plant can double the initial production of 6 million units per year without creating any space problem and by working the same hours per day.

The production of refils and points, and the fabrication of plastics must be separated if a rationally organised production is to result. It is mainly for that reason that they have been put respectively on the left and on the right of the assembling hall.

According to the plan, room A is reserved for the production of the complete refills. This room will accommodate two tube cutting machines, two to three machines for ink injection and stop springs manufacturing, two centrifuge machines, two to four machines for points production, one degreasing machine, and a control table separating points' production from refills' production.

Room A_1 will be reserved for the storage of raw materials used in the manufacturing of points and refills such as brass or plastic tubes, ink, balls, oil, and other liquids for washing and degreasing.

The production of plastics such as bodies, plastic tubes for refills will be done in room B. In this room, we can install one machine for plastic bodies' production, two machines for plastic tubes production, one oven, and the shelves for the layout of moulds.

Raw materials used in the production of plastics such as polystyrene and Luran 52 will be stored in room B_1. The finished refills, points, plastic tubes, and bodies will be stored in room C.

The central room D is reserved for assembling finished complete refills with finished plastic bodies. In this room, provision was made for the installation of these assembling machines, and for one printing machine.

Finished pens are stored in room E ready for distribution. Room F is reserved for the personnel and for hygienic installations. Compressors are installed in room G so as to be isolated from other rooms for noise and vibration purposes. In the future, room H could be used as a repair shop or for any future need for enlargement.

Technical Assistance

The plant aims at producing a high-quality brand capable of competing with foreign products existing already in the market. To ensure the desired standard, a great care must be given to precision in each successive step of manufacturing Thus, the entrepreneur who invests in such a project is conf

with technical problems which might not be in his specialisation
field, especially if he is not a technician. Moreover, since a
ball-point pen industry does not exist in Lebanon, specialised
technicians capable of ensuring the desired objective are not
available, thus acting as a handicap from the technical side of
the project.

To solve this important problem, which might arise,
an agreement can be made with the compaåy supplying the machines
for technical aid and assistance during the early stages of
production. Such an agreement is available in two forms.

Agreement Form One

The company will send an expert for a period of two
years to supervise production, to instruct the personnel, and
to supply information about up-to-date methods followed in the
ball-point pen industry. Moreover, the expert guarantees a
minimum production of 24,000 refills per day in 8 hours work.
The quality is also guaranteed to be in conformity with
European standards.

The costs incurred by the entrepreneur under such an
agreement would amount to LL.15,000 per year for the expert's
salary, and a payment of LL.2.5 for each thousand units
produced to the company as fees.

Agreement Form Two

The company will send for a period of six months, an expert who will supervise the production only. The costs incurred would be the payment of LL.2,500 per month as a salary.

Signing one of the above agreement eliminates the risks incurred by employing unspecialised labour and ensures a product of quality. The extra costs incurred due to the technical assistance will be accounted for in the study on the costs of production.

CHAPTER V

COST STUDY

The cost study of this project will include a computation
of the total costs that must be incurred in establishing the plant
and starting production, anaanalysis of the costs of units of
production and a break even analysis based on costs findings.

Costs of the Project

The total costs of the project or the investment required
to establish the plant and start production are, like in any other
project, composed of two main parts: the costs incurred in the
purchase of assets such as machines, land, buildings, and equipment,
and the working capital necessary for operations.

Cost of Assets

Cost of Machines — The total cost of machines required
will amount to LL.280,000.[1]   The cost of spare parts needed were
included in cost computations.   Table XIV shows the cost of

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[1]Refer to Appendix, pp. 89-90.

machines needed for each step of production.

TABLE 14

TOTAL COST OF MACHINES

	(LL.)
Point Production	93,800
Refills production	42,000
Bodies production	78,300
Other machines	42,200
Spare parts	10,000
Total	266,300
Machines setting cost (5% of total cost)	13,700
Total costs of machines	280,000

Land and Building Costs

The plant will be located preferably in the industrial zone north of the city of Beirut, where most of the consumers are located and where it is easier to find the necessary labour force, at relatively cheaper prices, since most industrial workers are living nearby.

According to the plan of the plant,[1] the project requires 1,000 m^2 of land on which the building will

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[1] Refer to Appendix, Plan III, p.103

occupy an area of 700 m^2. The price of one square meter
of land in the industrial zone varies between LL.50 and
LL.120

Since the nature of the industry does not dictate
a special location in that zone, the entrepreneur could
easily buy the square meter for around LL.70. Thus, the
cost of land would amount to LL.70,000.

The area of the building would be around 700 m^2 as
it can be seen in Plan III in the Appendix. The average
cost of one square meter of built area for industrial
purposes varies between LL.80 to LL.90, including sanitary,
electrical, and all other costs. Thus, the costs of
building the plant would amount to LL.60,000 approximately.

The total costs of assets would amount to:

	(LL.)
Cost of machines	280,000
Cost of land	70,000
Cost of buildings	60,000
Other Costs[1]	40,000
Total costs of assets	450,000

[1]Includes the cost of fixtures and furnitures
with other costs in distribution assets. (Trucks)

Working Capital

Like in every business, a working capital is needed
to finance operations. In the ball-point pen industry, the
working capital is needed to finance the purchase of raw
materials, sales, labour costs, overhead costs, and
miscellaneous costs. Since the nature of the industry does
not require a long process of manufacturing, and since the
cost of raw materials does not exceed LL.120,000 for a yearly
production of 4 million units, the working capital needed
would not exceed LL.100,000.[1]

Summarising, the investment necessary to establish
the plant and start production would be:

	(LL.)
Total Costs of Assets	450,000
Working Capital	100,000
Total Investment	550,000

Costs of Units of Production

In order to compute the cost of producing a ball-point
pen, some assumptions must be made about the volume of production
and about the life of the depreciating assets. The plant is
capable of producing six million units per year, but, according

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[1]Refer to Appendix, p.

to the findings of the market survey (Capter III), the total
yearly production would be in the order of four million units
per year, because of limited sales potentials. The life of the
machines would be estimated at five years, thus, they would be
completely depreciated after a total volume of production of
20 million units.

For buildings and other assets, assume a flat rate of
depreciation of 6 percent per year. In this respect, the rates
adopted with depreciation do not conform with the Lebanese
depreciation regulations, which do not allow such a fast rate.
However, a fast rate of depreciation is used here because these
rates are generally followed in the ball-point pen industry in
Europe. Moreover, a fast rate of depreciation will not over-
estimate profits, which might give an unrealistic figure to the
entrepreneur who wants to invest in such a project.

Production Costs of a Unibloo Pen with Conical Point

	(LL.)
Cost of points only	0.01760
Cost of refills only	0.01470
Cost of body	0.02610
Amortisation on rest of machinery	0.00210
Depreciation on rest of assets	0.00250
Assembling cost	0.00375
Technical Assistance cost	0.00125
Total	0.06800

Production Cost of a Unibloo Pen with Cylindrical Point

		(LL.)
	Cost of a Unibloo conical peint pen	0.0680
Less	Difference in Point cost	0.0022
	Total	0.0658

. Production Cost of a Retractable Pen

	Conical (LL.)	Cylindrical (LL.)
Cost of a Unibloo Pen	0.06800	0.06580
Difference in body cost	0.00350	0.00350
Total	0.07150	0.06930

These final costs of production could be summarised in the following table.

TABLE 15

PRODUCTION COSTS PER UNIT

	Conical Point (in LL.)	Cylindrical Point (in LL.)
Unibloo	0.0680	0.0658
Retractable	0.07150	0.0693

Source: Cost Analysis.

Break even Analysis

A break even analysis is a practical application of cost studies. It explains the short run relations of total cost and total revenue to the rate of output and gives flexible projections of the impact of output rate upon expenses, receipts and profits.[1] In drawing the break even chart for ball-point pen production, assume like in all break even analysis that the total cost function is drawn on the basis of constant factor prices, plant scale, technology and efficiency; and that the total revenue function assumes constant selling prices.[2]

Fixed and Variable Costs

The break even chart equates two functions: the total cost function and the total revenue function. The total cost function is composed of two main types of costs: variable costs and fixed costs. The total revenue function is the total volume of sales expected.

Variable costs are those costs that are a function of output. The costs of raw materials constitute the main part of variable costs. Overhead costs are composed of some

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[1]Joel Dean, Managerial Economics, Englewood Cliffs: Prentice-Hall, Inc., 1961), p. 326.

[2]Ibid.

fixed costs and some costs that are variable in nature.
The writer tended to assume 60 percent of overhead costs as
fixed costs; while accountants consider them as a mixture
of both fixed and variable costs.[1]

The fixed costs in relation to this project are
depreciation costs of buildings, machines and other assets,
labour costs, and a 40 percent of overhead costs. The fixed
costs would amount to:

Depreciation Costs	(LL.)	(LL.)
Buildings and other assets	4,800	68,800
Machines	64,000	
Labour Costs		50,000
Overhead Costs (60%)		31,500
Total Fixed Costs		150,300

Variable Costs for an Output of 4 million Units

Raw Material Costs[2]

Brass	14,500	
Balls	5,600	
Ink	28,400	
Plastic for refills	4,000	
Plastic for bodies	52,000	104,500
Overhead Costs (40%)		21,000
Advertising and distribution costs		45,000
Total variable Costs		170,000

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[1]Spencer and Siegleman, Managerial Economics,
Decision Making and Forward Planning, (Homewood, Illinois,
Irwin, Inc., 1959), p. 236.

[2]Computations were done according to a 20%
production of retractable type and 80% of unibloc type.

Break even for Different Combinations of Output and Price

Knowing the figures for the two main components of the total cost function, break even computations can be done according to different combinations of levels of production and sales prices per unit by applying the formula:

$$\text{Break even} = \frac{\text{Contribution at the margin}}{\text{Fixed Costs}}$$

Table XVI shows the break even results for these different combinations. Table XVII gives the profit or loss expected according to the same combinations assuming that the entire production is sold. Table XVIII indicates the profits resulting from the sale of the market share[1] of the plant in relation to the total market potentials at different levels of prices, assuming a total production of 4 million units per year.[2] Assuming a local market share of 2.5 million units per year, that the balance is exported at variable costs of LL.4.25 per unit, and a local sale price of LL.0.15 per unit, the profits would amount to LL.124,000 per year.[3]

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[1] Refer to Demand Analysis, p. 37.

[2] Assuming that the balance 1.5 million is sold for export at variable costs only, that is, P.L.4.25 per unit.

[3] Refer to Table XVII.

TABLE 16

BREAK EVEN COMPUTATIONS FOR DIFFERENT
COMBINATIONS OF OUTPUT VOLUME AND
SALES PRICE PER UNIT

(1) UNITS PRODUCED (000) 	(2) Sales Price P.L.	(3) Variable Costs (000) L.L.	(4) Variable Cost Per Unit P.L.	(5) Fixed Costs (000) L.L.	(6) Unit Compensation of fixed Costs (2 - 4) P.L.	(7) Break Even Units (000) 5/4
2000	10	85	4.25	150	5.75	2.608
2000	12	85	4.25	150	7.75	1.935
2000	15	85	4.25	150	10.75	1.395
3000	10	127.5	4.25	150	5.75	2.608
3000	12	127.5	4.25	150	7.75	1.935
3000	15	127.5	4.25	150	10.75	1.395
4000	10	170	4.25	150	5.75	2.608
4000	12	170	4.25	150	7.75	1.935
5000	10	212.5	4.25	150	5.75	2.608
5000	12	212.5	4.25	150	7.75	1.935
6000	10	255	4.25	150	5.75	2.608
4000	15	170	4.25	150	10.75	1.395

Source: Break even and Cost Analysis

TABLE 17

PROFIT AND LOSS FOR DIFFERENT COMBINATIONS
OF OUTPUT AND PRICE

(1) UNITS PRODUCED (000)	(2) Sales Price P.L.	(3) Total Cost (000) L.L.	(4) Sales Volume (000) L.L.	(5) Break Even Units (000)	(6) Break even Volume (000) L.L. 2 x 5	(7) Profit (000) L.L. 4 - 3
2000	10	235.0	200	2.608	260.8	(35) Loss
2000	12	235.0	240	1.935	232.2	5.0
2000	15	235.0	300	1.395	209.2	65.0
3000	10	277.5	300	2.608	260.8	22.5
3000	12	277.5	360	1.935	232.2	82.5
3000	15	277.5	450	1.395	209.2	172.5
4000	10	320.0	400	2.608	260.8	80.0
4000	12	320.0	480	1.935	232.2	160.0
4000	15	320.0	600	1.395	209.2	280.0
5000	10	362.5	500	2.608	260.8	137.5
5000	12	362.5	600	1.935	232.2	237.5
6000	10	404.5	600	2.608	260.8	195.5

Source: Break even and Cost Analysis.

TABLE 18

PROFITS AND LOSS FOR DIFFERENT SALES PRICES
FOR A VOLUME OF SALES OF 2.5 MILLION UNITS

(1) UNITS PRODUCED (000)	(2) Sales Price P.L.	(3) Share of Market Potential Units (000)	(4) Volume of Sales (000) LL. 2 x 3	(5) Total Costs of 2½ mill. Units (000) LL.	(6) Profits (000) LL.
4000	15	2,500	375	251	124
4000	12	2,500	300	251	49
4000	10	2,500	250	251	1 loss

Source: Demand and Cost Analysis

Managerial Usefulness of the Analysis

By introducing correlation analysis, we can build a set of relations between the various elements of cost and the rate of output in the following form.

$$Q = ax - \left(\frac{xr}{b + ox} + (d + ox)f + (g + hx) + i \right) \quad I$$

where:

Q = Profits.

a = Average sales price per unit.

x = Volume of output.

b + ox = Productivity.

r = Wage rate.

d + ox = Physical volume of purchases.

f = Price of raw materials and services.

g + hx = Depreciation and depletion.

i = Taxes and interest.

Using this function, the manager can answer a variety of questions such as:[1]

a) What sales volume will be necessary to maintain a given profit level when costs or prices change?

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[1]Joel Dean, Managerial Economics, (Englewood Cliffs: Prentice-Hall, Inc., 1961), p. 339.

b) What productivity gain will be needed to maintain
   profits with rising wages and constant prices?

c) What would be the effects on profits of a change in
   prices of purchased materials, sales volume, varying
   or remaining constant?

The following example based on the data obtained
in the cost analysis answers the first question enumerated
previously. Suppose that an entrepreneur wants a net rate
of 15 percent on his investment. This means that he wants
on this project, which total costs amount to LL.550,000, an
amount of profits equal to LL.75,000 per year. The sales
volume necessary to give him that profit will be found by
replacing, in the following formula, the corresponding data
obtained in the cost analysis.

$$Q = ax - \frac{xr}{b + cx} + (d + cx)f + (g + hx) + i$$

$$ax = Q + \frac{xr}{cx} + (d + cx)f + (g + hx) + i$$

$$ax = 75,000 + 35,000 + (104,500 + 97,500) + 60,800 + 42,500[1]$$

$$ax = LL.415,000$$

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[1]The rate of interest being 7.7% on LL.550,000,
refer to financial analysis under the cost of capital
section.

Knowing the sales volume necessary to produce net profits of LL.75,000, the entrepreneur can set the price of units of production according to the market potentials. In reality, there is an infinite number of combinations of price and quantity sold that satisfy the entrepreneur's wish for profit. That is, for each amount of profit, there is one set of combinations of price and quantity represented by an indifference curve.

Limitations

The main limitation of break even analysis is the empirical determination of the cost and revenue curves. In the analysis, the writer determined the cost and revenue curves by the short hand method, used generally for practical purposes. Other limitations are caused by possible errors in the measurement of costs.

CHAPTER VI

FINANCIAL STUDY

In order that the entrepreneur decides about the
feasibility of this project, a financial study is needed to determine
the measuring sticks on which he has to rely in taking his decision.
This chapter will include a computation of the rate of return and the
cost of capital based on the data obtained in the demand analysis and
the cost study, an analysis of the methods of raising funds, and a
comparison of the results for this particular project with other
alternatives in different sectors of the economy. The computations
will be done for a sales volume of 2.5 million units and a respective
sale price of 15 and 12 P.L. which are the most likely situations
under which the firm will operate respectively for a normal situation
and that where dumping is introduced in the market.

The Rate of Return

The rate of return and the cost of capital are the most
important tools on which the investor in any project relies to
determine its feasibility. There are several conceptions of the
rate of return which must be outlined before stating the final

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definition on which the computations regarding this project will
be based.

Definition of the Rate of Return

The precise definition of the rate of return on any
investment is "that rate which equates the present value of
the cash receipts expected to flow from the investment over
its lifetime with the present value of all expenditures
relating to the investment."[1] A simplified version of the
rate of return is reached after stating certain assumptions
which do not distort the rate of return concept.[2] These
assumptions are

a) No future outlays are required.

b) The cash flow is uniform.

c) The salvage value is ignored. For this purpose, the
cost incurred in long lived assets such as buildings
and land will not be accounted for in computations as
part of the investment but as assets on which rent is
paid.[3]

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[1]Spencer and Siegleman, Managerial Economics,
Decision Making and forward Planning, (Homewood, Illinois:
Irwin, Inc., 1959), p. 135.

[2]Ibid., p. 388

[3]Rent is not considered as a future outlay.

This simplified version is expressed in the following equation:

$$I = \frac{U}{r} - \frac{U}{r} \left(\frac{1}{1+r} \right)^n$$

that is "for an investment, I, from which it is estimated that there will be a uniform cash flow of U, the true rate of return on that investment is the value of r which will equate the total cash flow with the investment outlay,[1] that is:

$$r = \frac{U}{I} - \frac{U}{I} \left(\frac{1}{1+r} \right)^n$$

The Rate of Return on the Project

Substituting the data obtained previously in the Demand and Cost Analysis in the equation:

$$I = \frac{U}{r} - \frac{U}{r} \left(\frac{1}{1+r} \right)^n$$

$$420,000 = \frac{175,000}{0.35} - \frac{175,000}{0.35} \left(\frac{1}{1.35} \right)^5$$

$$420,000 = 500,000 - 500,000 \left(\frac{1}{6.04} \right)$$

$$420,000 = 500,000 - 83,000$$

$$420,000 = 417,00$$

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[1] Ibid.

Thus, the rate of return will be 35 percent, assuming the firm is exempted from income tax.

Rate of return if the firm pays taxes

$$I = \frac{U}{r} - \frac{U}{r} \left(\frac{1}{1 + r} \right)^n$$

$I = 420,000$

$U^1 = 154,000$

Substituting the equation

$$420,000 = \frac{154,000}{0.27} - \frac{154,000}{0.27} \left(\frac{1}{4.1} \right)^5$$

$$420,000 = 570,000 - \frac{570,000}{4.1}$$

$$420,000 = 570,000 - 140,000$$

$$420,000 = 430,000$$

Thus, the rate of return would be 27 percent.

_____

[1]Refer to Appendix, p. 95.

Estimation of the Rate of Return

Since the study done on this project was
approximative, an estimate of the rate of return could be
used for simplification. The best estimation for the rate
of return is the payout reciprocal U/I where, U, is the
uniform cash flow and, I, the investment outlay.[1] Generally,
the payout reciprocal is an exact measure in case of a
project having an infinite life, and a satisfactory estimate
of the rate of return where the project life is substantially
greater than the payout period or at least the double of it,
so that the error of estimate could be ignored.[2] For this
particular project, the payout period is 2.4[3] and its life
is five years, therefore, the approximate rate of return
could not be used in the computations of the measuring sticks.

Thus, the rate of return estimate would be:

$$\frac{1}{2.4} = 41.5\%$$

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[1]Spencer and Siegleman, *Managerial Economics*,
p. 389.

[2]*Ibid.*, p. 390.

[3]Refer to payout period computations, p. 68.

The Payout Period

The payout period is a short-out method generally used by businessmen as a measuring stick for their capital outlays. This method determines the time required for the cash earnings on a given investment to return the original costs incurred.[1] The payout period, P, is expressed as:

$$P = I/E$$

where I, represents the original investment and, E, the average annual cash flow.

Substituting the data obtained in the cost study in Chapter IV,

$$P = \frac{320,000 + 100,000}{175,000} - \frac{420,000}{175,000} = 2.4$$

Other Measuring Sticks

When the rate of return and the cost of capital are unknown to the entrepreneur, other measuring sticks are computed to help in taking a decision. These yardsticks are the capital recovery period and the annual cost, which give the same result as the payout period, but by taking account of the time value of money which is interest.

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[1]Refer to Appendix, p. 95. Determination of Cash Flow.

The capital recovery period and the annual cost for this project
are shown in Tables XIX and XX, respectively, for the sale price
of 15 and 12 P.L.[1] Since the rate of return and cost of capital
were computed, the capital recovery and annual cost will only
help in comparing the figures for the payout period when the time
value of money is accounted for or not.

Tables XIX and XX are a summary of the various
measuring sticks respectively for a sale price of 15 and 12 P.L.
In these tables, the entrepreneur will notice the difference
between the rate of return and its estimate which is the
reciprocal of the payout period, and the difference between the
payout period when the time value of money is, and is not
considered.

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[1]Refer to Appendix, pp. 96   for computations.

TABLE 19

SUMMARY OF THE DIFFERENT MEASURING STICKS
FOR THE SALE PRICE OF 15 P.L. PER UNIT

	Income Tax is Paid	Income Tax Not Paid
Rate of return	27%	35%
Payout period	3.02	2.37
Capital recovery period	3.2	2.6
Annual cost	91,500	91,500
Reciprocal of payout period	33.1%	42.5%

Source: Financial Analysis.

TABLE 20

SUMMARY OF THE DIFFERENT MEASURING STICKS
FOR THE SALE PRICE OF 12 P.L. PER UNIT

	Income Tax Is Paid	Income Tax Not Paid
Rate of return	11%	11.5%
Payout period	4.34	4.2
Capital recovery period	6.0	5.2
Annual Cost	91,500	91,500
Reciprocal of payout period	23.0%	23.8%

Source: Financial Analysis.

Raising Funds

In Lebanon, the problem of raising funds is more difficult than in developed countries having developed money markets, and where firms can practice internal and external financing. The main source of debt funds for the entrepreneur has been and will remain for the short future the commercial banks. All banks, besides the BCAIF (Banque de Crédit Agricole Industriel et Financier) give mainly short term loans with high interest rates varying between 7 and 9 percent. For industrial investments, the BCAIF gives long term credit at the relatively low interest rate of 5.5 percent. The amount of the loan given rarely exceeds 30 percent of the total investment cost. Moreover, the potentials of the BCAIF are limited and demand for long term loans exceeds by far its possibility.

The only choice left to the entrepreneur, besides the BCAIF, is the commercial banks who usually give short term credit on mortgage or guarantee basis, or by discounting notes. These notes usually mature in three months, but they are constantly renewed for a maximum period of five years.[1] But, according to the Lebanese tax system, every note is taxed 2°/oo which constitutes a very heavy burden on such operations; because, if

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[1] Pierre Nasrallah, "Le Crédit à Moyen Terme au Liban", (Beyrouth: Imprimerie Catholique, 1961), p. 144.

$2^o/oo$ is paid each three months, the total value paid at the end of five years would amount to 4 percent.[1] Such a formula for credit discourages the entrepreneur who does not have other alternatives.

For certain investments, the entrepreneur can find foreign sources of credit on a medium term basis to finance mostly the import of machinery. The machinery needed for the project will be financed by a special organisation in Switzerland on a medium term basis varying between 3 and 5 years at a rate of interest of 6.5 percent. The conditions for such an agreement are the presentation of a guarantee from a Lebanese bank and the buying of the whole equipment from the same company which will get in contact with that organisation. Since machines account for two-thirds of the total investment, such an agreement enables the entrepreneur to raise funds at medium terms for a substantial part of the total borrowed investment.[2] Thus, for this project, the entrepreneur could raise funds for 20 percent of the total investment from the BCAIF at 5.5 percent, 60 percent from foreign sources at 8.1 percent,[3] and the balance from commercial banks at 9 percent. The weighted rate of interest would amount to 7.7%.[4]

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[1] Ibid., p. 145.

[2] Considered to be LL.350,000.

[3] 6.5% of the initial rate of interest, plus 1.5% for the bank guarantee.

[4] (0.20 x 5.5%) + (0.60 x 8.0%) + (0.20 x 9.0%) = 7.7%.

Profitability of the Project

Having determined the rate of return, the payout period, the capital recovery period, and the annual cost for the project, the entrepreneur could now decide for the short run to invest or not, according to the other alternatives available to him. If the investor has other possibilities giving him a higher rate of retur, a lower payout or capital recovery period, he will drop the project. But, in taking his decision, the entrepreneur has to make certain considerations about the risk involved in each project proposal. Quantifying the risk involved differs with the entrepreneur and the values he gives for each risk determinant. For this reason, the risk involved has not been accounted for in this study and was left to the judgement of the investor.

The measuring sticks computed show that the project is profitable if the estimated sales volume in the demand analysis is reached. But these findings are not sufficient for the entrepreneur to convince him that this project would improve his earning power in the long run unless he knows the cost of capital on such investment and compares it with other proposals. Thus, the cost of capital to a firm provides the optimum acceptar criterion for projects proposals.[1]

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[1] Ibid., p. 402.

Cost of Capital

No general agreement has been reached about the precise meaning of the cost of capital concept, yet, it is generally accepted by the leading writers on this subject (i.e. Dean's and the Lutze's) that the cost of capital is the opportunity cost to the firm.[1] Others defined the cost of capital as "the cost of equity funds (measured by earning yields) when the firm has what the market considers to be a well-balanced capital structure.[2] But, the earnings yield and the capital structure differ with the investor according to his capacity, his credit standing, and the sector of the economy in which he is operating. Thus, if this definition of the cost of capital has to be used, its determination must be left to the judgment of the entrepreneur.

A further distinction is made in relation to opportunity cost by differentiating between a "lending rate" and a "borrowing rate.".[3] The lending rate is conceived to be the rate at which the entrepreneur can lend money at a certain rate of interest which is generally constant because the investment does not have an effect on the market.[4] The borrowing rate is conceived to be the rate at which the entrepreneur can borrow.[5] Since the entrepreneur can

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[1]Ibid., p. 408.

[2]Ibid., p. 409.

[3]Ibid., p. 403.

[4]Ibid.

[5]Ibid.

borrow money on medium term basis at the relatively low rate of
interest of 7.7 percent only by investing in that particular
project or in similar industrial alternatives enabling to raise
foreign sources of funds, the cost of capital for this particular
project will be considered to be the borrowing rate. Thus, the
cost of capital in this analysis would be 7.7 percent.[1]

Comparison with other Alternatives

Having determined both the rate of return and cost of
capital, a comparison with alternative investments can be made.
But there exists an infinite number of alternatives with an
infinite combination of costs of capital and rate of return
relating to them. These combinations differ with the sector of
the economy in which the investment is made and the capacity of
the entrepreneur. For these reasons, a quantitative comparison
with these alternatives will not be made, but a method of
comparison will be outlined to help the entrepreneur deciding
according to his particular alternatives.

A Method for Comparison with other Alternatives

From the list of project proposals available, the
entrepreneur will choose the one which gives the highest
increment percentage between the rate of return and the

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[1]Refer to the section on raising funds.

cost of capital, and not the project showing the highest
rate of return. This method of ranking investment
alternatives assumes that all other factors influencing
the entrepreneur's decision such as risks, payout, or
capital recovery period, capital invested, etc., are equal.
But, in reality, these factors are not equal and the
entrepreneur may decide to undertake a project giving a
lower increment percentage between the rate of return and
the cost of capital, if, in his opinion the risk or other
factors quantified accordingly will outweigh the profit
advantage.

In the Economy, there exists an infinite
combination of investment proposals in relation to all the
factors influencing the entrepreneur's decision, thus, a
comparative study of these combinations could not be made
quantitatively before knowing the combinations available to
the investor.

Therefore, knowing the influencing factors which
have been analysed in relation to this project, and those
related to other proposals, the entrepreneur could reach a
decision according to the relative values given to these
factors.

CONCLUSION

From the findings in the demand, cost, and financial
analysis, a conclusion can be stated about the feasibilty of
establishing a ball-point pen factory. Such an opinion is
formulated in relation to the assumptions stated in the study
according to several combinations of sales volume and price on which
the measuring sticks computations were based.

Generally speaking, and assuming other things to be equal[1]
a project is feasible if profits are left to the entrepreneur. Two
assumptions were considered in the study in relation to the market
share of the firm under the sales prices of 15 and 12 P.L.
Computations were made in relation to these combinations which were
estimated to be the most probable situations under which the firm
will operate. The findings show that under a sales volume of
2.5 million per year, the project is profitable under both prices.
But, with a sales volume of 1.5 million per year, the project is
only profitable for the selling price of 15 P.L. per unit. Since
the plant will most likely operate under a sales volume ranging
around 50 percent of the local market, it can be concluded that the

[1]That is, the other alternatives available to the
entrepreneur and the risk involved.

project is profitable, and thus, feasible.

But, for whom is this project feasible? Is it for any
entrepreneur who can raise the necessary funds for such an
investment? Surely no, because, as it has been stated in the
financial analysis, an entrepreneur decides in undertaking or
leaving an investment proposal only when it increases his rate of
return on his total investments, under a well-balanced capital
structure, more than other proposals.

Since an infinite combination of the conditions required
for deciding upon a project proposal is available in the different
sectors of the economy, it could not be concluded that this project,
or another one, is a feasible investment under any combination.
But it would be very conservative to state that such a proposal is
feasible for a number of concerns according to the relative values
they give to the results found in the study and that given for
alternative opportunities.

Moreover, it has been stated previously that approximately
LL.1,000 million must be invested in the industrial sector between
1960 and 1975 to achieve a well-balanced economic structure under a
rate of growth of 5.3 percent. Since the Lebanese market is

restricted so as to permit a development of large existing industries,
new investments required for the development of that sector have to be
diversified among a number of feasible industrial projects which can
survive according to the market potentials. Some of these industrial
proposals are economically feasible, but the interest of the
entrepreneur is directed towards other sectors of the economy giving a
higher rate of return. This diverts new investment from where it is
primarily needed and consequently distorts the development of the
contributing sectors to the economy.

If the Government adopts the hypotheses for a well-balanced
development of the economy, new advantages must be given to new
investments in the industrial sector so as to compensate for the
difference between the rate of return in that sector and that of other
sectors, thus increasing new investments in industry so as to reach
the desired rate of growth.

QUESTIONNAIRE

1. Do you use a ball-point pen? Yes _____ No _____

2. If No, why? _____

3. What brand do you usually use? (Check more than one, if necessary)

   Universal _____ Faber _____ Bic _____ Parker _____

   Schneider _____ Others specify _____

4. Which brand do you prefer?

   Faber _____ Universal _____ Parker _____ Schneider _____

   Bic _____ Others specify _____ You are indifferent _____

5. How many ball-point pens do you consume per year?

   (1-5) _____ (5-10) _____ (10-15) _____ (15-20) _____

   (20-30) _____ (More than 30) _____

6. Do you buy your pen at:

   10 piasters _____ 15 _____ 20-25 _____ 30-35 _____

   40-50 _____ More than 50 _____

7. Do you usually use the brand you prefer? Yes _____ No _____

8. How often do you buy one pen?

   Each week _____ Each 2 weeks _____ Each month _____

   Each 3 months _____ You do not know _____

9. Do you buy your pen from:

   A wholesaler _____ a stationery _____ any shop _____

10. What do you consider in deciding which brand to buy?

    Price only _____ Quality only _____ Both quality and Price _____

    You do not care _____

11. How many pens do you lose per year?

    None _____ (5) _____ (5-10) _____ (More than 10) _____

12. How many coloured pens do you use per year?

    (1-5) _____ (5-10) _____ (More than 10) _____

13. Do you leave a ball-point pen in the place you usually work?

    Yes _____ No _____

14. How long it will take you to consume one pen?

    One week _____ Two weeks _____ One month _____ Two months _____

    Six months _____ More than six months _____

15. How many pens do you own now?

    One _____ Two _____ Five _____ More than five _____

16. How many ball pens do you receive free of charge per year?

    All of them _____ None _____ (1-5) _____ (5-10) _____

    You don't know _____

17. What colour do you usually use?

    Red _____ Green _____ Blue _____ Black _____

18. Do you buy your ball pen yourself? Yes _____ No _____

19. If Yes, All the time _____ Most of the time _____

                                                Thank you.

TABLE A-1

STUDENTS IN SECONDARY SCHOOLS
YEAR 1962 - 1963

	Private			Public			TOTAL (000)
	Boys (000)	Girls (000)	Total (000)	Boys (000)	Girls (000)	Total (000)	
Beirut	20.6	19.1	39.7	3.8	2.9	6.7	46.4
Bekaa	2.1	0.9	3.0	8.7	5.1	13.8	16.8
Mount Lebanon	16.3	4.0	20.3	9.8	8.3	18.1	38.4
South Lebanon	2.4	1.1	3.5	12.8	7.5	20.3	23.8
North Lebanon	7.1	4.7	11.8	12.3	10.9	23.2	35.0
Total	48.5	29.8	78.3	47.4	34.7	82.1	160.4

Source: Ministère du Plan, Office de Statistique.

TABLE A-2

STUDENTS IN PRIMARY SCHOOLS
YEAR 1962 - 1963

	Private			Public			TOTAL (000)
	Boys (000)	Girls (000)	Total (000)	Boys (000)	Girls (000)	Total (000)	
Beirut	22.5	17.0	39.0	2.7	2.6	5.3	44.8
Bekaa	6.3	5.8	12.1	8.3	4.7	13.0	25.1
Mount Lebanon	24.0	24.8	48.8	9.3	8.0	17.3	66.1
South Lebanon	5.7	3.2	8.9	12.5	7.5	20.0	28.9
North Lebanon	7.0	8.9	15.9	11.8	10.7	22.5	38.4
Total	65.5	59.7	125.2	44.6	33.5	78.1	203.3

Source: Ministère du Plan, Office de Statistique.

TABLE A-3

POPULATION REPARTITION
1ST JANUARY, 1963

Age	Percentage	Number
0 - 14	12.5	269,000
5 - 11	18.5	398,120
12 - 20	21.0	451,920
21 - 34	18.0	387,360
35 - 50	17.0	365,840
51 and over	13.0	279,760
Total Lebanese	100.0	2,152,000
Engineers		361,920
TOTAL POPULATION		2,513,920

Source: Commer ce du Levant, April 15, 1961, p. 38.
          Ministère du Plan, Office de Statistique.

MACHINERY

Machines Required for the Production of Points Only

1. Two "Lathes Tornos M-7" machines to produce conical blanks.

2. One "Lathe Tornos M-4" machine to produce cylindrical blanks.

3. One "Centrifuge 4 EO" for cleaning blanks.

4. One "Point Matic 7" machine for the production of ball-point.

5. One cleansing device "Philippi II" for degreasing

Machines Required for the Production of Refills Only

1. One "DK 61" machine for plastic tubes production.

2. One Extruder for cutting.

3. OneCentrifuge 5PM for cleansing.

4. One "AB-L-5" machine for ink filling.

Machines Required for the Production of Ball-pen Body

1. One Injection moulding machine with preplasticizer model "DS VARIANT".

2. One set of moulds for the caps.

3. Two sets of moulds for the bodies.

4. One set of moulds for the plugs.

Machines Required for Control, Assembling, and Printing

1. One stereoscopic microscope type "Wild M 4" for points control.

2. One workshop measuring microscope type "ISOMA M 101" for conical and cylindrical blanks control.

3. One printing machine type "PRESSOR 16".

4. One pressor machine for assembling.

Raw Materials Required

The raw materials are required for the production of the plastic bodies and for the production of refills.

Plastic Bodies Requirements

Bodies

Polystyrène III F	Non-coloured.
Polystyrène III F	Coloured.
Luran 52	Coloured.

Cap with or without clip

Polystyrène III F	Coloured.
Luran 52	Coloured.

Plug

Polystyrène III F	Coloured.
Luran 52	Coloured.

Refills Requirements

Brass for the production of points.

Ink.

Plastic.

Polyethylene

COST OF MACHINES

Cost of Machines Needed for Point Production

Type	No.	Total Price (LL.)
Lathe Tornos M - 7	2	33,600
Lathe Tornos M - 4	1	14,700
Point Matic 7	1	21,000
Philippi II	1	21,000
Microscope	1	3,500
T o t a l	6	93,800

Cost of Machines Needed for Refills Production

Type	No.	Total Price (LL.)
DK - 61	1	9,100
Extruder	1	12,600
AB - L - 5	1	11,200
Centrifuge 5 PM	1	5,600
Microscope	1	3,500
T o t a l	5	42,000

Cost of Machines for Bodies Production

Type	No.	Total Price (LL.)
Plastinjector V111	2	51,000
Stove	1	2,800
Mill	1	1,500
Cap Moulds (set)	1	4,800
Body Moulds (set)	2	13,700
Plug Moulds (set)	1	4,500
T o t a l	10	78,300

Cost of Assembling, Printing, Packing, and other Machines

Type	No.	Total Price (LL.)
Printing	1	7,000
Pressor 16 (Assembling)	1	10,700
Packing Machine	1	14,000
Compressor	3	10,500
T o t a l	6	42,200

PRODUCTION COSTS

Production Costs of Points Only - Unit Cost

Machinery required   LL.93,800

Amortisation price per point LL.0.0047

Raw material required for conical points
brass LL.0.0040

Raw material required for cylindrical points
brass LL.0.0018

Computations for Raw Materials

The conical point requires 2.75 grams of brass.

Price of one kilogram of brass LL.2.50, less the

Price of one kilogram of brass chips at LL.1.20 = LL.1.30

Brass cost $= \dfrac{1.30}{1000/2.75} =$ LL.0.0040.

	Conical (LL.)	Cylindrical (LL.)
Amortisation of Machinery	0.0047	0.0047
Brass raw material	0.0040	0.0018
Wage Cost	0.0030	0.0030
Overhead	0.0045	0.0045
Balls	0.0014	0.0014
Total Cost Per Point	0.0176	0.0154

Cylindrical Points

Price per cylindrical point	LL.0.0027
less brass chips reduction	LL.0.0009
Brass Cost	LL.0.0018

Production Costs of Refills Only

Machinery required	LL.42,000
Amortisation of machinery per refill	0.0021
Ink	0.0071
Wages	0.0018
Overhead Costs	0.0027
Plastic	0.0010
Total Cost of Refills	0.0147

Production Costs of Complete Refills

	Conical Point (LL.)	Cylindrical Point (LL.)
Costs of Points only	0.0176	0.0154
Costs of Refills Only	0.0147	0.0147
Costs of Complete Refills	0.0323	0.0301

Production Costs of Bodies

	Unibloc (LL.)	Retractable (LL.)
Machinery required (LL.78,300)		
Machinery amortisation	0.0039	0.0039
Wages	0.0040	0.0040
Overhead	0.0060	0.0060
Raw materials	0.0122	0.0157
Costs of Bodies	0.0261	0.0296

TABLE A-4

LABOUR COSTS FOR A PLANT PRODUCING
4 MILLION UNITS PER YEAR

	Yearly Salary (LL.)	Number	Total Salary (LL.)
Production Manager[1]		1	
Foreman	5,000	3	15,000
Refills Production	2,000	5 (Men or girls)	10,000
Plastic Production	2,000	3 (Men or girls)	6,000
Assembling	1,500	10 girls	15,000
Stock and other work	2,000	2 men	4,000
TOTAL COSTS			50,000

[1]The Production Manager's salary is included in the technical assistance costs.

TABLE A-5

DISTRIBUTION COSTS

	Number	Cost Per Year (LL.)
Cars[1]	3	4,000
Salesmen	2	10,000
Drivers	3	7,500
Other costs		3,500
Total Distribution Costs		25,000

[1]The price of the 3 cars is LL.20,000. The amortization is done on the basis of 5 years:

$$\frac{20,000}{5} = LL.4,000 \text{ per year.}$$

CASH FLOW

Cash Flow for the Sale Price of 15 P.L.

Cash flow   =   Net profits + Depreciation.

Net profits   =   Sales (Costs of sales + rent)

             =   375,000 − (251,000 + 13,000) = 111,000

Net profits after taxes   =   111,000 − 21,000   =   90,000

Cash flow if taxes are not paid

                              111,000 + 64,000   =   175,000

Cash flow if taxes are paid   90,000 + 64,000   =   154,000

Cash flow for the sale price of 12 P.L.

Cash flow   —   Net profits + Depreciation

Net profits   —   Sales − (Costs of production + rent)

$$300,000 − (251,000 + 13,000) − 36,000$$

Net profits after taxes   — $36,000 − 3,400$ — $32,600$

Depreciation — $\dfrac{320,000}{5}$ — $64,000$

Cash flow if taxes are not paid $36,000 + 64,000 − 100,000$

Cash flow if taxes are paid $32,600 + 64,000 − 96,600$

Working Capital Needed for Operations

		Working Capital Needed (LL.)
Raw Material cost	LL.120,000	
Working capital for raw materials[1]		30,000
Other costs[2]	(LL.)	
Labour	50,000	
Overhead	50,000	
Distribution & Advertising	30,000 130,000	22,000
Working capital to finance sales[3]		46,875
T o t a l		98,875

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[1] Assuming a turnover of 4 times.

[2] Assuming a turnover of 6 times.

[3] Assuming that 50% of sales are on credit terms of 3 months

$$\frac{375,000 \times 0.50}{4} = LL.46,875$$

TABLE A-6

INCOME TAX ON INDUSTRIAL AND COMMERCIAL CONCERNS

Income Bracket (LL.)	% Tax	Income Tax on Bracket (LL.)	Cumulative Income Tax (in LL.)
5,000	5	250	250
15,000	7	700	950
25,000	9	900	1,850
35,000	13	1,300	3,150
50,000	17	2,550	5,700
75,000	22	5,500	11,200
100,000	27	6,750	17,950
250,000	32	48,000	65,950
500,000	37	92,500	158,450
over 500,000	42		

Source: Ministère de l'Economie Nationale.

Method Followed in the Market Research

To obtain the information needed for the Demand Analysis, a questionnaire[1] was distributed to potential consumers, and interviews were made with those who were judged not being able to answer the questionnaire (as in the primary schools and the rest of the population segments). A form of the questionnaire distributed is presented on page 81. The questions asked to consumers who did not answer the questionnaire were restricted to numbers 1, 4, 5, 11, 15, and 16 of the form distributed.

The market research was done mainly in the region of Beirut and its suburbs which accounts for the major part of potential consumers.

Questionnaires were also distributed in the following towns and villages:[2]

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[1]The questionnaire was distributed in three languages, English, Arabic, and French.

[2]The names underlined are those from which answers were received.

<u>Tripoli</u>

<u>Saida</u>

<u>Zahlé</u>

Baalbeck

Marjeyoun

<u>Rachaya</u>

<u>Hasbaya</u>

Nabatieh

<u>Bint-Jbeil</u>

Kalamoun

<u>Becharré</u>

Zghorta

<u>Amyoun</u>

<u>Jezzin</u>

<u>Aley</u>

<u>Souk-el-Gharb</u>

<u>Brummana</u>

<u>Wadi-Shahrour</u>

<u>Junieh</u>

The research covered the following schools and colleges in Beirut and its region.

The American University of Beirut

Collège Protestant Français

Mar Elias Btina College

Makassed College

Saint Joseph University

Beirut College for Women

International College

Lycée Français

Collège des Frères du Sacré Coeur

Zahret al Ihsan College

Haud al-wilayat School

Brummana High School

Aintura College

Collège des Apôtres - Junieh

Victoria College - Baabda

The research covered also government services, banks, private and public companies in both the commercial and service sectors, and other potential consumers (who were grouped in the rest of the population sector).

The distribution of questionnaires and tabulation of the information gathered were made according to standard procedures and summarised and grouped in the market segment where they belong.

Capital Recovery Period Computations for the Sale Price of 15 P.L.

$$n = \frac{\log \left(\frac{U}{U - rI}\right)^1}{\log (1 + r)}$$

Substituting by the results in the cost analysis if taxes are paid.

$$n = \frac{\log \dfrac{175,000}{175,000 - (0.08 \times 420,000)}}{\log 1.08}$$

$$n = \frac{\log 1.23}{\log 1.08} = \frac{0.08991}{0.03342} = 2.6$$

If taxes are not paid:

$$n = \frac{\log \dfrac{154,000}{154,000 - (0.08 \times 420,000)}}{\log 1.08}$$

$$n = \frac{0.10721}{0.03342} = 3.2$$

The same computations were made for the sale price of 12 P.L., the results are:

If taxes are paid   n = 6.0

If taxes are not paid   n = 5.2

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[1]Spencer and Siegleman, Managerial Economics Decision Making and Forward Planning, (Homewood, Illinois, Irwin, Inc., 1959), p. 382.
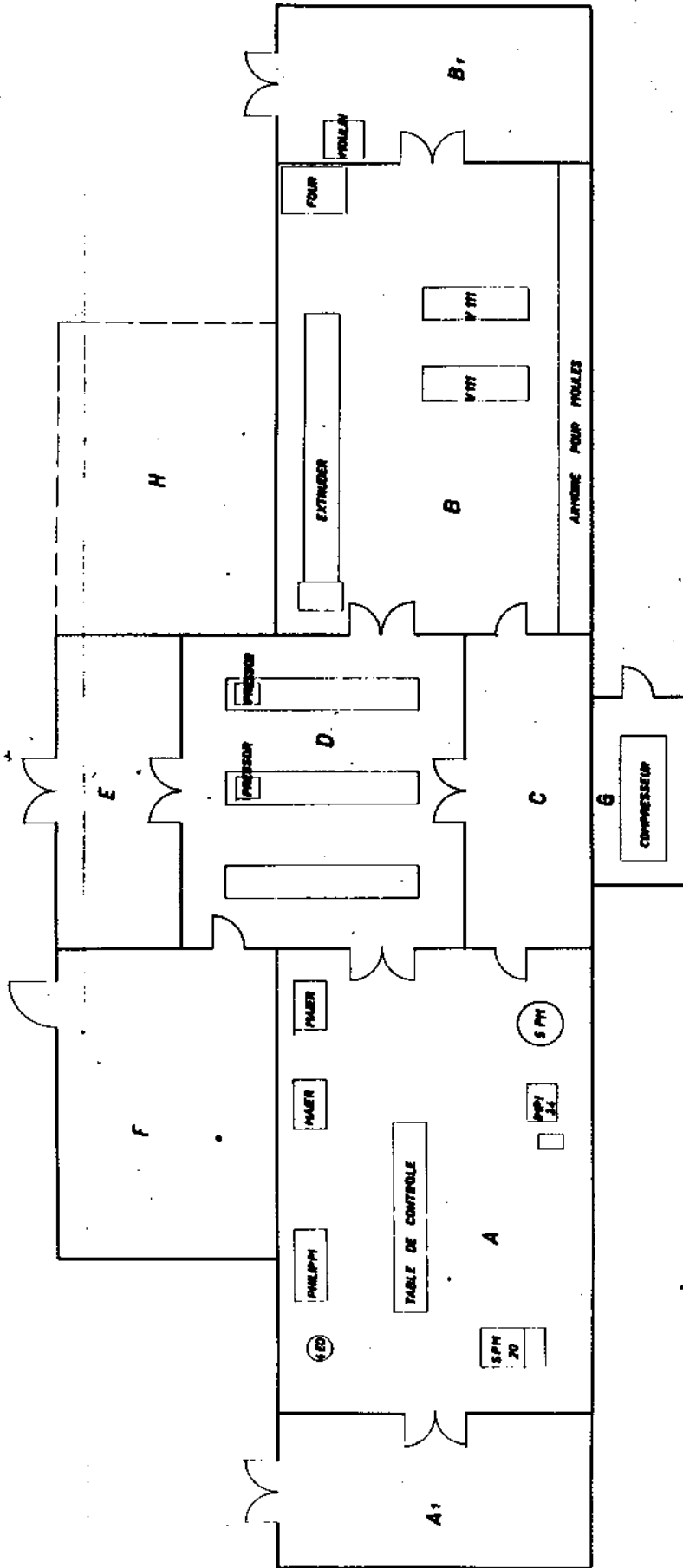
Annual Cost Computations

$$U = \frac{I\ r\ (1 + r)^1}{(1 + r)^n - 1}$$

$$U = \frac{420{,}000 \times 0.08\ (1.08)^5}{(1.08)5 - 1}$$

$$U = \frac{53{,}088}{0.58} = \text{LL}.91{,}500$$

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[1]Spencer and Siegleman, <u>Managerial Economics, Decision Making and Forward Planning</u>, (Homewood, Illinois, Irwin, Inc., 1952), p. 384.

PLATE I

PLAN OF THE PLANT

ECHELLE 1:100

PROJEKT KAMEL

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