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Steel Industry and Market
in Lebanon

By

Hagop Y. Demirdjian

Approved:

Prof. Emile Ghattas
Assistant Professor

Advisor

Emile Ghattas

Prof. Muhammad Atallah
Lecturer

Member of Committee

M. Atallah

Prof. Nimr Eid
Assistant Professor

Member of Committee

Nimr Eid

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BY

HAGOP Y. DEMIRDJIAN

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STEEL INDUSTRY AND MARKET
IN LEBANON

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ABSTRACT

In establishing a heavy industry, specially in a developing country, due consideration should be given to the social and economic benefits and costs of the venture. Yet sometimes inefficient industries are protected behind high tariff walls for national pride or some other unjustifiable reason.

This thesis attempts to clarify two main hypotheses: that the existing steel industry in Lebanon is inefficient, and that in the short run an integrated steel industry is not feasible locally.

In any feasibility study or a study of the market conditions of a certain line of activity, the total economic conditions in the country should be given as a background. Chapter I aims at giving such a background.

Chapter II has two main divisions. The first part tries to give some general information about the

world's steel industry. This is necessary in order to understand the functioning of the industry as it exists in Lebanon and to assess its feasibility. The second section treats the historical development of the industry in Lebanon generally and discusses the two rolling mills in particular.

Market conditions are discussed in Chapter III. Special attention is given here to pricing and efficiency. The dependence of local on European prices will be shown and the efficiency of the two rolling mills taken together will be compared to European firm's efficiency.

Chapter IV deals with the future. Is an integrated steel industry in Lebanon feasible? Several factors will have to determine such a decision: the demand level, the availability of natural and human resources and capital.

The inavailability of statistics is a well known phenomenon in Lebanon. As far as steel is concerned the situation is even worse. In the absence of any published material about the Lebanese steel market, the author had

to resort to personal interviews and research. To get the local prices of steel, it was necessary to go to the ledgers of merchants while to get European prices about 200 issues of Metal Bulletin were consulted. To assess the market conditions in the trade sector, questionnaires were prepared and the people involved were interviewed. Yet this method proved to be unsuccessful, because the merchants were not well versed in business terms, and usually the information given by them was not accurate. Thus the author resorted to indirect methods such as asking competitors about their rival firms. It was felt that this would give a more reliable picture of the firms' behaviour than that provided by firm managers themselves.

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CHAPTER I
SOCIAL, POLITICAL AND ECONOMIC STRUCTURE
OF LEBANON

Before obtaining its independence after the Second World War in 1943, Lebanon, whose area is some 10,400 square kilometers, formed a part with Syria of a much larger economic unit. In March 1950 the two countries decided to dissolve the economic partnership by which they were bound together. Very few people then thought that Lebanon, divorced as she was from the Syrian hinterland, could survive as an economic unit. To their great surprise, Beirut managed in a few years to become the commercial and financial capital of the Middle East.¹ Though small, Lebanon has a significance in the Middle East out of proportion to its size owing to its commerce, its position as a gateway between East and West, and its

¹The Middle East and North Africa 1967-68
(London: Europa Publications Limited, 1967), p. 442.

importance as a financial, educational, medical, and tourist center. This country, which is a member of the Arab League, has always kept close links with the West.

During the last two decades, the performance of the Lebanese economy was characterized by tremendous economic growth and progress. Population grew between 1955 and 1966 by about a third. However the natural rate of increase is believed to be in the region of 2.5 percent compounded annually.² National income on the other hand grew at a rate of 6 percent compounded annually from L.L. 1,042 million in 1950 to L.L. 2,500 million in 1965.³ In fact between 1965 and 1966 the rate was estimated at 8 percent by the Ministry of Planning. But the Lebanese economy suffered considerably as a result of the 1958 political crisis: there was a flight of capital, disruption of transport and retail trade and above all

²Based on statistics in the United Nations Demographic Yearbook 1966 (New York: United Nations, 1966), pp. 126-127.

³Compiled from various publications of the Economic Research Institute. In 1967 actual figures for national income were issued by the Ministry of Planning which put national income in 1964 at L.L. 2,861 million and in 1965 at 3.062 million.

stagnation at Beirut port, reflecting a loss of transit trade and a decline in total trade. The economy was also somehow crippled by the liquidity crisis in the fall of 1966 caused by the failure of Intra Bank, the biggest commercial bank in Lebanon. It is argued by many observers that as a result of this crisis, confidence in Beirut as the indisputed international banking center in the area was shaken and perhaps impaired for good.⁴ The June War in 1967 following the liquidity crisis of the previous year had equal ill-effects. The services sectors which contributed more than 60 percent of the national income in 1964 suffered a severe blow.⁵ Tourism in particular felt the pinch.

With these general notes on the performance of the Lebanese economy over the past two decades, one is very tempted to try to dig into the reasons which have so far been responsible for the development of this economy.

⁴The Quarterly Economic Review, 1967 (London: The Economist Intelligence Unit, 1967), p. 14.

⁵Les Comptes Economiques de l'Annee 1964 (Beirut: Ministry of Planning), p. 27.

In this connection it is imperative to glance briefly at the socio-political set-up of the Lebanon which in one way or another has directly or indirectly affected the success of the country's growth.

The present-day socio-political structure of the country dates back to September 1920, when the Lebanon was declared a republic. The Biqa' Plateau and several coastal towns were added to the center of the region, Mount Lebanon. Different tribes and religious sects have sought asylum in Mount Lebanon. Consequently a policy of tolerance and liberalism has emerged, ultimately leading to political autonomy. It is argued that the special religious structure of the population and the rugged topography of the country were responsible for this liberalism.⁶

This special religious structure has been reflected in the country's constitution which more or less provides for an equitable representation in parliament and other governmental posts. Although there are many religious groups, no one religious community forms an absolute majority. Another by-product of this policy of liberalism has

⁶Based on an unpublished report by Elias Saba on the Socio-Economic Structure of Lebanon.

been the tremendous drive for westernization. In recent years Lebanon has stuck out among the other countries of the area for its significant attempts to modernize, and imitate more developed countries.⁷

Sectarianism which has resulted from this set-up has not been an impediment for social mobility. "It is true however that although this sectarianism has turned the communities into separate groups vying with each other as groups for power and benefits, socially there is very little class differentiation between landowner, townsman-merchant or manual laborer."⁸ Social mobility has been intense in Lebanon. The existence of a strong middle class consisting of merchants and professionals has greatly accelerated the process of development. This class forms the largest proportion of Lebanese entrepreneurs, the agents of growth.

The channel through which people move from one class to another has been education. Lebanon enjoys the highest literacy level among all the Arab countries. The

⁷ Ibid.

⁸ Yusif Sayegh, "Lebanon: Special Economic Problems Arising from a Special Structure," Middle East Economic Papers 1957 (Beirut: American University of Beirut), p. 62.

total number of students registered a marked rate of growth as seen in the following table of students enrolled between 1957 and 1962:

TABLE 1

TOTAL NUMBER OF STUDENTS IN LEBANON

<u>Type of School</u>	<u>1957</u>	<u>1959</u>	<u>1962</u>
Primary	228,500	229,100	246,758
Secondary	32,000	39,364	98,461
Technical	-	-	961
Higher	-	5,676	11,265

Source: United Nations, Statistical Yearbook, 1960 and 1964, New York, 1961 and 1965.

In particular, enrollment in secondary schools during the period under review has slightly more than trippled. But the educational system in Lebanon is basically geared to emphasize law and the liberal arts. For development purposes more weight should be given to scientific, technical and vocational education.⁹

⁹Ibid., p. 65.

To return to the economic reasons, perhaps the best answer, for the moment, is to attribute this aforementioned 6 percent rate of growth to the performance of the services sectors in Lebanon amid an investment climate of free enterprise. It becomes imperative at this juncture to examine in detail the various components of the Lebanese economy. The table below on the distribution of income and employment for 1956 could perhaps be taken as a basis to assess the relative importance of the different economic sectors especially because no substantial variations in these relative figures have taken place since 1956 as seen in Tables 3 and 4.

TABLE 2
DISTRIBUTION OF INCOME AND EMPLOYMENT
(1956)

	<u>Employment Percentage</u>	<u>Income Per- centage</u>
Agriculture	50	15
Industry	11	15
Construction	8	4
Commerce, Finance & Rent	14	46
Transport	5	5
Government	4	7
Other Services	<u>8</u>	<u>8</u>
	100	100

Source: Higgins Report (Typescript), p. 3.

TABLE 3

INCOME DISTRIBUTION

	<u>1956</u>	<u>1964</u>	<u>1965</u>
Agriculture	15	11.9	11.6
Industry	15	12.8	13.1
Construction	4	5.6	5.7
Commerce, Finance, Rent	46	43.3	41.9
Transport	5	8.1	8.3
Government	7	7.6	8.1
Energy Water	-	2.2	2.2
Other Services	<u>8</u>	<u>8.5</u>	<u>9.1</u>
TOTAL	100	100	100

Source: Figures for 1956 were obtained from Higgins Report (Typescript), p. 3. Those for 1964 were obtained from Les Comptes Economiques de l'Annee 1964 (Beirut: Ministry of Planning), p. 27. Finally those for 1965 were privately secured from the Ministry of Planning.

TABLE 4
EMPLOYMENT DISTRIBUTION

	<u>1956</u>	<u>1956</u>	<u>1959</u>	<u>1963</u>
Agriculture	50	48.9	51.7	50
Industry	11	12.0	17.6	11
Construction	8	7.3		8
Commerce, Finance, Rent	14	12.3	17.2	14
Transport	5	5.3		5
Government	4	3.6	2.9	4
Other Services	<u>8</u>	<u>10.7</u>	<u>10.5</u>	<u>8</u>
TOTAL	100	100	100	100

Source: Figures for 1956 (column 1) obtained from Higgins Report (Typescript), p. 3. Figures for 1956 (column 2) and 1959 obtained from IRFED Mission, Besoins et Possibilites de Development du Liban, Tome I (Beirut: Ministry of Planning, 1961), p. 87 and p. 89. Finally those for 1963 obtained from Charles Rizk, Le Regime Politique Libanais (Paris: Librairie Generale de Droits et de Jurisprudence, 1966), p. 37.

It is obvious from Table 2 that the services sectors make the biggest contribution to the national output. Whereas these sectors create about two-thirds of the national product, the commodity producing sectors of the

economy, namely, industry and agriculture, yield about one-third of the national product. Very few other countries in the world exhibit this particular feature in their sectorial distribution of income. Such a feature in the Lebanese economy is a cause for alarm because one can never make sure that the favorable factors which are vital to ensure the successful performance of the economy will always be present.¹⁰ In the following pages, the Lebanese economy will be analyzed sectorially.

Agriculture

Although this sector provides employment for about 50 percent of the labor force (see Table 2), the income generated is as low as 15 percent of the total national product. One quarter of Lebanon is uninhabited mountainous land, but there are excellent agricultural areas in the hot coastal strip and the rich valley of the Beqa'. Irrigation projects are already in progress in these two areas and about 25 percent of the

¹⁰Marwan Iskandar, Social Security for Lebanon (Beirut: Dar al-Talia'h, 1962), p. 25.

192,200 hectares cultivated is already irrigated. Farming is pretty intensive; but the scope for expanding the cultivated areas is limited. At present only 11 percent of the land is cultivable and much of this is marginal.¹¹ Throughout the country the size of the average holding is exceedingly small. According to a survey carried out in 1953 by the U.S. Operations Mission, out of a total number of about 150,000 agricultural holdings, at least 132,000 were of 25 acres or below.¹² It should be recalled here that a plot of 25 acres is not small by Middle Eastern Standards, especially if it is irrigated.

The main agricultural products are fruit and vegetables which form the country's main visible exportable goods. Exports of citrus fruits and apples stood at 128,000 tons and 102,000 tons respectively in 1966. Overall agricultural production totalled LL.331 million, fruit production was estimated at LL.199 million,

¹¹The Quarterly Economic Review, 1967,
op. cit., p. 15.

¹²The Middle East and North Africa 1967-68,
op. cit., p. 442.

vegetables at LL.63 million and cereals at LL.27 million. Other crops include olives, grapes, sugar cane, sugar beet and tobacco mainly for local consumption.¹³

Industry

In so far as it is known, the mineral wealth of Lebanon is not substantial. But in the early part of the century both iron and lignite were mined. Deposits of bitumen are known to occur near Hasbaya. Despite the fact that no oil has yet been found in commercial quantities, the geographic position of the country is of great importance to the oil industry of the Middle East. Two important pipelines cross the country; the first from Iraq Petroleum Company oil wells in Kirkuk to the Mediterranean at Tripoli, and the second from Dhahran in Saudi Arabia to Zahrani. Oil transit revenue accruing to the Lebanese Government in 1967 amounted to L.L. 39.4 million.¹⁴

By Middle Eastern standards, Lebanon is relatively industrialized. According to an official survey,

¹³The Quarterly Economic Review, 1967,
op. cit., p. 15.

¹⁴Middle East Economic Survey, February 2,
1968, p. 17.

there were in 1964, 9,558 industrial establishments with 4,840 of them employing less than 3 workers and the remaining 4,718 employing 3 or more workers. Of these establishments 2,099 are considered relatively important, employing 41,093 workers. Only 6.7% of these 2,099 establishments employ more than 50 workers and they absorb more than half of the 41,093 workers. These 2,099 establishments are said to invest in industry some L.L. 69.4 million of which 73.2% is invested by firms employing 50 workers or more. Total transactions have amounted to L.L. 862.5 million with a value added of 312 million and wages and salaries bill of L.L. 118.2 million.¹⁵

Geographically most of these establishments are centered in or around Beirut. Specifically, 39.2 percent are domiciled in Beirut; 28.8 percent around Beirut; 8.5 percent in Tripoli and suburbs ; 15.3 percent in Mount Lebanon; 3.5 percent in Beqa'; 3.1 percent in North Lebanon excluding Tripoli and 1.6 percent in

¹⁵Recensement de l'Industrie au Liban 1964
(Beirut: Ministry of Planning), pp. 5-14.

South Lebanon.¹⁶

In Lebanon the bulk of industrial activity is geared towards light industries. Their importance measured in value added is the following: foodstuffs, L.L. 43.3 million; tobacco, L.L. 40.6 million; textile, L.L. 24 million; clothing and shoe-making, L.L. 22 million; furniture, L.L. 17.6 million; beverages, L.L. 16.9 million. Of the heavier industries the non-metallic, excluding petroleum products, leads with a value added of L.L. 42.8 million followed by petroleum products L.L. 17 million.¹⁷

Perhaps the reason for the disproportionate development of Lebanese manufacturing industries may be attributed to the frustration resulting from the economic separation of Lebanon and Syria in 1950. Originally these industries were designed to cater for the two markets. Therefore, Lebanon's industry suffered a severe blow from the narrowness of the market caused by this separation. In fact this particular feature of the Lebanese market, namely its small size, has been a

¹⁶Ibid.,

¹⁷Ibid., pp. 32 - 35.

serious obstacle to the establishment of future industries, a phenomenon which will become obvious in the course of this study on the Lebanese Steel Industry. But another handicap has been, and still remains, the shortage of fuel and electric power cheaply provided for industrial plants.

Foreign Trade

From ancient times Lebanon has been a flourishing trade center because of its strategic geographical location and the shrewd business mentality of its people. The Lebanese, it is claimed, are born merchants who have kept close commercial contacts with the West and the Arab world.¹⁸ After 1948 all the port activity which was previously handled by Haifa port was rechannelled through Beirut. Until the Aqaba port was completed, transit trade passed through Beirut to Jordan. The importance of the trade sector is obvious from its relatively high contribution to national income (about 32.1 percent in 1964;

¹⁸ A.E. Asseily, Central Banking in Lebanon (Beirut: Khayat Book and Publishing Co. S.A.L., 1967), p. 32.

the largest single contributor).¹⁹ But there has been an adverse balance of visible trade for many years now. As can easily be seen from Table 4 the balance of trade shows that there has been steady growth in the deficit, excluding the years 1958 and 1962. In 1958 the decline in exports was less than the decline in imports, while in 1962 the growth in exports has been greater than that in imports. The ratio of the value of merchandise imports to that of exports is known to be over five to one. This deficit on the merchandise account is offset by exports of services and capital inflow from the Arab world and remittances from the Lebanese of whom there are large numbers in the United States of America, South America and Africa.

The principal articles of export are fruit and vegetables whose volume has expanded greatly in recent years. Much of these are flown to the large communities working in the oilfields of the Arabian Gulf. The principal import consists of grain and flour. Cattle is also imported as well as a whole range of industrial raw

¹⁹Les Comptes Economiques de l'Annee 1964,
op. cit., p. 27.

TABLE 5

SUMMARY OF LEBANON'S BALANCE OF PAYMENTS
FOR 1957-65 (IN L.L. MILLION)

	1957	1958	1959	1960	1961	1962	1963	1964	1965
A. Current Account									
1. Merchandise Trade	-576	-556	-610	-768	-812	-738	-856	-900	-1065
2. Non-monetary Gold	- 9	- 7	- 9	- 8	- 7	- 7	- 7	- 9	- 9
3. Foreign Travel & Tourism	+ 82	+ 40	+ 62	+ 81	+118	+126	+149	+136	+178
4. Transportation & Insurance	+ 68	+ 48	+ 78	+106	+122	+166	+160	+162	+ 178
5. Investment Income	+ 32	+ 39	+ 43	+ 55	+ 72	+ 68	+ 68	+ 74	+ 78
6. Gov't. not included elsewhere	+ 35	+ 43	+ 51	+ 52	+ 67	+ 66	+ 68	+ 83	+ 79
7. Miscellaneous Services	<u>+114</u>	<u>+ 98</u>	<u>+145</u>	<u>+172</u>	<u>+188</u>	<u>+189</u>	<u>+199</u>	<u>+198</u>	<u>+ 208</u>
Total Goods & Services	-254	-295	-240	-310	-252	-130	-219	-256	- 353
8. Donations	+100	+165	+108	+105	+120	+ 98	+109	+109	+ 108
Total Current Transactions	-154	-130	-132	-205	-132	- 32	-110	-147	- 245
Errors and Omissions					+ 53	+ 10	+ 42	+ 75	+ 47
B. Capital Account									
9. Long-term Capital	+183	+130	+156	+216	+ 62	+ 63	+ 57	+ 84	+ 79
10. Short-term Capital	<u>+ 7</u>	<u>+ 14</u>	<u>+ 9</u>	<u>+ 42</u>	<u>+104</u>	<u>+ 67</u>	<u>+ 58</u>	<u>+107</u>	<u>+ 146</u>
Total	+190	+144	+165	+258	+166	+130	+115	+191	+ 225
Total (A) + (B)	+ 36	+ 14	+ 33	+ 53	+ 87	+108	+ 47	+119	+ 27
C. Balancing Items									
11. Foreign Exchange					- 11	- 42			
12. Monetary Gold				- 53	- 65	- 96		-119	- 27
13. Banking Liabilities					<u>- 11</u>		<u>- 47</u>		
Total	- 36	- 14	- 33	- 53	- 87	-108	- 47	-119	- 27

Source: For 1957-60: Khalil Salem, Unclassified "Lebanon: Balance of Payments, 1960", (Typewritten).
 For 1961 : Khalil Salem, Lebanese Balance of Payments for 1961, The Economic Research Institute, A.U.B., pp. 12 and 13.
 For 1962&63: Khalil Salem, Lebanese Balance of Payments for 1962 and 1963, Economic Research Institute, A.U.B., pp. 10-11.
 For 1964&65: George Medawar, Lebanese Balance of Payments for 1964 & 1965, Economic Research Institute, A.U.B., pp. 28-29.

materials notably fuel and timber, and of course, machinery and manufactured goods of all descriptions.

In 1965 an agreement was signed between Lebanon and the European Economic Community (EEC) providing that the two parties should grant each other most-favored nation treatment on tariff and other obstacles to trade, and that the EEC should make technical assistance available to Lebanon for exploiting the country's economic resources.²⁰

Transport and Communication

This sector is said to contribute 8.3 percent of the national product.²¹

One of the major revenue earning activity in this sector is the airline business. Foreign payments to Lebanese airlines have been increasing steadily and Lebanese passengers tend to use Lebanese carriers. Although Beirut port handles the bulk of the transit trade,

²⁰ The Middle East and North Africa, op. cit. , p. 443.

²¹ Les Comptes Economiques de l'Annee 1964, op. cit., p. 27.

the main petroleum traffic and some merchandise still go through Tripoli port.

Merchandise turnover in Lebanese ports has increased during recent years, yet Lebanon seems to lose its relative importance as entrepot and middleman for the Middle East. This is mainly due to the emergence of neighbouring ports like Latakia and Aqaba.

Tourism

High hopes are attached to this sector especially if it improves its services. It is said that foreigners enjoy up to 65 percent of the services in this sector.²² During the period 1961 - 1965 income from tourism has risen from L.L. 147.3 million to L.L. 247.9 million.²³ Plans are presently underway to develop the touristic

²²Y. Sayegh and M. Atallah, Nazra Thania fi al-Iqtisad al-Lubnani (Beirut: Dar al-Talia'h, 1966), p. 20.

²³Economic Research Institute - Balance of Payments of Lebanon - Tourism Sector (Beirut: American University of Beirut), and National Council of Tourism Statistical Sheets.

attractions in Lebanon. These are mainly spearheaded by the private sector although the government has taken a favorable stand at this development. However, some politicians and economic experts have warned against over-emphasizing the tourism sector in Lebanon at the expense of neglecting the primary sectors in the economy.

Banking and Finance

Although the banking and finance sectors contributed some 3.5 percent of national income in 1965, their importance is by no means little. In fact the banking sector is so vital in areas like construction, trade and transport, that one could not conceive of their successful performance without an adequate banking sector.

Beirut's success as the commercial and financial center of the Middle East has mainly been due to the almost complete absence of restriction on the free movement of goods and capital. Surplus capital from the oil producing countries has begun since the early fifties making its way to Lebanese banks which now consist of over 90 officially recognised banks.²⁴ But a serious

²⁴ Annual Report of the Bank of Lebanon
published in Commerce du Levant, October 15, 1967.

blow to confidence in the banking system, both inside and outside the Lebanon was the failure in October 1966 of Intra Bank. This establishment was the largest Lebanese bank, Its capital was mostly owned in the Lebanon, and it had many branches in the Middle East and the main financial centers of Western Europe. Observers at the time attributed this failure to the general economic laissez faire ruling in the country. The State-owned central bank was too inexperienced and too new to be able to avert this banking crisis. A lot of damage was done and it was argued that perhaps Beirut had lost its role as banker to the Middle East forever. However, there is a genuine need for banking reform in Lebanon. Banking facilities are basically geared to cater for short-term commercial transactions whilst long-term credit, except for very few institutions, is practically non-existent. Such a situation which openly discriminates against long-term credit facilities is inimical to agricultural and industrial development. The recent banking legislation is an attempt to remedy the situation. This banking legislation which has come after the confidence crisis in 1966 consists^{mainly}/of the following developments. Firstly,

the Guarantee of Bank Deposits bill in May 1967 mainly designed to restore confidence to the banking sector and protect the small depositors.²⁵ Secondly, came the bill for Medium and Long-Term Credit Bank which provides for the setting up of specialised banks with a minimum fully paid up capital of L.L. 15 million.²⁶

The foregoing is a brief description of the structure of the Lebanese economy. Economic activity in this country is conducted under a system of free enterprise with a minimum government intervention. Economic power in Lebanon does not derive primarily from the ownership of land. Nor is economic power centered in organizations of urban industrialists, or labor groups. The labor movement is not strongly conscious of itself and hence its organization is weak and its power is still limited in the economic and political spheres. It is therefore merchants and commercial bankers who are the most powerful groups in shaping the economy and in supporting a philosophy of freedom which underlies the whole system.²⁷

²⁵The Official Gazette, Supplement, No. 37, May 8, 1967.

²⁶The Official Gazette, No. 33, April 24, 1967.

²⁷Report by FAO Mediterranean Development Project on Lebanon, 1959, p. 3.

Despite the relative success of the Lebanese economy in the last two decades, the system still suffers from inherent defects. For one thing, there is a serious maldistribution of income sectorially and geographically mainly due to the mercantile nature of the economy. Only 4 percent of the population are estimated to earn above \$1,000 per capita annually (see Table 6). Half the labor force is engaged in agriculture and only receives 14 percent of national income. Transport, trade, financial and industrial activities are concentrated around or in Beirut which places other geographical areas at a disadvantage.²⁸

Planning organizations are not sufficiently developed in the country and this has resulted in inefficient allocation of existing resources among alternatives. Consequently, there is widespread underemployment of unskilled and sometimes skilled labour in certain sections of the economy especially in the agriculture and the public sectors. A good portion of the Lebanese Population feels a vacuum resulting from the negative attitude

²⁸Based on an unpublished report by Elias Saba on the Socio-Economic Structure of Lebanon.

TABLE 6

INCOME DISTRIBUTION IN LEBANON - 1959

<u>Per Cent of Total Population</u>	<u>Cumulative % of Total Population</u>	<u>Maximum Annual Income Per Family</u>
9	9	\$ 400
41	50	840
32	82	1650
14	96	5000
4	100	over 5000

Source: IRFED Mission, Etude Preliminaire Sur Les Besoins et Les Possibilités de Development au Liban 1959 - 60.

of the government to economic development. According to a study prepared in 1959 on the views of a group of 170 Lebanese upper-income-bracket businessmen, professionals, salaried non-governmental employees and government workers to certain issues including economic development, there was a consensus of opinion that the government should shoulder the major responsibility for economic development.²⁹ Surely if the relatively better off

²⁹Lincoln Armstrong, "A Socio-Economic Opinion Poll," The Public Opinion Quarterly, Spring 1959, p. 8.

portion of the population admits of such a view, then the lower-income-bracket classes would insist on a more aggressive role towards economic development on the part of the government. To them this is a move which would leave them better off materially.

Another defect of the Lebanese economy is its instability both in the short-and the long-run. This characteristic derives from its heavy dependence on services catering to foreigners and on donations and capital inflow which has been a major pillar in the success of banking in Lebanon. Income generated from such sources is subject to policies beyond the control of the Lebanese economy. This foreign orientation of the economy may one day prove detrimental despite its success so far. Experts are of the belief that there was and will ultimately be some diversion of funds from Beirut to the Euro-market after the Intra Crisis and the June War (although the 1966 and 1967 balance of payments figures are not yet out.). An examination of the figures for capital inflow between 1957 and 1965 reveals a change in the composition of total capital inflow. Although this total has averaged about L.L. 200 million, long-term capital

inflow has been declining and short-term capital inflow has been rising (see Table 5). This feature is alarming because it only confirms the fact that money passes through Beirut only to find its way ultimately into the Euro-market. If this tendency continues, then it will be harder for Lebanon to channel this short-term capital into long-term projects. If the proposed cuts in American investments abroad are carried out, then there will be a stronger attraction for capital in Beirut to leave to the European markets. Should this take place, Lebanon will be adversely hit.

Finally, the banking and finance sectors are in need of constructive reform. The nature of credit facilities provided by the banking system are predominantly short-term. While there may be a glut of funds lying idle as bank deposits, some sectors of the economy are impeded from developing because of a capital shortage. The Banque du Credit Agricole Industrial et Foncier (BCAIF) cannot supply all the necessary credit and there is a need for specialized banks of the BCAIF type for different sectors, say agriculture, industry and tourism. The National Development Bank which has been the

concern of the authorities since May 1964 has not been established yet.

As was noticed in the previous section, there are serious defects in the structure of the Lebanese economy which may one day threaten and perhaps topple the whole system. What degree of alarm should one associate with these defects is still an unsettled issue. While some policy-makers are still treading the same path of economic liberalism for the last two decades, others feel the great need for a genuine change in approach. Perhaps the recent liquidity crisis in 1966 and the June War in 1967 were serious tests to the viability of the Lebanese economy.

Has the economy ever recovered since? The more radical observers seem to think that it has not and perhaps now is the time to introduce alterations to the economic structure. They advocate "industrialization" as a new remedy to the sick laissez-faire economy. In fact they go much further and claim that as long as the Lebanese economy is not based on a firm foundation it will be open to constant attacks and threats. But is industrialization really the answer to this great problem? Are

there not serious obstacles inherent in the Lebanese economy which militate against the switch to industrialization? Off hand one can name two or three important problems which may face any industrial project. Factor-endowment, market size and social overhead capital are only a few. What impact do these have on the steel industry in Lebanon? Is the present steel industry only surviving because of national pride or economic efficiency? Would it not be a better allocation of resources if the steel industry were replaced by a cider plant perhaps? It is the aim of this feasibility study to determine the economic justification of the steel industry in Lebanon.

CHAPTER II

THE IRON AND STEEL INDUSTRY IN THE WORLD AND THE EXISTING STEEL MANUFACTURING FIRMS IN LEBANON

Steel: From Ore to Consumption

Iron and steel are indispensable components of our daily life. We come across them in our homes, buildings and vehicles. It may be said with great justification that steel consumption is a good measure of a nation's degree of development. If a nation's steel consumption is growing with time, it is a healthy sign that that nation is making important strides towards development. The following tables will prove the veracity of this statement.

TABLE 7

WORLD PRODUCTION OF CRUDE STEEL

Year	Million Tons
1900	28
1930	95
1950	189
1960	328
1966	459

Source: For 1900 and 1930, A. Weyel, From Ore to Clockner Steel, p. 9., For 1950-1966, U.N. Statistical Yearbook.

TABLE 8
WORLD CRUDE STEEL CONSUMPTION
PER CAPITA

Year	Kilograms
1900	17
1930	48
1950	76
1960	109
1966	137

Source: Same as Table 7.

World production of crude steel has increased more than 16-fold during this century, while per capita consumption has increased by more than eight times. The rate of increase in steel production during 1960-1966 has been approximately 5.78% compounded annually.

It is obvious from tables 9 and 10 that steel consumption is higher in the developed countries than in the developing Arab countries.

It is still unknown who initiated the manufacture of iron and steel. According to one story, the discovery of the process of smelting iron was made in the Middle East, early in the second millenium before Christ. Later on, this

TABLE 9
 PER CAPITA STEEL CONSUMPTION FOR SELECTED
 DEVELOPED COUNTRIES
 (IN KILOGRAMS)
 1953-1966

	53-55	56-58	58	59	60	61	62	63	64	65	66
France	221	297	314	253	306	308	318	326	356	331	347
Germany	352	396	377	444	525	490	488	473	579	540	511
Great Britain	337	362	335	332	425	357	332	368	438	424	387
Japan	77	121	112	163	208	274	242	258	324	294	369
Sweden	359	399	391	453	545	544	530	545	623	682	648
U.S.A.	574	534	433	491	501	488	488	540	615	656	667
U.S.S.R.	-	248	266	276	296	314	334	344	355	376	396

Source: United Nations, Statistical Yearbooks 1958-1967. The data relate to the apparent consumption of crude steel, i.e., production plus imports minus exports.

TABLE 10
PER CAPITA STEEL CONSUMPTION FOR SOME
ARAB COUNTRIES
(IN KILOGRAMS)
1953-1966

	53-55	56-58	58	59	60	61	62	63	64	65	66
Algeria	20	30	35	41	49	36	21	18	24	23	15
Lebanon	84	109	117	116	107	113	95	96	101	111	109
Morocco	18	14	12	13	9.7	13	14	14	16	13	15
Saudi Arabia	8	16	21	13	9.5	20	17	17	22	47	33
Syria	21	25	29	27	23	20	30	20	28	16	38
United Arab Republic	12.2	9.7	10	8.6	12.5	14	13	16	24	26	27

Source: Same as Table 9.

knowledge spread to Egypt and the Aegean. By 900 B.C. it had already reached the Upper Danube from where it was carried by migrating Celts to the different parts of Western Europe.¹ It was then that iron began to supplement the use of bronze and later acquired a position of prime importance in the production of basic weapons and equipment.

Early iron-smelting was a simple process, but it was very crude and inefficient. The ores were smelted with charcoal in pit furnaces known as "bloomery furnaces." Later on, an artificial blast was provided by bellows worked by the strength of men or animals, or by water-wheels. The draft generated by the bellows raised the temperature of the hearth.²

The bloomery furnace gradually developed into the blast furnace which is considered to be the most important technical achievement in the history of the iron industry.³

¹Norman J.G. Pounds, The Geography of Iron and Steel (London: Hutchinson University Library, 1963), p. 11.

²M.M.F. Toussaint, From Ore to Steel (Duisburg: Mulheimer Druckerergesellschaft, 1958), p. 15.

³Pounds, op. cit., p. 15.

The introduction of the blast furnace created a new set up in the industry. The mass of iron which was the output of the furnace differed fundamentally from the earlier bloom. The iron recovered from the blast furnace was poured into moulds as a result of which the technique of casting iron came into use. The invention of the blast furnace altered the scale and nature of iron-working. Bloomeries were easily built and readily abandoned. A blast-furnace was built with the expectation that it would run for years because it represented a large capital investment.⁴ It also required a lot of charcoal which became scarcer in supply as the demand for iron grew. This restricted greatly the area where the industry could be carried on, and pushed people to attempt to replace charcoal by coal in the form of coke. After a long stretch of abortive trials, the tenth century witnessed the first successful attempt to replace charcoal by coke in the blast furnace.⁵

The separation of the iron making process into smelting and refining was a further result of the introduction of the blast furnace. Pig iron, the output of the blast furnace, was not an end product. Consequently, it had to be

⁴Ibid.

⁵Toussaint, op. cit., p. 17.

refined to produce soft iron and steel.⁶ However, no significant development had been made in the refining technique to match the innovations introduced in iron smelting. Nevertheless, in the 1850's Henry Bessemer discovered a faster method of steel-making. He invented a revolutionary method of producing steel by "blowing a blast of air through a pipe inserted through the lid of a crucible filled with iron."⁷ This new invention, however, had its drawbacks, because not all of the undesirable impurities (phosphorous in particular) could be removed from pig iron. It was not until 1878 that Sidney Thomas and Percy Gilchrist were able to surmount this obstacle. Their idea was to make possible "the use of phosphoric iron by lining the converter with a material able to resist attack by various chemical compounds and steel-making temperatures, while at the same time enabling phosphorous to be removed from the metal."⁸ It was this process and another one, the Siemens-Martin process, which were subsequently adopted on a large scale.

⁶Pounds, op. cit., p. 16.

⁷Toussaint, op. cit., p. 19.

⁸Ibid., p. 20.

In the past 150 years, there have been numerous attempts to introduce improvements into the blast furnace operations. In general, the aim was to mechanize production in order to match the quality of pig iron produced, with the prevailing requirements, and to step up output.⁹ Subsequently, more important developments occurred in the refining process. Starting with the 1900's, the electric steel process was added to the Bessemer & Open hearth (Siemens-Martin) process.¹⁰ Recently a variety of oxygen-steel production processes came into existence of which the LD-Steel process, the Graef-Rotor process, and the Kaldo process are the best known.¹¹ Although there are processes that can convert iron ore directly into steel, large-scale production of steel by the direct production methods is not yet widely practised. There is a number of direct production processes in various stages of development. A successful method of the kind which uses natural gas or a gas derived from petroleum as a source of energy is the HYL process.

⁹Ibid., p. 18.

¹⁰Weyel, op. cit., p. 68.

¹¹See "Oxygen Steel Supplement", Metal Bulletin, Friday, Nov. 7, 1958, pp. 3-7.

Processes of Steel Making.

The first stage in the making of steel from iron ore is the production of iron, because it is generally accepted that steel making via iron making is economical. Pig iron, which is obtained from the blast furnace, contains about 4% carbon and other impurities such as sulphur and phosphorus. The carbon content in steel should be less than 1.5%, and the existence of other impurities should be minimized. This process of purification usually known by metallurgists as "refining" is nothing but oxidation. During the refining process, oxides escape partly in the form of gas and partly as solids which enter the slag.¹²

As mentioned above, there are several methods for refining iron. The following table, which shows the breakdown of crude steel output by process in the OECD (Organization for Economic Cooperation and Development) countries, gives us an idea of the importance of the different types of refining processes. The oxygen process, which was invented about 20 years ago, a relatively short span of time, has acquired importance as a steel making process.

¹²Toussaint, op. cit., p. 70.

Out of the total production in the United States in 1945, 90% was by the open-hearth method, 5% by the Bessemer process, and 4% in electric furnaces.¹³

In the Bessemer process, iron is run in molten form into vessels known as converters and is then purified by means of oxygen, without an external supply of heat.

TABLE 11
CRUDE STEEL OUTPUT FOR OECD COUNTRIES
BREAKDOWN BY PROCESSES

	1965		1966	
	1000 Tons	%	1000 Tons	%
Acid Bessemer	638	0.2	499	0.2
Basic Bessemer (Thomas)	33615	11.3	30521	10.1
Open Hearth (Martin)	150039	50.6	134546	44.4
Electric	39965	13.5	42389	14.0
Pure Oxygen	72520	24.4	94898	31.3

Source: The Iron and Steel Industry in 1966 and Trends in 1967, (Paris: The Organization for Economic Co-operation and Development, 1967), Appendix, Table 5.

¹³Edward Mack et al., Textbook of Chemistry, (New York: Ginn and Company, 1949), p. 640.

Steel in the Open Hearth process is made in a long hearth-type furnace with hot flames passed over the hearth. As a result, scrap and pig iron are melted, and with the help of lime and ore the steel is refined. The open-hearth process possesses a great advantage over the Bessemer process because the operation does not have to be hastened and steel of any desired composition can be produced.¹⁴

Steels of the most precise compositions, such as stainless steels and alloy steels of all grades, are usually produced in electric furnaces.¹⁵ As in the open-hearth process, scrap and pig iron are converted into steel. The oxygen required for the removal of carbon and other components is obtained from the air or from the added ore. The difference lies in the method of heating. In the electric furnace an electric arc is generally used for heating the bath of metal.¹⁶

The L-D process, the most popular of the oxygen steel-making processes, sounds comparatively simple in principle.

¹⁴Mack et al., op. cit., p. 642.

¹⁵Republic Heavy Steel Products (U.S.A. Republic Steel Corporation, 1948), p. 7.

¹⁶Weyel, op. cit., p. 12.

Instead of air emerging from the bottom, oxygen is top-blown from a lance on molten iron in a fairly normal converter. There are some variations of this system.¹⁷ The characteristic feature of steel made by the LD process is its great purity.¹⁸

It may, therefore, be concluded that the adoption of the refining process depends largely upon the chemical composition of the raw material and the quality of steel to be produced.

Types and Uses of Steel

The different manufacturing processes yield steels of different chemical compositions, not only because the chemical reactions involved are somewhat different but because the composition of the raw materials also varies.¹⁹ Consequently, one may say that there are acid bessemer,

¹⁷"Austrian Know-How, Russia's Deal with Voest", The Economist, Jan. 26, 1963, p. 341.

¹⁸"Oxygen Steel Supplement", op. cit., p. 3.

¹⁹This, however, does not mean that steel prepared by different methods could not have the same chemical composition or that steel prepared by the same process should yield steel of uniform composition.

basic bessemer, acid open hearth, basic open hearth, electric and L-D steels. The acid bessemer process, for example, is used to manufacture free cutting steels. The basic open hearth process produces carbon steels of all standard analysis, spring steels, copper bearing steels and some alloy steels, while the electric furnace is used to manufacture alloy steels and special steels.²⁰

Steel may be classified with respect to degree of completion. Ingots, blooms, billets, slabs and skelp are considered to be semi-finished steels. Ingots are forged or otherwise worked into partly finished or finished products. Blooms, billets and slabs are used for rerolling, forging and special applications, as well as for the many manufacturing purposes for which steel in these forms is required. Butt weld, lap weld and electric weld pipes are manufactured from hot rolled carbon steel skelp.²¹

Finished steels could be hot rolled or cold rolled. Merchant Bars, (rounds, squares, flats, angles, hexagons, octagons, special sections), concrete reinforcing bars, tie

²⁰Republic Heavy Steel Products, op. cit., p. 29.

²¹Ibid., p. 30.

plates, plates, spring steel, wire rods, alloy bars, stainless bars, tool steels alloy and stainless plates are usually hot rolled. Bar products themselves have got two classifications namely, merchant quality and special quality. Merchant quality bars are supplied in specific standard chemical grades or standard mechanical properties.²²

According to some statistics on steel consumption in Western Europe, about 30% goes into construction work, 20% into communication -- namely railway, ship, automobile and aircraft manufacture -- 17% into mechanical engineering, while the rest is consumed in other branches of manufacturing.²³

The Steel Industry in Lebanon

The history of the iron and steel industry in Lebanon goes back many thousands of years. The first exploiters of the local iron deposits were the Phoenicians who turned the ore into tools and weapons.²⁴ The

²² Ibid., pp. 29-31.

²³ Toussaint, op. cit., p. 134.

²⁴ Interview with B. Baramki, Prof. of History, A.U.B., July, 1968.

Romans also made use of these deposits but for other purposes. In fact, they seemed to be more concerned with the ore's value as a pigment. Definite proof of the Roman's extraction of ore exists and can be found in the caves of Marjaba, in Mount Lebanon, in the form of tools and bodies.²⁵ It is also believed that the Romans smelted the ore, but definite proof of this does not exist.

During the period of the Arab conquest, Lebanese ore came to be used once again for weapon-making. This practice seems to have continued into the Crusader era.²⁶ In the early part of this century iron was mined, and from 1952 up to 1960 ore was exported to Germany. (See Table 12).

During the mid and late fifties, ores of higher grades were discovered in Algeria and Morocco. This, coupled with the rise in the Lebanese ore transportation costs to Germany, made the local ore non-competitive.²⁷

²⁵Interview with Labib Zacca, owner of the Marjaba Mines, June, 1968.

²⁶Interview with Kamal Salibi, Chairman of the History Department, A.U.B., July, 1968.

²⁷Interview with L. Zacca.

TABLE 12

LEBANON: EXPORT OF IRON ORE

Year	Thousand Metric tons
1952	4
1953	15
1954	25
1955	21
1956	14
1957	19
1958	11
1959	1
1960	4

Source: United Nations, Statistical Yearbooks 1956
and 1961.

Yet other reasons are also given for the cessation of the exports. The Germans became dissatisfied with the Lebanese exporter for his failure to honour a contract specifying that a certain quality grade of ore was to be shipped.²⁸ The exporting firm, The National Iron and Steel Manufacturing Company S.A.L., then tried to make

²⁸ Interview with M. Minassian, Director of Engineering Laboratories, A.U.B., May, 1968.

up for these losses by undertaking local smelting of the ore. A rotary furnace having a practical capacity of 80 to 90 tons of pig iron per day, was installed at Jisr Basha, near Beirut, and operations started in 1959. An accident occurred in the factory in 1960 which almost killed the minister of public works, and led to the shutting down of the smelter. There were other reasons for this stoppage, outstanding among which was poor planning. The location of the plant as well as the inefficient manufacturing process both contributed to making production uneconomical.

After the accident, the plant remained shut down for six months. Its reactivation was consequently made much more difficult. The 500,000 Lebanese pounds involved in this process of reactivation were too much for the firm, which decided to move into another field. Even if this stoppage had not occurred, foreign competition, mainly East European, would have eventually forced the firm out of business. What the East Europeans were doing was to dump their pig Iron on Middle Eastern markets. This forced the firm to look to the local market.²⁹

²⁹Interview with L. Zacca.

As is known, the Lebanese market is small and would not have been enough to keep the firm going even with vigorous government protection. In any case, the pig iron, although reputed to be of "high quality", was rejected by local users as unsuitable.³⁰

The National Iron and Steel Manufacturing Company then went into the manufacture of cast iron fittings. This project proved unsatisfactory and a law suit is now in progress between the company and the suppliers of the casting equipment. The firm is facing financial difficulties. Because of all these adverse factors and because of the firm's uncertain future the author has chosen to exclude it from his discussion of the contemporary steel industry in Lebanon.

Any discussion of the iron and steel industry in Lebanon today must inevitably center around the country's two firms, namely Lebanon Steel Mill Company, and Consolidated Steel Lebanon S.A.L. Ignoring the virtually bankrupt National Iron and Steel Company, the two above-

³⁰ Interview with O. Kassardjian, owner of Kassardjian Foundaries, May, 1968.

mentioned firms have the potential of producing steel from raw materials starting with ore and scrap. Besides, they are the only ones, with the National Iron and Steel Company, which are categorized in the industrial census of 1964 as heavy industries.³¹

Lebanon Steel Mill Company

This firm situated in the outskirts of Tripoli, was established in 1957. It was only in 1962 that production started. The project is said to have been studied with the aid of foreign experts for two years before final execution. There are reasons, however, to believe that the investment in the project was guided by rule of thumb. The majority shareholders of the company, the Ghandour family, who had some previous experience in industry started importing big quantities of steel from Eastern Europe in the mid-fifties and began selling to local distributors. The difference in the price of steel between Western and Eastern Europe made them think that in the West the firms were making large profits, or

³¹Ministere du Plan, Recensement de L'Industrie au Liban (Beirut: Direction Centrale de la Statistique, 1967), p. 28.

else this price differential could only be explained by higher costs of production. Since labor at the time was cheaper in Lebanon than in Western Europe, and since raw materials could be bought cheaply locally or from the East, they concluded that it would be profitable to manufacture steel in Lebanon. Being new in the field, and wanting to minimize any potential losses, they invested relatively small sums, namely L.L. 3 million, which were approximately doubled few years later. Presently the declared capital of the firm is L.L. 10 million of which only L.L. 5.5 million is fully paid.³²

The original plan of the company was to manufacture steel from local scrap and imported billets. They had bought an electric furnace to melt the scrap. But the quality of local scrap, and the availability of billets at very low prices made the manufacture of steel from scrap uneconomical. The scarceness of skilled workers and technicians was another impediment to the continuation of the production of electric furnace steel.³³ As a result, the

³²Interview with Amin Adib, Sales Manager of Lebanon Steel Mill Company, Beirut, June, 1968.

³³Interview with Sami Sayegh, Metalurgical Engineer, Beirut, May, 1968.

manufacturing process of the factory was reduced to re-rolling imported billets into plain round bars of 10-22 mms. In 1966, they added a new line to their product mix, the manufacture of high tensile strength deformed steel bars. At present, they produce plain round bars 6 mms - 30 mms., and high tensile deformed bars 8 mms - 25 mms. The 6 mm. bars are cut from imported coils. The trade mark of the deformed bars is "twist steel". A law suit is presently in progress against the Lebanese Steel Mill Company for a patent infringement. It is said that the characteristics of "twist steel" are similar to "tor steel", a foreign trade mark.

The firm has two main divisions: the office and the plant. In the latter improvements have been introduced continuously. The capacity of the plant was increased in 1964-65, and the production systems have been improving since then. The rolling capacity of the plant is 120,000 tons a year,³⁴ and the number of workers engaged

³⁴In The Middle East Steel 1967-1969, the rolling capacity of the firm is estimated to be 20,000 tons a year. In the same source it is mentioned that the firm is planning to expand its capacity to 60,000 ton/year.

in the production process is about 400.³⁵ Nowadays, the installation of a merchant bar mill is being considered.

To estimate a business as a whole we should evaluate its marketing program which is defined as: "A total system of interacting business activities designed to plan, price, promote and distribute want-satisfying products and services to present and potential customers."³⁶

The performance of any company is judged by its profitability. This firm was losing money up to the end of 1965. It was only in 1966 that it made profits. Although since then profitability has improved, this change cannot be taken as an indication of better performance.

It would be safe to say that the managers of the firm were poor in planning and forecasting. Moreover, up to this date they do not have a system of "environmental analysis", (i.e., the study of the relationship of profits to some economic indicator outside the company.)³⁷ The

³⁵Interview with Amin Adib.

³⁶William J. Stanton, Fundamentals of Marketing (New York: McGraw-Hill Book Company, 1964), p. 5.

³⁷Joel Dean, Managerial Economics (Englewood Cliffs: Prentice-Hall, 1951), pp. 324-347.

lack of manufacturing planning, which "deals with the processing and fabrication of products",³⁸ is a well known feature of the firm. Good factory planning, the study of new industrial buildings, modification of the structures, utilities and services needed, and plant layout, are practically non existent. Such planning would have resulted in reductions in costs, more efficiency, better service to customers, higher morale, lower turnover among employees, and fewer management problems.³⁹

Unfortunately, industrial hygiene is lacking and there is a lack of awareness for the conservation of the health of the worker. The factory does not have adequate plant sanitation, and occupational hazards are numerous. In such an environment, it is not possible to maximize the creativity and commitment of the worker.⁴⁰

The "allocative function of transportation rates"⁴¹ have been overlooked. The main market for their product is in Beirut and its surroundings. It logically follows

³⁸E.H. Maclliece, Production Forecasting, Planning and Control (New York: John Wiley & Sons, Inc., 1951), p. 5.

³⁹William G. Ireson, Factory Planning and Plant Layout (New York: Prentice-Hall, Inc., 1952), pp. 294-295.

⁴⁰Harold J. Leavith, "Unhuman Organizations", Harvard Business Review, (July-August, 1962), p. 90.

⁴¹Marvin L. Fair and Ernest W. Williams Jr., Economics of Transportation (New York: Harper and Brothers, 1959), p. 505.

that the plant should have been situated somewhere near Beirut. The actual location does not give any particular advantage as far as raw materials, labour or transportation in costs are concerned. Although handling charges in the harbour and municipal taxes in Tripoli are less than in Beirut, yet the advantages accruing from this differential are not equal to the higher costs of transportation incurred.

The general accounting system used in the firm is not proper. The way in which the balance sheet of the company is presented in the official gazette of July 10, 1967 is an indication. Their cost accounting system, which practically does not exist, is ineffective. They do not know the costs incurred in producing a certain lot, nor can they calculate the costs to be allocated to a certain line of production. Such a system cannot possibly assist management in bringing and keeping costs down to what they should be.

According to accepted engineering practices, the round bars used for reinforcements in concrete should be straight before loading and uniform in cross-section and material. Although the quality of steel of the Lebanese Steel Mill Company is gradually improving, it still lacks

many of these characteristics. Unloading and storing costs to distributors are increasing due to the crookedness of the bars; furthermore, straightening them costs L.L. 2-3 per ton. The straightened bars are not homogeneous in property and cross-section, because some parts receive cold working while straightening. The edges of the bars are not cut properly. A tolerance of a maximum of 10 cms. above or below the specified length of the bar is generally acceptable. This tolerance limit is not kept in the company.

It may seem intriguing to the reader that with all the drawbacks mentioned, the company has managed to improve its profitability. As will be shown later, this betterment is mainly due to an increase in duties on imported steel bars.

Consolidated Steel Lebanon.

Consolidated Steel Lebanon was established in 1960. Its capital of L.L. 10 million is privately held. The plant is situated on the coast at Amshit, halfway between Tripoli and Beirut. Currently, the company employs 300 workers.

The original plant, which started producing in 1962, was designed for a capacity of 50,000 tons of steel

from scrap and 100,000 tons of rolled products.⁴² To refine the scrap they had purchased a hot blast cupola which was soon found to be unsuitable for the process involved. In any case, the availability of very cheap billets had rendered the manufacture of round bars from scrap uneconomical. The output of the factory is plain round bars and deformed high tensile bars, marketed under the European trade mark, Tentor, in dimensions of 8-32 mms.

Although there was an original investment plan, the plan itself was badly conceived because the owners of the factory tried to install a plant in Lebanon with Western standards in mind. There was no proper prior assessment of the feasibility of such a scheme. In the fixed capital investment, too much emphasis was given to external transportation facilities. It is the opinion of the author that a harbor is a luxury for a firm of this size. The purchase of improper equipment, as shown above, is another example of bad planning and mismanagement.

A further difficulty faced by the company was the unavailability of skilled and semiskilled labor. To cope

⁴²Interview with Miguel Abizeid, Manager of Consolidated Steel Lebanon.

with the situation, a training program was established which proved unsuccessful. The frustration of the manager is clearly illustrated by his statement, "Trained people are difficult to find in Lebanon. The Lebanese are not trained for industry. All workers like to have authority without responsibility."⁴³

It would not be fair to suggest that a substantial part of the difficulties of the company was the direct consequence of the qualitative and quantitative poverty of the labor force; management should also share the responsibility. It is known that workers were sometimes taught the wrong procedure and proper results were expected of them. The firm introduced some ill-timed activities, such as the organization of athletic teams and movie shows to boost employee morale at a time when even production was not properly planned.

As far as the present day running of the business is concerned, the route from operation to operation is properly designed and there is no backflow. Improvements are continuously introduced in factory procedures.

⁴³Interview with Miguel Abizeid.

The percentage of output value to cost value of plant employed has increased. The percentage of the cost of waste and scrap to output value has been reduced in 1967 with an improvement of about 3% over that of 1966.⁴⁴

The factory manager together with the sales manager plan the production. A daily report about the activities in the plant is submitted to the management. Although their reporting and data-keeping systems are not sophisticated enough to show the relationship between materials ordered, materials available, and quantities computed, they are planning to chart and graph all these variables in the near future.

An industrial engineer is responsible for making time and motion studies. His suggestions, however, are seldom carried out mainly because workers are not change-oriented. The rolling mill which has a 20 ton/hour capacity is totally mechanized. The internal transportation is mechanized as well. Particular importance is attached to weighing the output, since a 1% difference is weighing

⁴⁴The questions put to Mr. Abizeid were guided by J.A. Scott's book The Measurement of Industrial Efficiency (London: Sir Isaac Pitman, 1950).

may affect their revenue by about L.L. 200,000.

Special attention is given to quantities of stock to be kept on hand, be it of finished goods or of raw materials. Under normal conditions, the size of the store is optimal. The inventory turnover averages about 12 times a year. Due to the June war of 1967, this figure has fallen to 6. As a result, the inventory figures have increased tremendously causing storage problem.⁴⁵ Goods are issued from the stores on a first in first out basis in order to minimize loss of value due to rusting. A perpetual inventory system enables the managers to estimate the difference between physical stock counts and recorded stocks thus making it possible for them to evaluate the cost of stock losses arising from damage and deterioration. Process cost accounting with full standards is employed in the factory which enables the managers to evaluate the cost of idle capacity and to find out lines of best profit. An autonomous group inspects materials in

⁴⁵The inventory turnover figures, which were given by the manager of the firm, do not seem to be correct. A turnover of 12 times may be ideal but practically unattainable. It may be said with some certainty that the firm has never attained that ratio.

process and finished goods. Theoretically, nothing goes out of the factory without inspection. It is worth mentioning here that the technical characteristics of the high tensile strength deformed bars are not as good as those of the Lebanon Steel Mill Company.⁴⁶

In its day to day operations, the firm is better organized than the Lebanon Steel Mill Company. Its overall condition, however, is worse than that of the latter, mainly due to its financial weakness. The balance sheet of the company was not available to the author. However, reliable sources, who prefer not to be quoted, estimate its accumulated losses at around L.L. 8 million. Consolidated Steel is indebted to a bank by L.L. 13 million. It is not well known as to how it utilized this amount. In fact, it got the loan on a short term basis. Finding itself in difficulty, it arranged to pay in installments starting August 1968 for fifteen years, and paying one million Lebanese pounds per year with an interest of 3%. The machinery and equipment of the firm is mortgaged to this bank, while its inventories are mortgaged to another bank. It is worth mentioning that the land on which the

⁴⁶ Interview with A. Jabr, Engineer and Sales Manager of "Tor Steel."

factory stands is leased from the government.

Can consolidated steel overcome its problems and debts by regular continuous production and adequate income? The question remains unanswered, but the author doubts this very much.

CHAPTER III

STEEL MARKET IN LEBANON

While analyzing the market for an industry, the discussion should center around the market structure, conduct and performance of the industry. In the absence of a proper steel industry in Lebanon, the discussion of this chapter will be limited to the two manufacturing firms and the distributors involved in selling steel.

Levels of Middlemen

The length of the channels of distribution in Lebanon depends upon the type of steel market knowledge, the financial strength of the purchaser, and the type of user. The shortest path would be when the ultimate consumer buys directly from the producer. This may happen in few instances, for example, when an industrialist buys a special kind of steel. In the longest path the ultimate consumer would have paid for the services provided by four or five middlemen. (See fig. 1).

In Lebanon the channels of distribution for round bars are different from those for other types of steel as noticed in figs. 2 and 3.

As far as round bars are concerned, the factories import billets through a broker, though direct purchases from foreign producers are not unusual. Some 75% of their sales are to industrial distributors and the rest to the ultimate user such as exports, construction, government and industry.

Finished round bars are still imported by the merchants. This may amount to about 30% of total round bar consumption in Lebanon.

As far as other steel products are concerned most of the imports are done by distributors through local brokers or agents. About 75% of these imports are sold directly to the users.

Concentration

In Lebanon there are about 100 business units that are in the steel business. Geographically they are

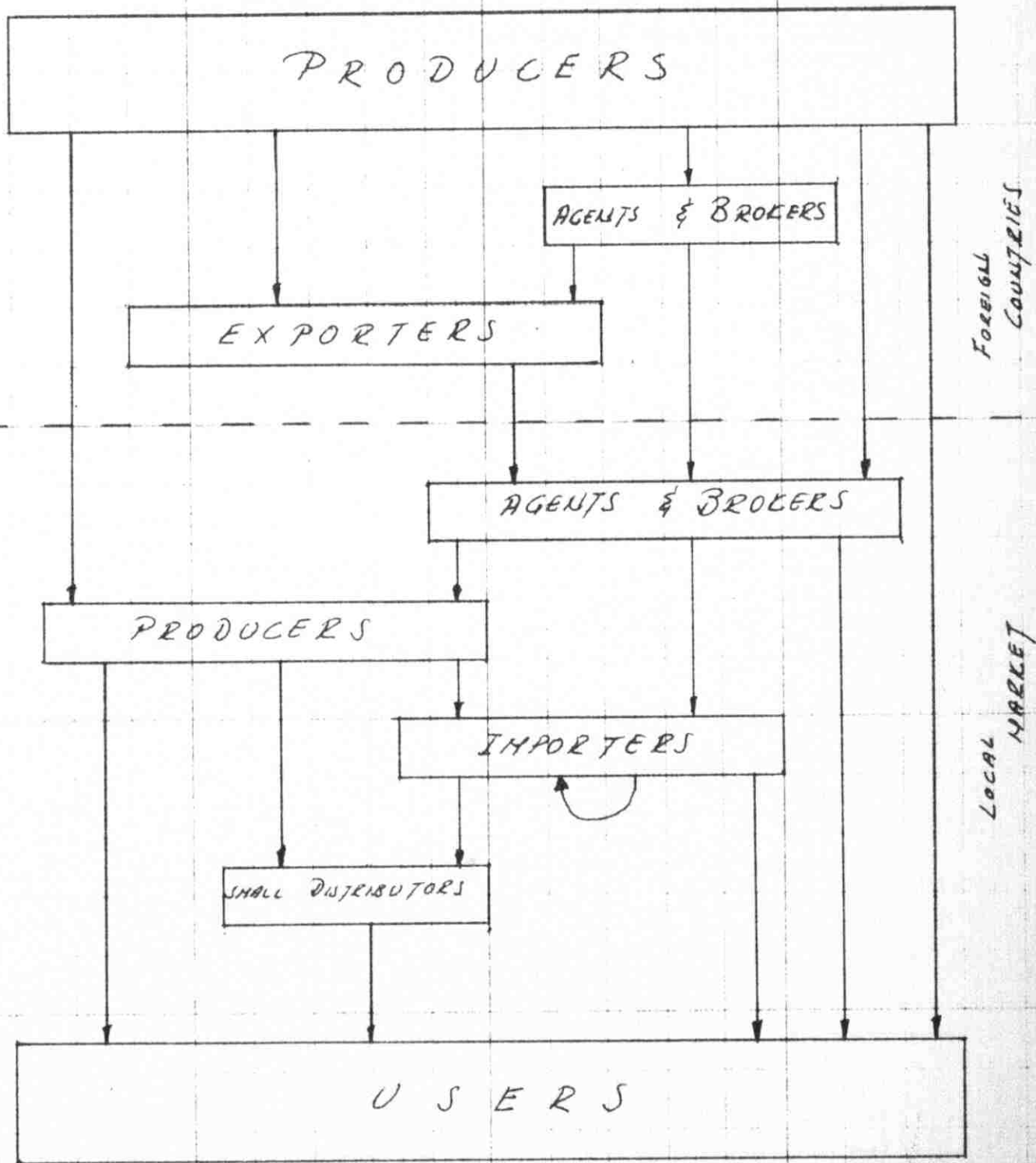


Fig. 1: Steel market in Lebanon, levels of middlemen in general

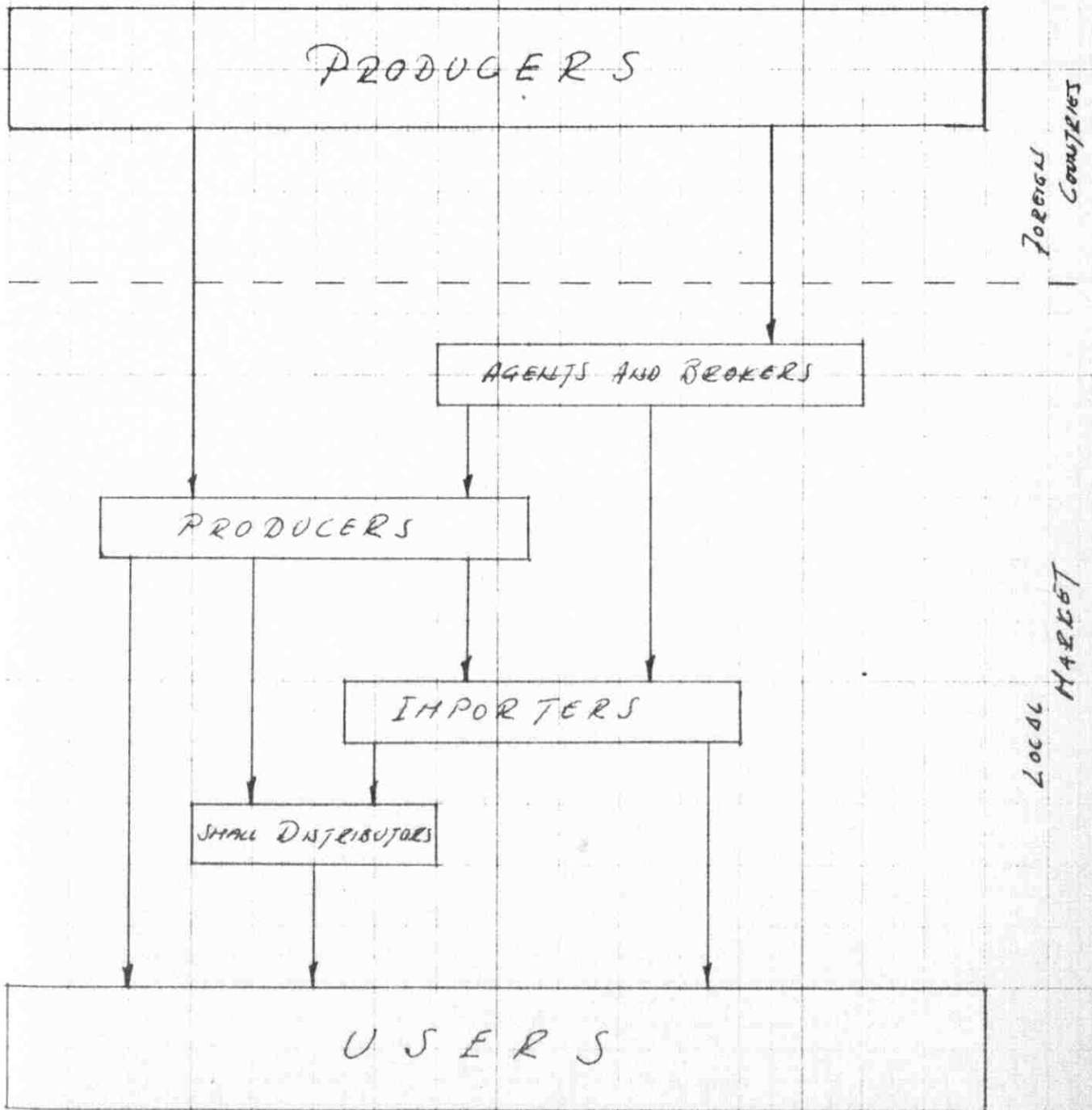


Fig. 2: Steel market in Lebanon. Main levels of middlemen for round bars.

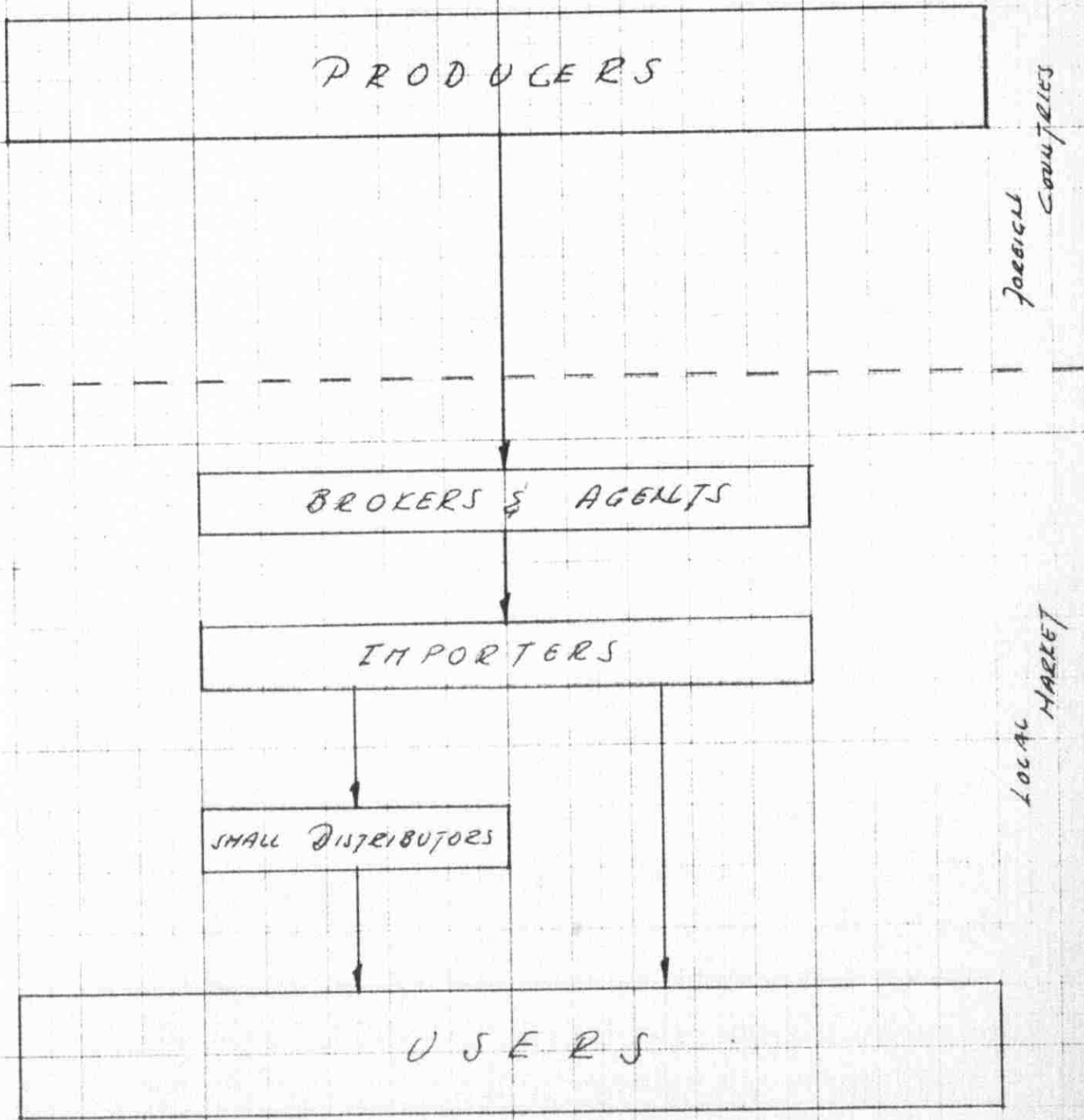


Fig. 3: Steel market in Lebanon, main levels of middlemen for products other than round bars.

distributed as follows.¹

Beirut and Surroundings	30
Tripoli	16
Jbeil	5
Saida	10
Nabatieh	3
Baalbeck	5
Rayak	3
Mansourieh	1
Jezzine	2
Kabelias	1
Shekka	3
Sour	2
Ghazir	2
Zahleh	15
Jounieh	2

Out of these 100 business units there are 10 which could be considered as important firms all of which are situated in Beirut. These 10 firms by themselves account for more than 80% of all steel transactions in Lebanon. There are also about 10 important brokers and factory agents stationed in Beirut. The

¹The information is obtained from Mounir Bassil, sales manager of Consolidated Steel Lebanon.

turnover of each is more than 1000 tons/year and indicates their importance. Practically all import trade is handled by them.

The big steel merchants of Lebanon exhibit a certain degree of specialization. Some specialize in the sale of round bars, some in the sale of plates and sheets while other forms of steel are sold only by few traders. Thus on a certain date the same merchant can be an oligopolist in one branch of the steel trade, and a monopolist in another branch. On another date this same merchant could be a monopolist in the field in which he was an oligopolist, and vice versa. The distinction between an oligopolist and a monopolist in the steel market in Lebanon is a short run distinction. The only field of trade that nowadays shows the characteristics of an oligopoly is that of round bars. But more and more merchants are dropping this line of activity and shifting to other fields.

As with the sellers, the buyers also cannot be lumped into one single homogeneous group. For certain forms of steel, such as round bars, there are many customers e.g. building contractors, the government, screw,

nut, and bolt manufacturers, and shoe heel manufacturers. The customers for sheets are fewer, and include the metal shops, metallic furniture manufacturers, air conditioning unit manufacturers and installers, refrigerator manufacturers, and bus and truck body makers. Bars, other than round bars, are demanded by steel frame constructors, and door and window manufacturers. For marine plates and heavy plates, buyers are even fewer. These are the boiler manufacturers, tank manufacturers and barge manufacturers. Thus one may find an oligopoly, a duopoly or a monopoly confronted with many customers, an oligopsony or a monopsony. The implications of such a market structure cannot be discounted directly, since the distributor has usually stronger bargaining power due to his financial strength and the urgency of the need of the customers.

Barriers to Entry

Keeping Lebanese standards in mind, the barriers to entry into round bar processing in Lebanon are high. These include overcapacity of the existing firms, the L.L. 5 million or so invested in fixed assets, and a similar

amount to be invested in working capital. As far as trade is concerned, though barriers are lower, an importer would need a capital of around L.L. 1.5 - 2.0 million. Even though there has been entries to the steel distribution sector, the entrants were usually Syrians who were conducting the same line of activity in their country. A further barrier to entry is the merchants' profit margin. On round bars, which constituted most of the trade in steel, profit margins have fallen to about L.L. 5-10 per ton. As a result the more successful steel merchants have shifted their specialization to other fields.

Although on the surface any special kind of knowledge seems to be unnecessary, yet it is observed that a more successful firm has better market knowledge (as far as both supply and demand are concerned), better accounting systems, and better inventory control systems. The better-organized firms export or reexport and sell in transit more than others. Technical knowledge has been important. "Tor steel" was introduced into the market by an engineer. His remuneration has been more than "good".

Another engineer introduced special sections. The profit margins on these items, nowadays, are much larger than on current items. Technical knowledge, though not an important barrier, has at least helped in attracting new customers to the distributor. Steel being used in engineering projects, the designer finds it easier to communicate with a merchant who "speaks his language."

Import, Export, and Local Trade

The trading process which can be assumed to start with the user will be examined. The customer may have a preferred merchant or merchants with whom he has been doing business for a time. This tie is usually strong, since for a constant customer the distributor has a current credit account and only in case of a drastic change would the customer turn to a new trader. This is very true for several contractors and industrial users. If the buyer is new in the market he would go and ask for quotations from different sources and buy from the lowest bidder. Some institutional buyers, such as the army, would always ask for bids before ordering any quantity.

The fluctuations in price and the facilities offered depend upon the type of steel and the customer. For round bars the price is uniform all over the market and prices do not vary by more than L.L. 5/ton. The difference between factory prices and the market prices is usually around L.L. 10/ton. Factory sales to distributors are usually for cash. The credit facilities offered by distributors do not exceed a period of six months, two months being usual. Items other than round bars have a higher margin of profit. The price fluctuations of L.L. 20-30/ton are common. As far as credit facilities are concerned the terms given for round bars apply here also.

Inter-merchant trade amounts to about 25% of total sales. The terms given by big distributors to smaller ones are different from those given by big distributors to each other. The relationship existing between the big and small merchant is a wholesaler-retailer one. Usually the small trader gets lower prices and more credit facilities. Balances between big distributors are settled weekly, and usually at prices ruling in the market.

As soon as a customer contacts a distributor for a big order, the merchant would try to order a similar

quantity. If the demand is for round bars, the order is usually passed directly to a factory. The latter would most probably supply the customer within two or three days. Thus distributors are generally reducing their inventories of round bars, and the turnover of round bars to the distributor has been increased. It is estimated that an efficient merchant may have an inventory turnover in round bars of as high as six times per year, whereas few years ago this figure would not have been more than three.

All the other forms of steel are imported. The importer usually contacts a broker or a factory agent, who receives a commission of about 1.5 - 2%. Their commission is reduced, on big quantities, or shared with the importer. A minimum of one month and a half is required for the goods to arrive to Lebanon, two months and a half being a good average. The delivery period depends upon the type of steel, the source and its distance from Lebanon. The turnover of imported steel is generally lower than that of round bars purchased locally. The average turnover would be around 2.5/year. Certain items may have a turnover figure as low as one half per year.

Most of the steel import trade in Lebanon is with East European countries, because prices offered in these countries are on the average about 10% lower than those of Western Europe. The credit facilities offered by exporters to the Lebanese importer have improved. Whereas a few years ago the importer had to give a confirmed irrevocable letter of credit, the usual terms now are cash against documents. Some exporters even give credit facilities of about three months. For big orders (500 tons) a quantity discount of 2% is expected.

It is generally accepted that steel in Lebanon is imported for immediate consumption or to be consumed in the near future. However, this is not always true. In at least one of the factories, it is thought that the cost of idle capacity is more than the cost of tying up capital in inventories. Thus, even with low levels of demand for round bars, billets are imported into Lebanon. Merchants, who are also particular about their inventory levels, tend sometimes to overstock. This is especially true when it is felt that prices have hit bottom. The relatively high steel "consumption" figure in 1958 (see Table 13) may be explained by the low international

TABLE 13

STEEL CONSUMPTION IN LEBANON
(IN THOUSAND METRIC TONS)

<u>Year</u>	<u>Quantity</u>
1953	76
1954	109
1955	167
1956	140
1957	135
1958	178
1959	185
1960	182
1961	192
1962	161
1963	211
1964	239
1965	253
1966	296

Source: United Nations, Statistical Yearbooks 1958-1967
The data relate to the apparent consumption of
crude steel, i.e., production plus imports minus
exports.

export prices of that same year (see Fig. 1). Special discounts and extra facilities to the Lebanese retailer will have the same effect as prices. Therefore it would not be wrong to conclude that beyond a certain normal price fluctuation, imports of steel are price elastic, but normally it is price inelastic.

The demand for steel exports or reexports from Lebanon is limited both as far as the nature of demand and quantity are concerned. Neighboring Arab countries, towards which most of our steel exports are directed, purchase steel from Lebanon in case of an urgent need. But as the services provided by the local middlemen in the Arab countries improve and their market knowledge becomes better, exports from Lebanon may show a relative decline. Furthermore, several Middle Eastern states have local steel industries. This, coupled with the emergence of steel industries in Pakistan, India and Japan may affect the Lebanese steel export trade.

Bars constitute the main portion of steel products in Lebanon. The secular trend in this field has remained practically constant. However, if one bears in mind that

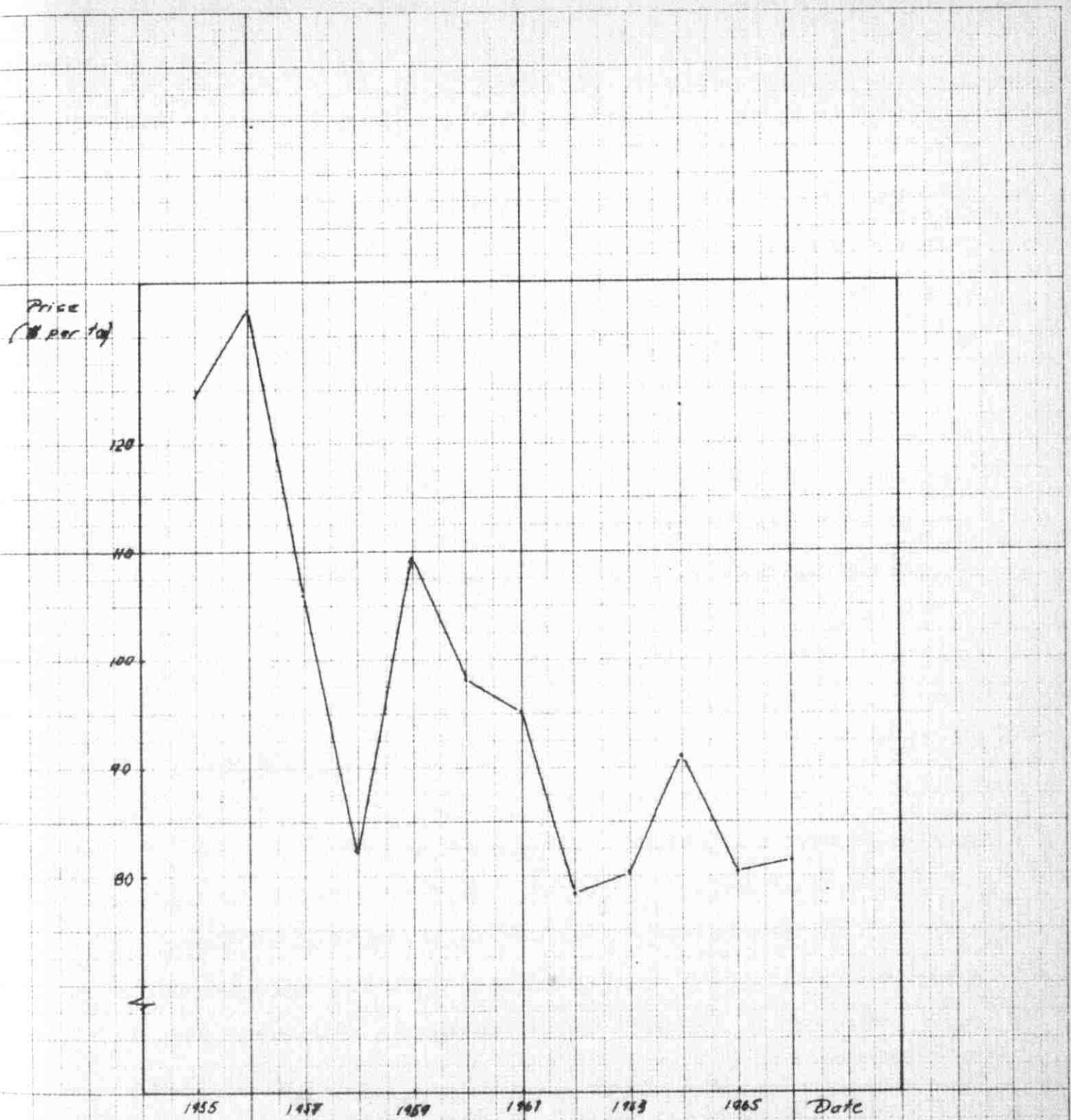


Fig 4 : Export price of merchant bars f.o.b. Antwerp.

Source: Financial times, Monday, June 17, 1968, p. 9.

billets are rolled into round bars, and that starting with the 1960's plain round bars were substituted for by high tensile deformed steel bars,² one can see that there has been a significant growth in this secular trend. Angles, shapes and sections constitute the second important group as far as trade is concerned. Their values have remained constant over the period involved while the value of plates and sheets has doubled during the same period. Special steels, which are newcomers to the market, have registered a marked rate of growth. Trade in other steel products is also increasing.

Market Conduct

"The importance of market structure lies in the way it induces firms to behave. Their behavior in changing prices, outputs, product characteristics, selling expenses, and research expenditures we shall call their market conduct."³ In assessing the conduct of the steel mar-

²High tensile deformed steel bars carry about 40-50% more loads than a plain round bar of the same dimension. Nowadays 35-40% of total round bar consumption in Lebanon is steel of this type.

³Richard Caves, American Industry: Structure, Conduct, Performance (New Jersey: Prentice-Hall, 1967), p. 37.

TABLE 14

LEBANON: IRON AND STEEL IMPORTS
(IN METRIC TONS)

	1961	1962	1963	1964	1965	1966
Pig iron	7079	4095	6113	7150	10868	10371
Ferro-alloys	581	307	548	1294	561	70
Scrap	7675	1699	2708	11589	5345	700
Shot	8	5	32	15	29	11
Powders	-	-	2	2	9	-
Blooms and billets	40	2678	42082	29606	32475	80594
Sheet bar	2	1	1	38	9	1
Flat bar	30	3	69	109	35	12
Rods and bars	105459	73931	72515	92448	81427	97139
Angles, shapes, sections	30351	24305	38378	37226	41172	28744
Hoop and strip	9734	8701	11248	12976	8772	12208
Plate and sheet	12601	10413	15457	18499	21609	23514
Tinplate	4084	3509	3497	4308	5071	5431
Galvanised sheet	2700	1847	1627	4471	3904	2643
Wire	5634	4049	5880	5632	6483	6159
Special steels	13	212	521	385	620	1097
Railway materials	156	18	174	754	1360	543
Cast iron pipes	1105	1221	5191	1218	1531	2266
Steel pipes	6735	9197	11235	8827	8340	11209
Pipe fittings	1047	1029	1336	1026	1291	1348

Source: Computed by the author from the Lebanese Statistical Yearbooks of import-export trade 1961-1966.

TABLE 15
LEBANON: IRON AND STEEL EXPORTS
(IN METRIC TONS)

	1961	1962	1963	1964	1965	1966
Pig iron	14	45	69	38	-	-
Ferro-alloys	380	665	89	585	-	-
Scrap	3858	2109	157	871	-	-
Shot	2	-	1	9	-	-
Powders	-	-	-	-	-	-
Blooms and billets	-	-	33	8	-	-
Sheet bar	-	-	-	2	-	-
Flat bar	26	8	4	39	-	-
Rods and bars	512	1262	5051	3466	11900	-
Angles, shapes, sections	71	357	365	457	445	-
Hoop and strip	19	24	61	15	-	365
Plate and sheet	147	139	124	76	60	1680
Tinplate	25	101	112	271	108	-
Galvanised sheet	3	21	21	17	-	-
Wire	14	8	9	71	-	-
Special steels	-	1	-	-	-	122
Railway materials	42	100	209	818	-	-
Cast iron pipes	539	473	324	259	659	87
Steel pipes	2294	2666	1254	2932	2259	1495
Pipe fittings	1234	1925	2486	3211	3113	-

Source: Same as Table 14.

ket, behavior as far as output, product characteristics, selling expenses and research expenditures is not important. The only variable we are left with is pricing. Do the firms in the market have policies toward their product prices?

Each category of steel is quoted in the market place at a "basic price". For example, the basic price of deformed bars would be different from the one for round bars. Furthermore, an extra amount, which is supposed to represent the differential costs incurred in producing the various dimensions of the same category, is added to the basic price and the price for a certain bar dimension is gotten.

There is a similarity between European extras and Lebanese extras. Nevertheless they are not identical. Few years ago, the extras in Lebanon were reviewed by the importers. In the new extras the turnover of the different dimensions were taken into consideration. As to the basic prices, an attempt is done to find a relationship between European export prices and Lebanese market prices. In the absence of a steel price index in Lebanon, basic prices

for plain round bar products quoted in Lebanese pounds would be compared with European export prices in dollars (see Tables 16, 17 and 18). The dollar exchange rate of the Lebanese pound is assumed to remain constant all through the period involved.

There is a high degree of correlation between local and European prices (see Fig. 5). The coefficient of correlation R , computed by using the least squares method, the coefficient of determination R^2 , the slope of the straight line B with its standard error of estimate \sqrt{B} , and the coordinate at which the line cuts the Y axis A , are given in Table 19 below.

When Lebanese current prices are correlated with those of Europe two months earlier, the highest degree of correlation is obtained. Most probably prices in Lebanon lag behind those of Europe by about two months. Furthermore, a ^{marginal} dollar worth of round bars in Europe has been sold in Lebanon at around L.L. 3.85 to 3.90 (see the B 's of Table 19). Assuming a dollar exchange rate of L.L. 3.10 per dollar for the period involved, and an average transportation and insurance cost of \$8/ton equivalent to about

TABLE 16

LEBANON: MONTHLY STEEL MARKET PRICES
(LEBANESE POUNDS/TON)
1961-1966

	1961	1962	1963	1964	1965	1966
January	365	335	280	285	295	295
February	365	330	275	290	295	295
March	365	350	270	320	295	295
April	355	350	270	340	290	350
May	360	300	270	340	290	305
June	360	285	280	340	295	305
July	355	280	285	340	295	300
August	350	275	280	340	295	300
September	355	270	285	330	290	300
October	350	265	285	310	295	305
November	350	270	285	300	300	305
December	340	275	285	295	295	305
Yearly Average	356	290	279	319	294	307

Source: Mr. Mounir Bassil, Consolidated Steel Lebanon.

(The yearly average is found by dividing the sum of monthly prices for a year by 12).

TABLE 17
LEBANON: MONTHLY STEEL MARKET PRICES
(LEBANESE POUNDS/TON)
1955-1960

	1955	1956	1957	1958	1959	1960
January	410	440	455	390	310	410
February	420	440	455	355	320	450
March	410	440	455	340	335	380
April	410	435	450	330	335	375
May	400	440	450	320	340	375
June	395	430	440	320	370	375
July	395	425	435	320	380	400
August	410	425	430	320	390	400
September	430	435	430	320	390	390
October	430	435	430	320	410	375
November	440	450	430	320	410	375
December	445	435	430	315	420	375
Yearly Average	416	436	441	331	367	386

Source: Messrs Boulos Fayad and Sons and other private sources.

(The average yearly price is calculated by dividing the sum of the monthly prices by 12).

TABLE 18
CONTINENTAL STEEL EXPORT PRICES
(DOLLARS/TON)
1960-1966

	1960	1961	1962	1963	1964	1965	1966
January		95	78	71.5	76	81	74.5
February		95.5	75.5	71.5	77.5	82	77.5
March		92.5	74.5	70.5	81.5	81	77.5
April	99	89.5	71.5	71.5	84	80.5	77
May	99	89.5	71	72	85.5	81	75.5
June	101	90.5	71	73.5	85.5	79.5	74.5
July	100	87.5	71	75	84.5	77	73
August	99	84.5	73	75.5	83.5	76	73.5
September	95.5	81	74.5	76.5	83	73.5	73.5
October	91.5	79.5	73	76	83	71.5	72
November	86	81	71.5	75.5	81.5	71.5	71.5
December	89	81	71	75.5	80.5	74.5	72

Source: Metal Bulletin's appraisal of continental (European Carbon and Steel Community) Mills' export prices for ordinary commercial quality round bars around the middle of the month.

Price in L.L.

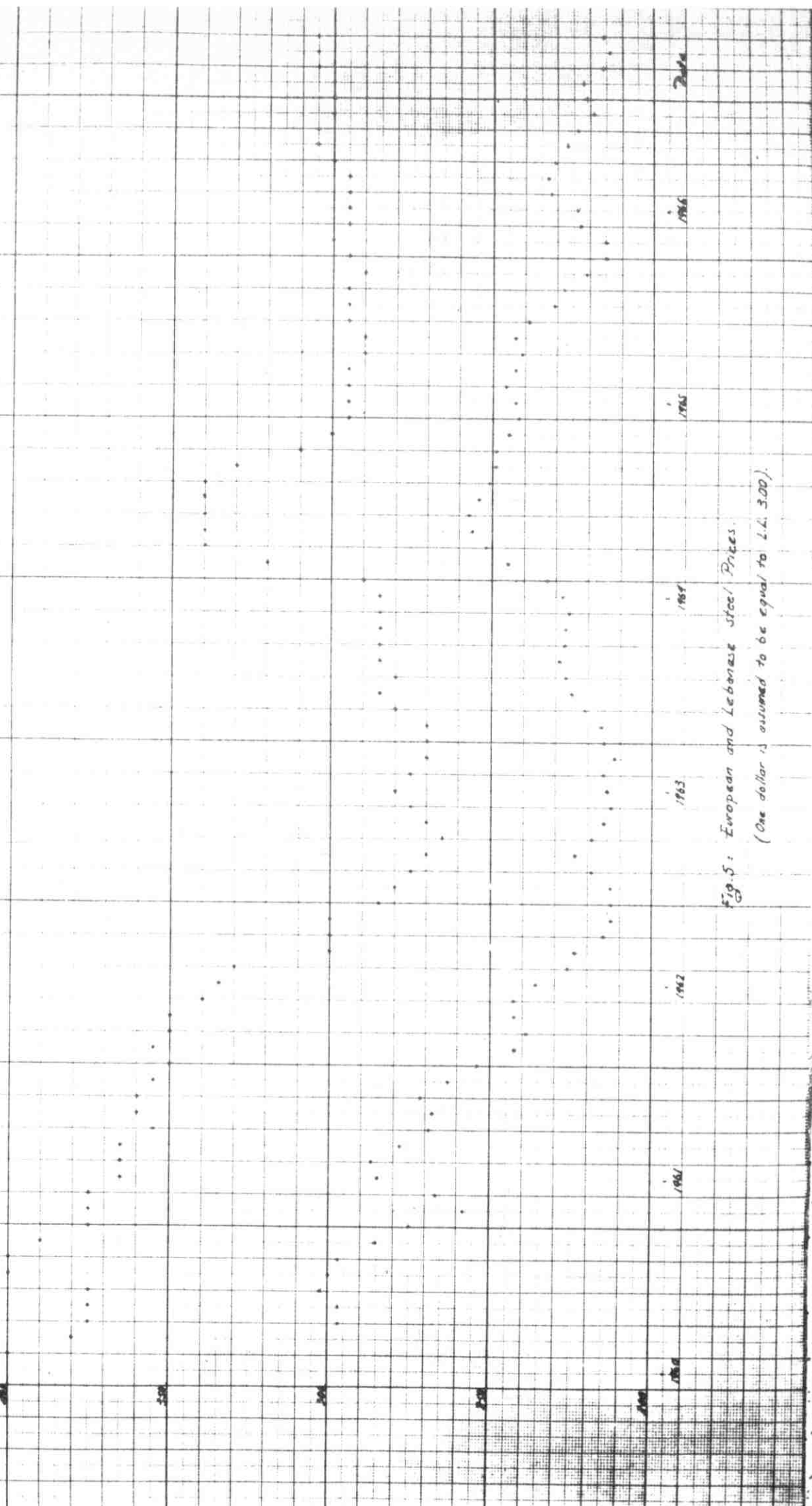


Fig. 5: European and Lebanese Stock Prices.
(One dollar is assumed to be equal to L.L. 300).

1961 1962 1963 1964 1965 1966

TABLE 19

LEBANESE PRICES VS. EUROPEAN PRICES

VALUE OF A, B, B , R^2 , R

April 1960 to Dec. 1966

	A	B	\sqrt{B}	R^2	R
Lebanese Current Prices vs. European Current Prices	3.693	3.895	0.226	0.785	0.886
Lebanese Current Prices vs. European Prices of a month earlier	1.672	3.900	0.213	0.808	0.899
Lebanese Current Prices vs. European Prices of two months earlier	3.561	3.868	0.210	0.812	0.901
Lebanese Current Prices vs. European Prices of three months earlier	10.325	3.770	0.218	0.792	0.890

Source: Computed by the author.

31 piasters per dollar (average price/ton = \$80)*, the total cost of a dollar worth of product would be L.L. 3.40 in Lebanon. Selling and administrative expenses, as estimated by the author, would average about L.L. 15/ton equivalent to 19 piasters per dollar. The inventory

*The price differentials between Eastern and Western Europe are approximately equal to the import duties on round bars.

turnover being around 2.5 per year, the fixed investment in inventory would be $\frac{3.40}{2.5}$ per year. Since most of the working capital of the firms is of borrowed money, the interest charge incurred would be $\frac{3.40}{2.5} \times 7\%$ which is about 10 piasters per dollar. The net profit to the distributors during the period involved is, therefore, about L.P. 25-30 per dollar or L.L. 20 - 25/ton.

Correlating the monthly prices but taking each year separately would yield to the results given in Tables 20 and 21.

Up to 1962, the highest coefficients of correlation are found when European prices are assumed to lead Lebanese prices by two months. As a consequence of the entry of the factories into operation, and the price agreement reached amongst twelve distributors (discussed later in this chapter), the lead-lag time between European prices and local prices seems to have vanished. This is indicated by the fact that the highest coefficients of correlation for 1963 and 1964 are calculated when current prices in the two areas mentioned above are correlated.

TABLE 20

LEBANESE PRICES VS. EUROPEAN PRICES

COEFFICIENT OF CORRELATION

EACH YEAR TAKEN SEPARATELY

	1960-61	1962	1963	1964	1965	1966
Lebanese Current Prices vs. European Current Prices	0.780	0.633	0.870	0.906	0.348	0.643
Lebanese Current Prices vs. European Prices of a month earlier	0.816	0.780	0.810	0.727	0.410	0.329
Lebanese Current Prices vs. European Prices of two months earlier	0.820	0.866	0.759	0.478	0.411	0.212
Lebanese Current Prices vs. European Prices of three months earlier	0.807	0.869	0.659	0.233	0.401	0.445

Source: Computed by the author.

TABLE 21

LEBANESE PRICES VS. EUROPEAN PRICES

COEFFICIENT OF DETERMINATION R^2

EACH YEAR TAKEN SEPARATELY

	60-61	62	63	64	65	66
Lebanese Current Prices vs. European Current Prices	0.610	0.400	0.756	0.820	0.120	0.413
Lebanese Current Prices vs. European Prices of a month earlier	0.665	0.609	0.656	0.529	0.168	0.108
Lebanese Current Prices vs. European Prices of two months earlier	0.673	0.786	0.576	0.229	0.170	0.045
Lebanese Current Prices vs. European Prices of three months earlier	0.652	0.755	0.434	0.054	0.160	0.198

Source: Computed by the author.

The correlation figures up to 1964 are high. In 1965 the coefficient fell to 0.35. Two reasons may be given for this decrease: the expectation of an increase in the import duties on round bars which actually occurred in September 1965, and second the cancellation of the

agreement reached amongst the distributors of steel. In 1966 the fact that the coefficient of correlation persisted to be low may be due to the relatively high protection given to the local steel industry. The protective tax cushion seems to have been absorbing most of the price fluctuations in Europe (see Fig. 5).

The implicit policy in pricing round bars in the market place is to follow European prices. This does not rule out agreements amongst sellers. The declining profits of the steel merchants of Beirut pushed them to get together and agree on a policy of putting competition aside. In May 1963, an agreement was reached amongst twelve leading round bar merchants. The price of round bars was fixed at a level of L.L. 15 - 20 above the current steel price in the market. Besides, all merchants in the agreement remitted L.L. 17/ton to a distributor's "common fund" on bars imported from Western Europe and/or purchased from local factories; and L.L. 20/ton on all imports from Eastern Europe. Balances in the fund were distributed to the merchants quarterly at predetermined fixed percentages. Lastly, each merchant in the agreement had

to buy a specific quantity from the local factories. The agreements reached by the distributors affected not only their sales policy but their purchases policy as well. The differentials in the remittances to the fund, and the contract that bound the distributors to buy practically all the output of the factories, were controlling their purchasing habits. On the other hand, profit per ton of round bars being about L.L. 20/ton which was, for all practical considerations, equal to the remittances to the fund, it did not matter much who of the merchants sold the bars. Furthermore, as a result of increased margins of profit, smaller firms which were not in the agreement benefited too. Not being bound by the terms of the agreement, their market share increased.

This condition lasted for a year and three months. There were many reasons why it did not continue. As far as the Lebanese market is concerned, the factories had vouched to sell their production only to the merchants who had signed the agreement. This promise was not kept. Some merchants became unhappy with their predetermined fixed ratios on the basis of which the "fund's" balances were going to be distributed. Lastly, there was fear

of new entries into the steel distribution business. As a matter of fact, those who were outside the "pool", profiting from higher margins, imported large quantities of steel. By cancelling the agreement, prices would have dropped and smaller distributors would have been coerced out of the market.

For items other than round bars, prices in Lebanon more or less follow the European trend. But for non-current lines, as expected, price fluctuations may be as high as L.L. 300/ton. It is usually in these lines that several distributors try to sell the product at agreed prices. Cases of price leadership are not uncommon. The price leaders are the big distributors. Coercive measures have been taken, sometimes, to tame or eliminate a rival.

In Lebanon, the market structure affects the conduct of the firm in steel business and vice-versa. It will be seen that the two together affect the performance.

Performance

The performance of an industry in the economy can be measured by its efficiency, the employment opportunities

it provides, its progressiveness, and the income distribution resulting from its activities. In this connection, distributors and manufacturers will be treated separately. The two groups exhibit different traits which could not be discussed together.

The nature of the steel-trading business does not provide for employment opportunities as much as manufacturing does. In a typical steel-trading firm in Lebanon, profit figures are usually at least twice as high as the wages and salaries paid to employees. Profits per ton of round bars averaged around L.L. 20.⁴ Yet the author estimates that for the same period the wages and salaries paid per ton do not amount to more than L.L. 10. As far as progressiveness and efficiency, each business unit in the market possesses a different character. Some of the top-ranking firms only a few years ago have gone down the scale. The successful firms, those which are efficient and progressive, have a better accounting system, a better inventory control system, and more dynamic and educated management. Though their main strength lies in their financial power,⁵ unlike other

⁴See discussion on market conduct.

⁵See Salim A. Hoss, "Economic Concentration in Lebanon," Middle East Economic Papers 1963 (Beirut: Economic Research Institute, 1963), pp. 55-74.

distributors and retailers, they have a relatively high degree of specialization.

The part to be played by the stockist⁶ in the future depends, to a great extent, upon the performance of the existing manufacturing firms. Most of the services rendered by the distributors⁷ could be easily assumed by the factories. If in their actual channels of distribution the merchants play a leading role, there are two main reasons for this: first, because the manufacturers do not have the ability to undertake the financial burden of selling on credit, and second the distributors, at least some of them, have enough inventories to retaliate against any unilateral action taken by the factories. In the future there may be more concentration in the trade of round bars.

In fields other than round bars the position of the stockist is still unchallenged. Potentially, the existing factories, or new ones may manufacture merchant bars, but it is doubtful whether they will produce sheets and plates.

⁶A term used for a steel merchant.

⁷For information on services rendered by distributors, see Metal Bulletin's special report on Steel from Stock, May, 1964.

What have the manufacturers been doing? Here our attention should center around the efficiency of these firms. Progressiveness, employment opportunities, and income distribution resulting from their activities is probably not much different from the trading firms. Employment opportunities offered by these firms are not significantly higher, both relatively and in absolute terms, mainly because of the high mechanization in the manufacturing process.

A conservative estimate for the cumulative losses of both factories up to 1967 by private sources, is about L.L. 7 million. The output of both factories for the same period is estimated to be 270,000 tons. The average differential between steel prices and billet prices could be taken as L.L. 100/per ton.⁸ The value added by the factories during the period is estimated at $270,000 \times 100 =$ L.L. 27 million. If the cumulative losses are added to the figure just calculated the total cost of production and other expenses for the firm would be found. Therefore, their costs per ton would be about L.L. 126.

⁸ Billets could be purchased at \$ 60 - 65 per ton, C.I.F. Lebanon, i.e., an average of L.L. 200/ton. The basic sales price of the factories for the same period could be taken as L.L. 300.

TABLE 22

BILLET AND ROUND BAR PRICES

1966 & 1967

(Dollars/ton)

	1966		1967	
	Billets	Round bars	Billets	Round bars
January	61.5	74.5	62	73.5
February	63	77.5	62.5	75.5
March	63.5	77.5	63.5	76
April	63	77	-	77.5
May	63	75.5	62.5	77.5
June	-	74.5	62	76.5
July	-	73	62	76
August	64	73.5	61.5	76
September	-	73.5	61.5	75
October	-	72	61.5	74
November	-	71.5	60.5	73.5
December	62	72	60	73.5

Source: Metal Bulletin's appraisal of Continental (European Carbon and Steel Community) Mills' export prices for ordinary commercial quality round bars around the middle of the month.

From Table 22 it can be seen that the highest price differential in Europe between billets and round bars is \$15. This price differential could be taken to represent the value added in rolling billets into a ton of steel. With an exchange rate of L.L. 3.20 to a dollar, this would amount to L.L. 48. On the average, therefore, a ton of locally processed steel has cost Lebanon 2.62 times as much as in Europe.⁹

It may be argued that most of the newly established industrial firms in developing countries are expected to incur losses during their years of initial development. It is the author's belief that five years should be sufficient for an infant industry of this type to mature because the manufacturing process involved does not require highly specialized skills. Thus their performance in 1967 will be analyzed.

⁹Some estimate the accumulated losses of the companies at L.L. 14 million. Therefore, the total production costs would be 41 million for 270,000 tons, that is L.L. 152/ton. If the average differential, \$ 13 = L.L. 40.3 between billet and round bar prices are taken to represent the value added in Europe, the ratio of costs in Lebanon to value added in Europe would be 3.78.

It is generally accepted that if the current tariffs on steel (L.L. 50/ton minimum), are reduced by L.L. 10/ton, imports would be competitive. As a result, the local manufacturing firms are not able to take full advantage of the protection offered by the government. The effective protection received would be below L.L. 40, but, obviously, not too far below that limit. Had the factories in Lebanon been as efficient as European rolling mills, and assuming an effective protection of L.L. 35/ton, they would have made at least L.L. 35/ton more profits. According to private estimates, in 1967 one of the factories lost L.L. 1.6 million. The other showed profits of about half a million Lebanese pounds. During the same period, production and sales of the companies totalled 80,000 tons. Instead of making extra profits of $80,000 \times 35 = \text{L.L. } 2.8$ million their accumulated losses amounted to L.L. 1.1 million. At best, therefore, we can say that European manufacturing costs are L.L. 35/ton less.¹⁰

¹⁰In this argument, prices for round bars and billets are implicitly assumed to be fair. If price discrimination is practiced the assumption is that it applies equally to billet as well as round bar prices. There is evidence to prove that in our analysis price discrimination is taken care of. A preliminary study conducted by Messrs. Erwin Holm in 1963 for a rolling mill shows that the costs of rolling one ton of round bars of 12 mms. is L.L. 37. Our original assumption for the value added i.e., \$15, is more than enough and compensates for any price discrimination.

It is the high tariff protection that is keeping the two factories in business. An L.L. 50/ton is higher than the value added. The ultimate user, therefore, is paying for the inefficiency of the factories. The government, on the other hand, is losing the opportunity of making approximately L.L. 2-3 million per year from import duties.

The growth and success of a heavy industry, as that of steel, depends strongly on proper management and good production principles. It seems that the greatest problem of these firms is their low inventory turnover figure, their heavy reliance on protective custom duties, and short-term loans. The companies have not been giving much heed to proper financial and industrial policies, which will definitely lead such an industry to unnecessary trouble and risks in the future.

CHAPTER IV

THE FEASIBILITY OF AN INTEGRATED STEEL INDUSTRY IN LEBANON

The main factor that should be taken into consideration in assessing the feasibility of a certain project is the market. Is the current market size big enough? Would it be in the future? To answer these questions factors determining the demand level should be analyzed.

Determinants of Demand for Steel in Lebanon

Generally speaking, steel in Lebanon is demanded for building construction, industry and governmental projects. The importance of these determinants varies. The significance of the latter were tested by correlating them with the total "iron and steel consumption"

(see Chapter 3, Table 13). "Consumption" figures as given by the United Nations Statistical Yearbook¹ are calculated by adding the total production to import figures and subtracting exports. In such an estimate, inventory figures are assumed to have remained constant. As seen in the previous chapter, for normal price fluctuations steel imports are price inelastic. Even beyond this range, overstocking (due to a price change) would not exceed more than 10-20% of the total inventory level. Therefore, inventory fluctuations may be discarded.

To find whether a certain year's import + production - export figure represented that same year's consumption several tests were administered, one of which will be discussed in the following section.

Steel Consumption vs. Building Construction

Several variables may be taken to represent the building construction activity in Lebanon. The most important two are the following: number of building permits

¹It may be argued that this is not the best source to get the demand level for steel in Lebanon. A more direct source, such as import-export trade statistics, production statistics obtained locally, could have been better. It is the opinion of the author that United Nations statistics may be more reliable, because they at least use consistent definitions.

issued during a year, and cement consumption. The latter is a better indicator of building construction activity. The date of issuance of a permit and the execution of it may not be the same. In view of the fact that most of the cement consumption in Lebanon is from local cement production (see Table 23), the factories will decrease their rate of activity rather than stock. Hence variations in inventory levels of cement are assumed to be negligible.

TABLE 23

LEBANON: CEMENT CONSUMPTION
(IN THOUSAND TONS)

Year	Consumption
1950	296
1951	252
1952	264
1953	292
1954	300
1955	407
1956	525
1957	584
1958	504
1959	682
1960	761
1961	866
1962	871
1963	806
1964	914
1965	1054
1966	1100

Source: From an unpublished thesis to be submitted for the MBA degree by Aref Farra.

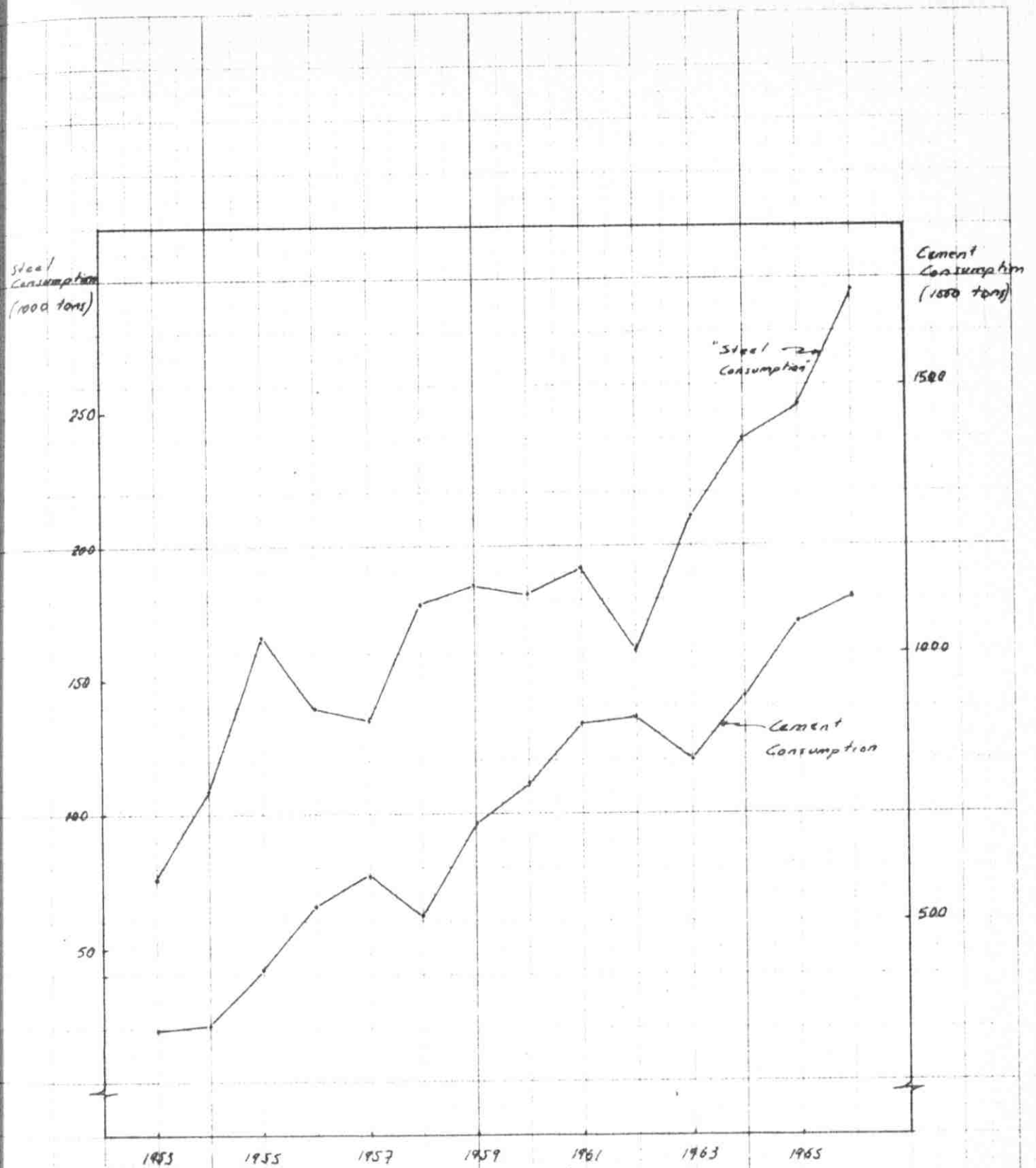


Fig 6: steel and cement Consumption in Lebanon.

As seen in figure 6, "steel consumption" leads cement consumption by approximately one year. In correlating steel to cement consumption, a higher degree of correlation is obtained if one year's steel consumption is compared with next year's cement consumption (see Table 24). This may be due to the fact that most of the Lebanese steel requirements are imported. In the future, steel consumption figures obtained by production + imports - exports may coincide with cement consumption, specially if the local factories improve their efficiency.

TABLE 24

STEEL Vs. CEMENT CONSUMPTION

	Steel Consumption Leading by One Year	Steel Consumption Simultaneous with Cement Consumption
R	0.951	0.883
R ²	0.904	0.780
B	0.190	0.194
σ_B	0.017	0.028

Source: Computed by the author.

This test proves that actual steel consumption lags behind steel imports + production - exports by one year. The high degree of correlation between steel consumption and cement consumption may be an indication that most of the steel in Lebanon is used for construction purposes. In forecasting the demand for steel however, cement figures by themselves could not be taken as a determinant. The demand for cement, as the demand for steel, is more or less, equally affected by such factors as capital inflow, growth of population and national income; since both are derived from demand for buildings.

Steel Consumption Vs. Capital Inflow

Could capital inflow² be taken as a determinant of demand for steel? To the extent that capital inflow figures affect building construction activity in Lebanon it should influence steel consumption. It is generally believed that capital inflows in Lebanon are invested

²The figures of capital inflows are computed by adding long term and short term net capital inflow figures with errors and omissions first, because errors and omissions were not estimated separately prior to 1960, and second, because the distinction between short term and long term capital inflow is not clear (see Table 4, Chapter I).

mainly in real estate and construction. If it is so, capital inflows should have some degree of correlation with cement consumption. The coefficients of correlation and determination are computed to be 0.589 and 0.347 respectively (see Figure 7). These figures may not be regarded to be very high, nor can they be taken to prove or disprove the belief that most of the capital inflow in Lebanon is invested in real estate.³

Steel Consumption vs. Price

As seen in Figures 10 and 11, the demand for steel in Lebanon is price inelastic. From Figure 11 one can detect that price and consumption have moved in the same direction. Two explanations may be given: either both variables are affected by a third variable, or else, as seems to be the case they are affected by different independent factors. It was shown before that prices in

³The capital inflow figures may not be regarded to be very reliable. When the author tried to correlate the capital inflow figures and the number of permits issued in Beirut with those of Lebanon, a higher degree of correlation ($R= 0.678$) was obtained between capital inflow figures and building permits issued in Beirut than between capital inflow figures and building permits issued in all of Lebanon ($R= 0.631$). This may mean that more of the capital inflow is invested in Beirut (see Figure 8).

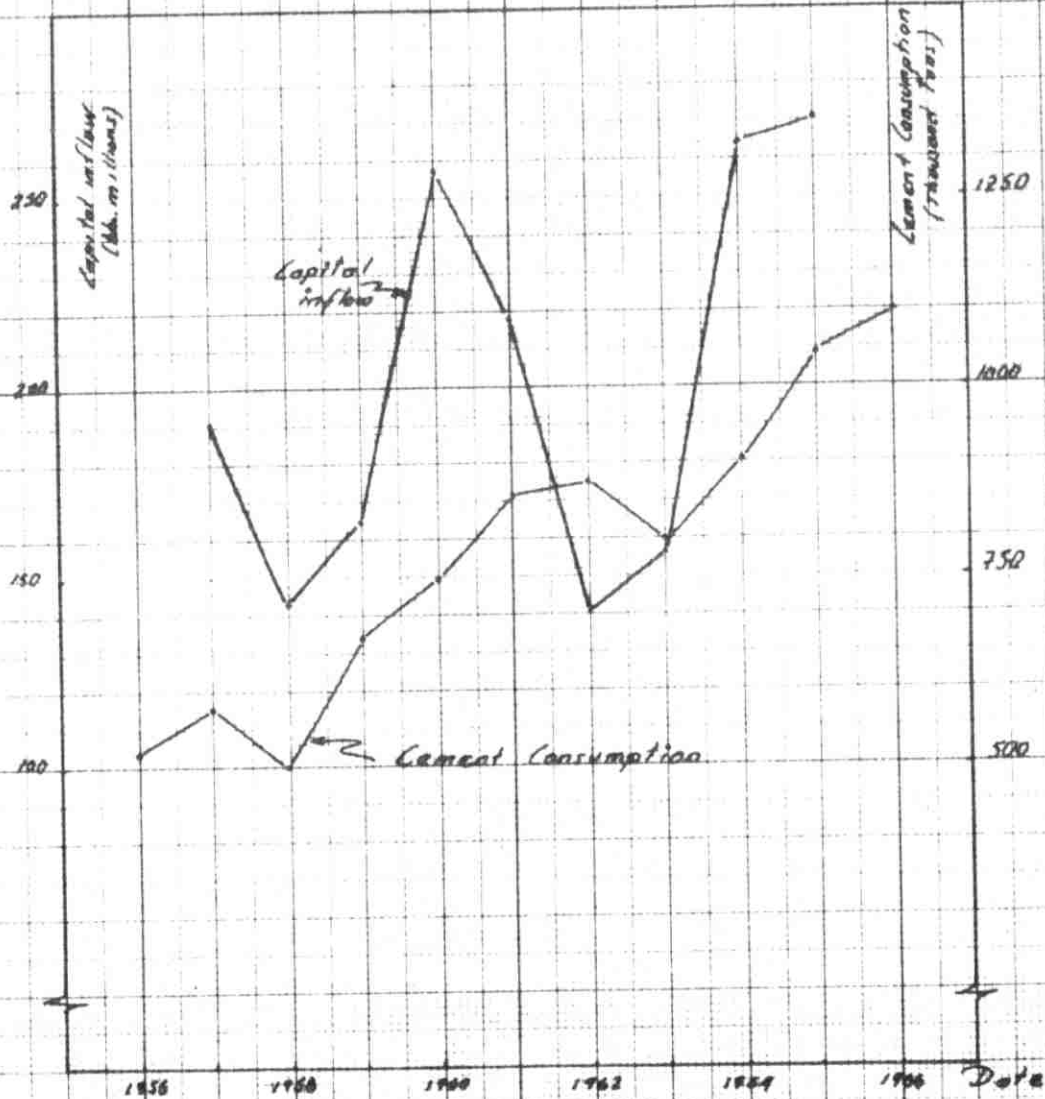


Fig 7. Capital inflow and cement consumption

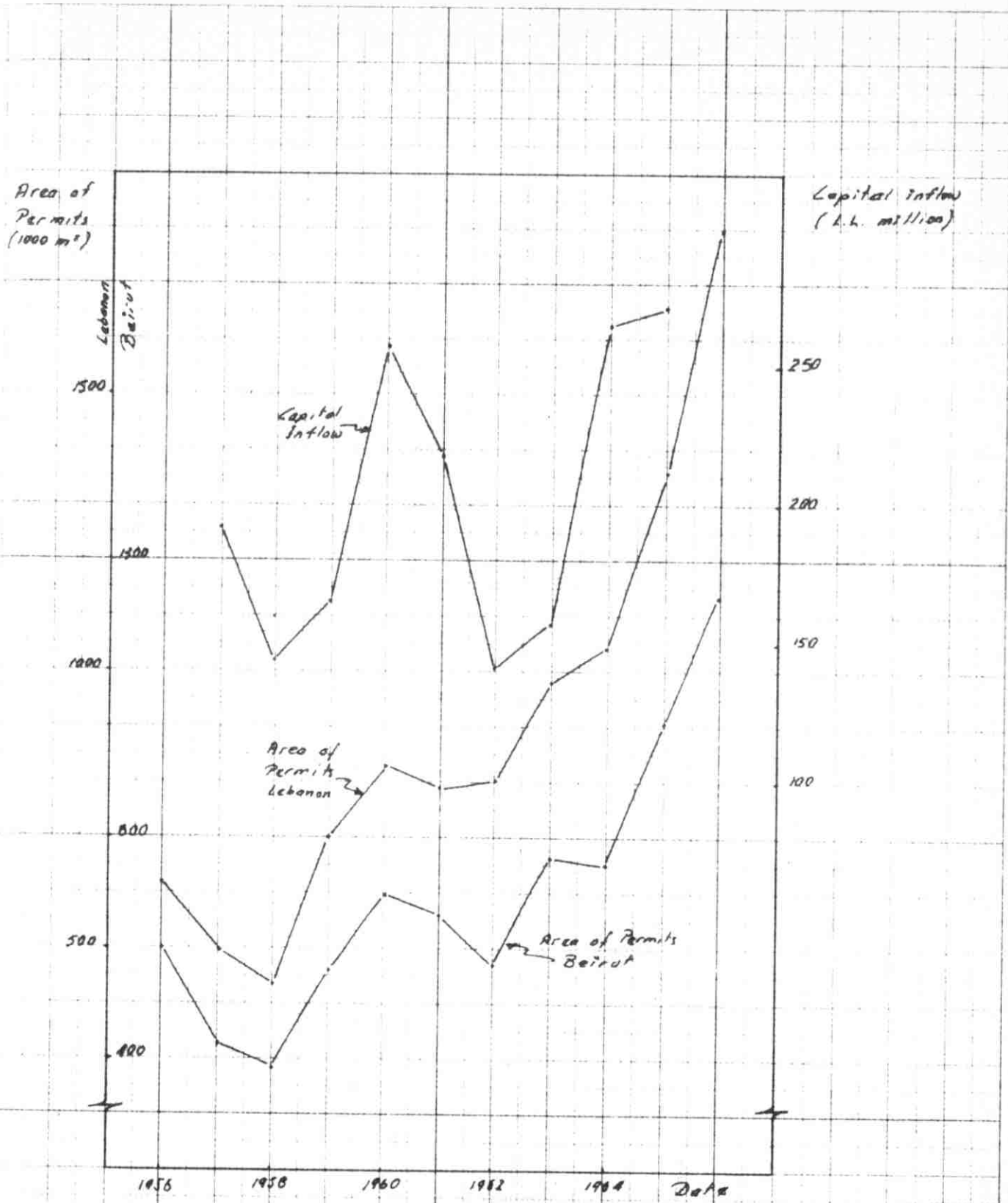


Fig 8: Capital inflow, area of building permits in Beirut and Lebanon

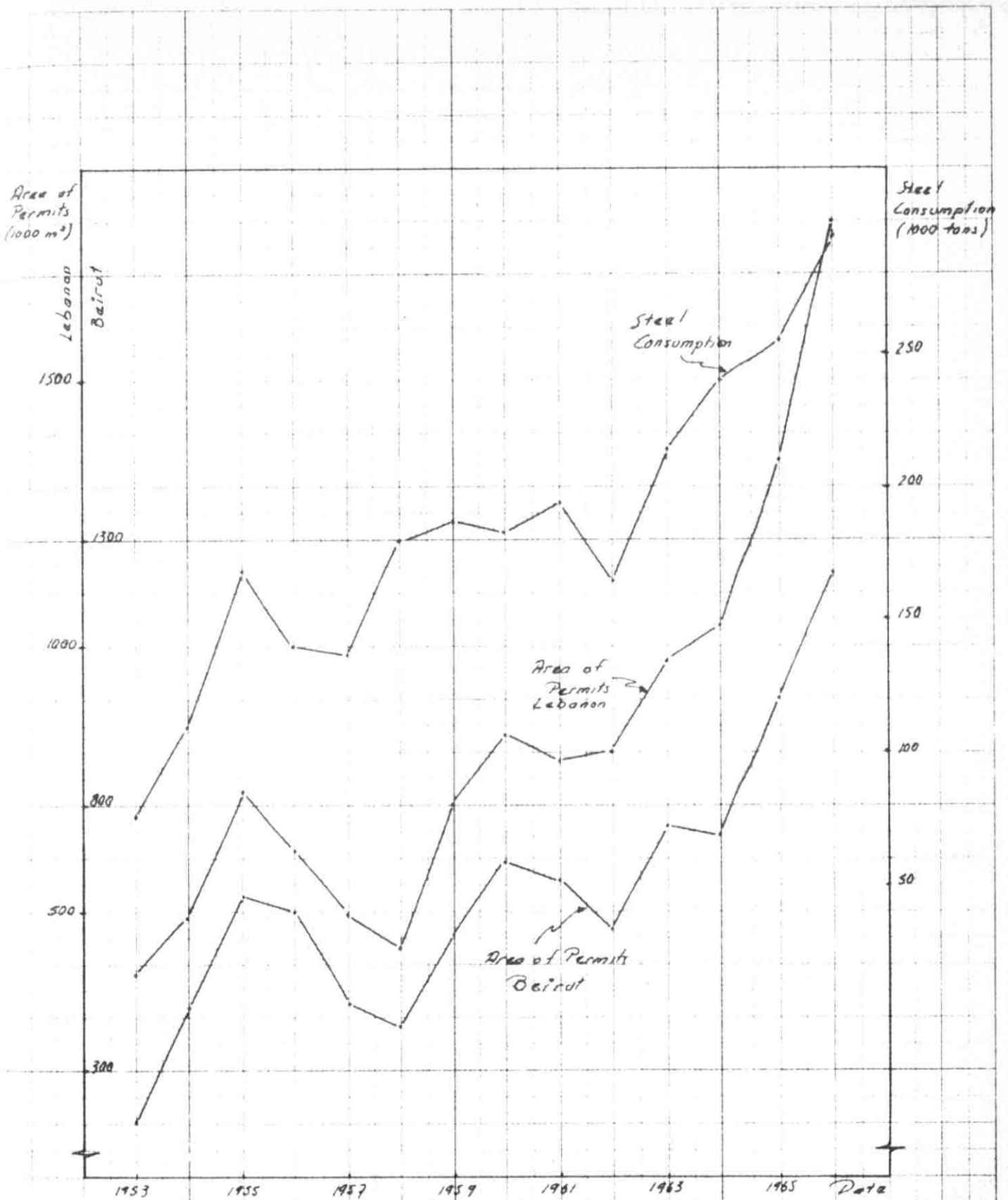


Fig 9: Steel consumption, area of building permits in Beirut and Lebanon.

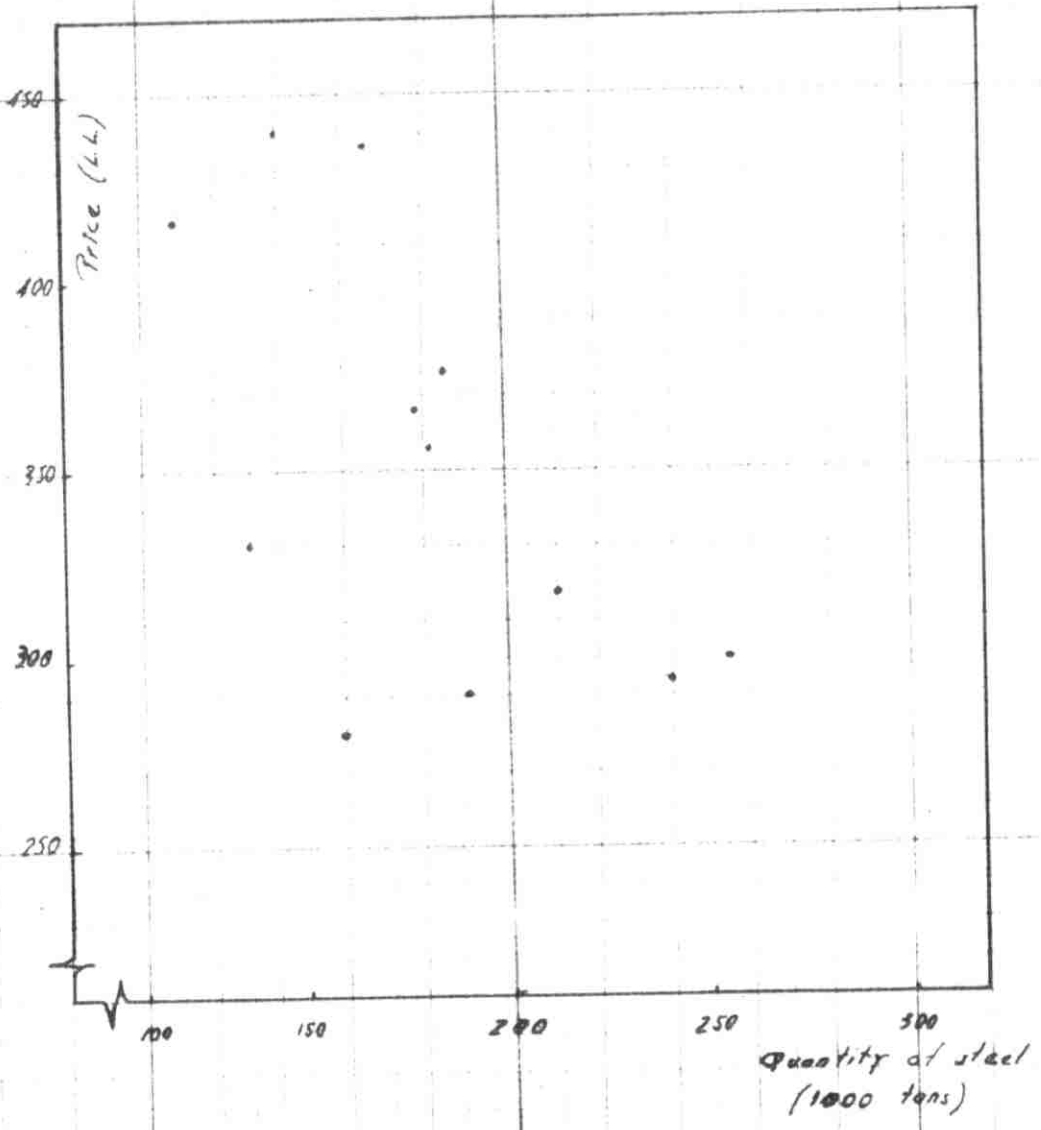


Fig 10: Price vs steel consumption in Lebanon

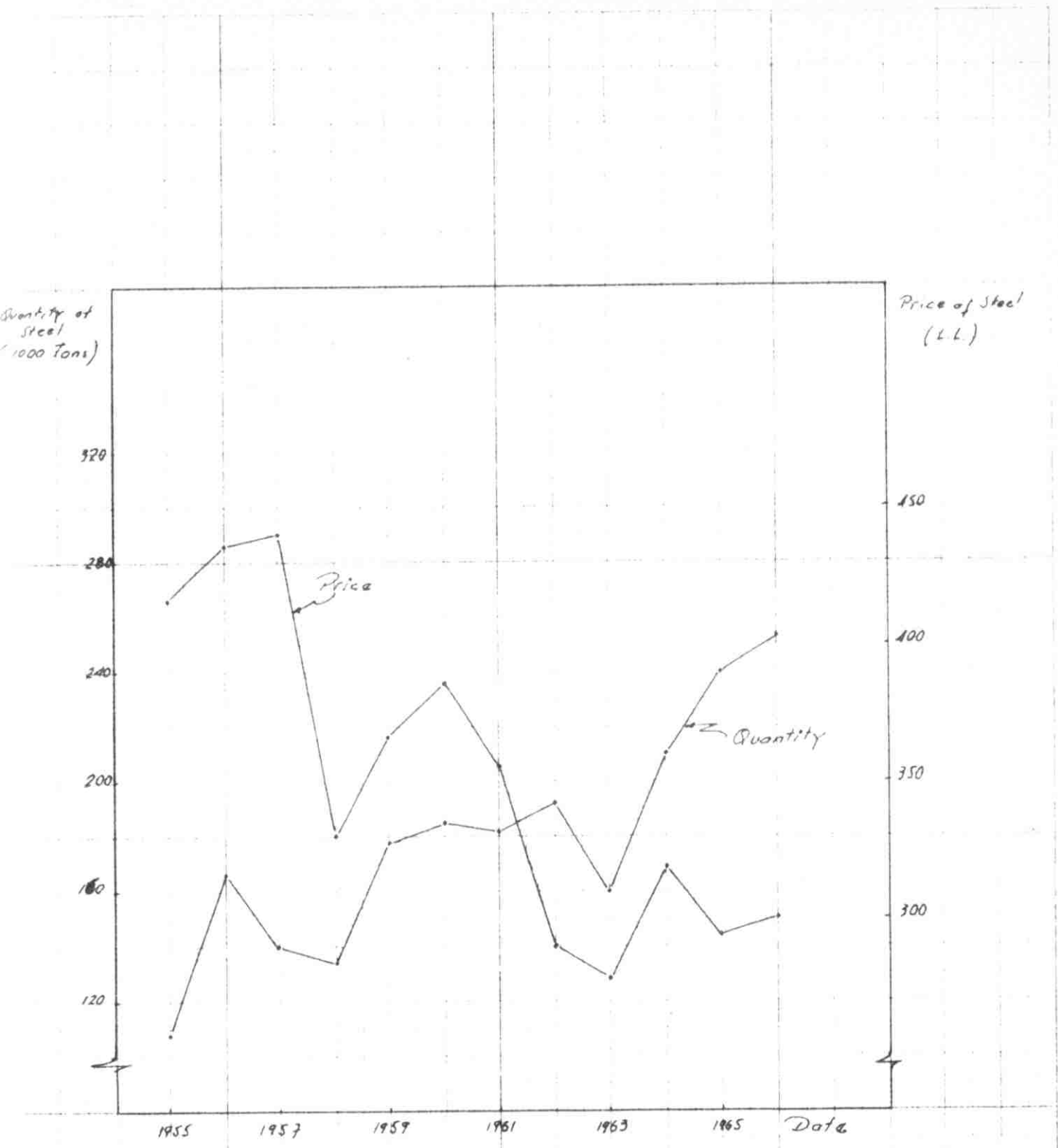


Fig 11: Price and quantity of steel

Lebanon have a high degree of correlation with European prices, while steel consumption in Lebanon is dictated by local Lebanese conditions.

Steel in Lebanon is mainly used for construction purposes. The cost of steel to the total cost of a building is usually below 10%.⁴ Price fluctuations in steel, even if relatively high, would not affect the total cost of the building to a great extent. Price, therefore, cannot be regarded as a determinant for steel demand.

Steel Consumption vs. Population

As population increases (see Table 25), the total consumption is expected to increase. The high degree of correlation between steel consumption and population (0.90), and the standard error of the estimate of the slope which is 13.5% of the slope, indicate that per capita steel consumption has remained more or less constant.

⁴This ratio is arrived at by interviewing several engineers who are practicing in Lebanon.

TABLE 25
POPULATION IN LEBANON
(IN THOUSANDS)

Year	Total Population
1954	1800
1955	1850
1956	1900
1957	1950
1958	2000
1959	2055
1960	2110
1961	2165
1962	2225
1963	2285
1964	2345
1965	2405
1966	2460

Source: United Nation's Demographic Yearbook, 1967.

Steel Consumption vs. Income Generated in Industry

Since steel in Lebanon is also used for industrial purposes, income generated in this sector, which could be considered to represent the level of industrial activity, was correlated with steel consumption. The degree of correlation ($R= 0.794$) is significant. The standard error

of the slope of the curve being 25% of the slope, the computed correlation loses some of its value.

TABLE 26

LEBANON: INCOME GENERATED IN INDUSTRY
(IN L.L. MILLION)

Year	Income
1957	259
1958	274
1959	260
1960	265
1961	282
1962	301
1963	316
1964	329
1965	366
1966	401

Source: Computed by the author from national income statistics.

Figures for the national income up to 1964 were obtained from the Economic Research Institute. In 1967, the Statistical Center of the Ministry of Planning published its own estimates for 1964. The figures obtained from the Economic Research Institute were then adjusted by the ratio of the Statistical Center's estimates to the Economic Research Institute's estimates for 1964. The adjusted values were multiplied by the ratio of the income generated in industry to national income.

Steel Consumption vs. Non-Economic Factors

Steel consumption depends on economic as well as technical and social factors. The steel consumption in building varies with such factors as height of the building, span of the building (see Figure 12), usage of concealed beams, and ribbed slabs. The factors just mentioned are influenced by variables like zoning regulations, degree of urbanization, family size, taste, etc. As building techniques improve the usage of steel varies. Up till recently, scaffolding used to be wooden in Lebanon. However, steel is replacing wood nowadays. Concrete blocks are being substituted for by steel. As the knowledge of local steel structure designers and builders improve, more and more steel will be used for construction purposes.

Most of these variables are not quantifiable. However, one is justified to assume that they are related to a large extent to the degree of urbanization. It is in urban centers that one finds buildings growing high and acquiring more sophisticated architectural forms.

The factors affecting building construction activity in Lebanon affect steel consumption. Quantifiable factors of the kind are: capital inflow, population and national

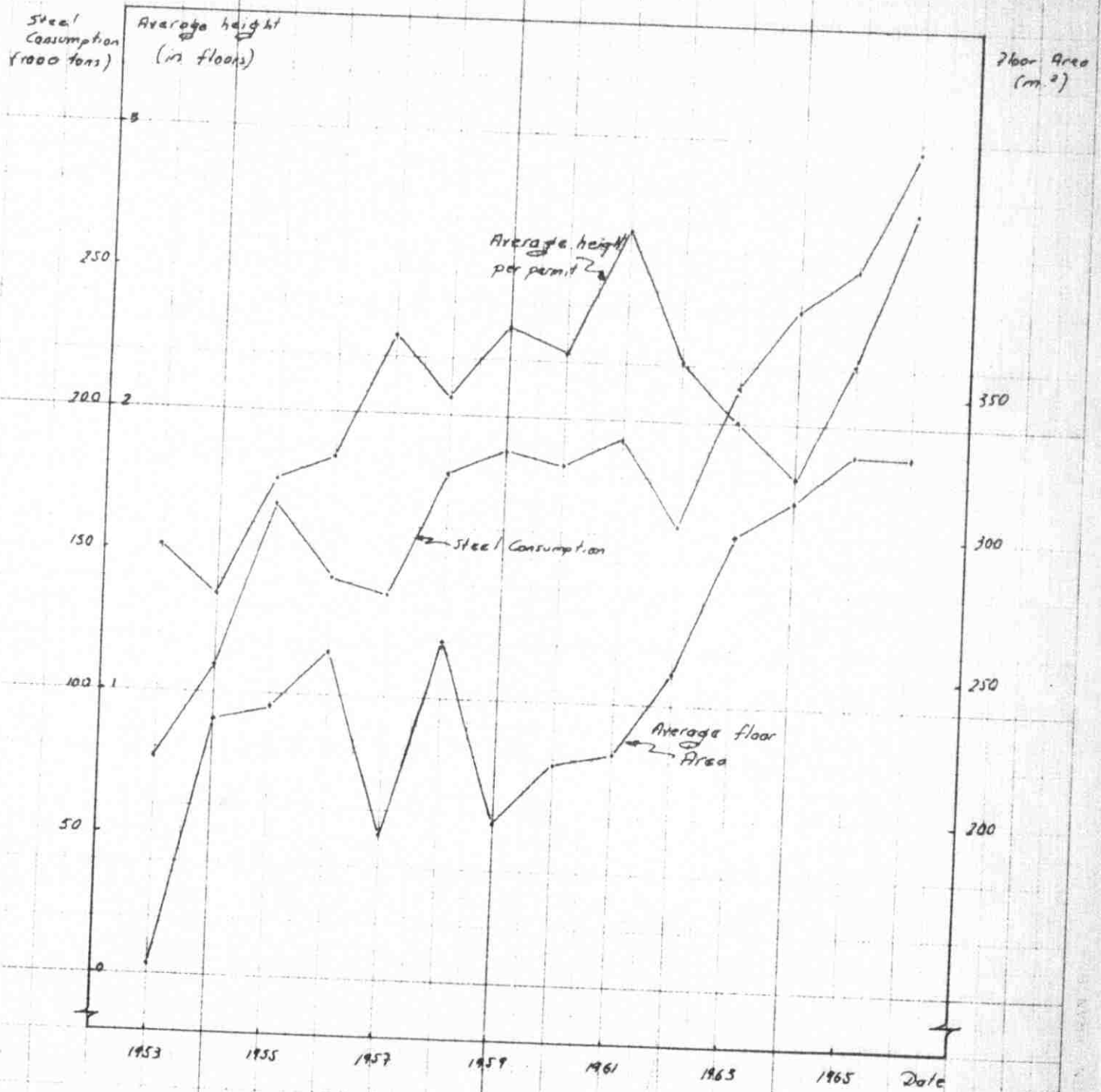


Fig 12: Total steel consumption, Average height per permit and average floor area in Beirut.

income. Since the ratio between national income and income generated in industry has remained relatively constant through the period concerned, national income figures are not included in forecasting the demand for steel. Therefore, the independent variables determining the demand level for steel are capital inflow, income generated in industry, and population figures. The coefficient of multiple correlation and determination between the independent variables and steel consumption is calculated to be 0.88 and 0.78 respectively. However, the standard errors of the coefficients to be used in the forecast formula is very high. For example, a negative relationship was found between income generated in industry and steel consumption. The author could not find any explanation for this phenomenon. In any case, this may be attributed to the fact that capital inflow, income generated in industry, and the population figures are not accurate.

In view of these facts, it is thought that a secular trend may be a better means to forecast the demand. The standard error of the slope of the curve is about 13% of the value of the slope. The standard error of the estimate itself is 23.4 thousand tons, which is less than 8% of the steel consumption figures of 1966.

The formula for forecasting the demand for steel is:

$$\text{Total Demand} = 90.87 + 11.38T$$

where "T" is the number of years after 1953.

Minimum Plant Size

Economies of scale play a very important role in the iron and steel industry. An output of a million ingot tons/year is a minimum below which an integrated steel plant can hardly be of efficient size. At capacity levels of 0.5 million tons/year costs are 18% higher; while if the plant produces 0.25 million tons only, the costs would be higher by 33%.⁵

The initial investment required for a plant capacity of 500,000 to one million tons a year is \$ U.S. 70 to 80 million. A plant consisting of a direct reduction unit,

⁵United Nations, Studies on Selected Development Problems in the Various Countries of the Middle East (New York: United Nations, 1967), p. 23.

an electric steel-making furnace, and a rolling mill, producing 40,000 tons a year would cost \$ U.S. 8 million, while the cost of a similar plant with 200,000 tons per year capacity would be about \$ U.S. 28 million.⁶ Therefore, the initial investment per ton of output per year would be about \$ U.S. 100 for 500,000 to one million tons capacity, \$ U.S. 140 for 200,000 tons, and \$ U.S. 200 for 40,000 tons.⁷ A fully integrated plant is justified only if it was intended to serve a population of some 40 million inhabitants with a steel production of at least 4 million tons per year. The investment in such a project would be \$ U.S. 500 to 600 million.⁸ The optimum capacity for integrated steel works in the European Coal and Steel Community is considered to be between two and three million metric tons or more per year.⁹

Bearing these factors in mind, it is obvious that the minimum plant size that should be opted is the one that

⁶United Nations, Science and Technology for Development (New York: United Nations, 1963), pp. 65-66.

⁷The average investment per ton of output was calculated by the author.

⁸United Nations, Science and Technology for Development, op. cit., p. 65.

⁹Metal Bulletin, Friday August 5, 1966, p. 13.

produces 1,000,000 ingot tons a year. According to the trend equation just derived, 75 more years are needed to arrive at that level of local demand. It goes without saying that the long range forecasts are very uncertain and mainly serve to point out the possible lines of development. But if Lebanon now decides to establish a steel industry of the size mentioned, it should find export markets. Otherwise, this investment would not be justified. Could Lebanon export? The immediate export market of Lebanese products would be the Middle Eastern market, and mainly the Arab countries of this region. Yet, two variables make such potential export improbable. 1) the total steel consumption of the Middle Eastern Arab countries is at present 1.5 million tons per annum.¹⁰ 2) the Middle Eastern countries are developing their own industries (see Tables 27-30) behind protective import duties. Potential exports to these countries are therefore reduced.

Could the excess output of Lebanon be sold to the international market? Here also the prospects are doubtful.

¹⁰United Nations, Studies on Selected Development Problems in the Various Countries of the Middle East, (New York: United Nations, 1967), p. 23.

"After home demand has been met steel producers still have enough capacity left to produce twice the amount of exports as there is demand."¹¹

TABLE 27

IRON MAKING PLANT PURCHASES BY MIDDLE EASTERN AND
NORTH AFRICAN COUNTRIES

<u>Country</u>	<u>Purchase Date</u>	<u>Capacity Tons/Year</u>
Algeria	1973/75	c* 650.000
Iran	1968/69	500.000
Iraq	1967/69	c 350.000
Morocco	1967/68	300.000
Saudi Arabia	1970/71	160.000
Turkey	1968/70	c 650.000
United Arab Republic	1967	350.000

Source: Middle East Steel (London: Industrial Export
Survey, 1967), p. 220.

* c stands for circa.

¹¹ Colin Jones, "Living with a World of Glut",
Financial Times, Monday June 17, 1968, p. 9.

TABLE 28

STEEL MAKING FURNACE PURCHASES BY SELECTED
MIDDLE EASTERN AND NORTH AFRICAN COUNTRIES

<u>Country</u>	<u>Purchase Date</u>	<u>Capacity Tons/Year</u>
Algeria	1973/75	c. 650.000
Iran	1968/69	500.000
Iraq	1967/69	350.000
Jordan	1967/68	c. 50.000
Morocco	1967/68	300.000
Saudi Arabia	1968/69	80.000
Tunisia	1969/70	c. 40.000
Turkey	1967	c. 515.000
United Arab Republic	1967/72	c. 590.000

Source: Same as previous table; p. 221.

TABLE 29

CONTINUOUS CASTING PLANT PURCHASES BY SELECTED
MIDDLE EASTERN AND NORTH AFRICAN COUNTRIES

<u>Country</u>	<u>Purchase Date</u>	<u>Capacity Tons/Year</u>
Saudi Arabia	1968/69	80.000
Syria	1969/70	120.000
Turkey	1967	50.000
United Arab Republic	1967/72	300.000

Source: Same as previous table.

TABLE 30
ROLLING MILL PURCHASES BY SELECTED MIDDLE
EASTERN AND NORTH AFRICAN COUNTRIES

<u>Country</u>	<u>Purchase Date</u>	<u>Capacity Tons/Year</u>
Algeria	1967	1,000,000
Cyprus	1967/69	c. 35,000
Iran	1967/70	300,000
Iraq	1967/69	c. 300,000
Jordan	1970	c. 30,000
Morocco	1967/68	250,000
Saudi Arabia	1968/69	30,000
Tunisia	1970/72	70,000
Turkey	1967/73	580,000
United Arab Republic	1967/75	482,500

Source: Same as previous table; p. 222.

All these factors lead us to conclude that the establishment of an integrated steel industry in Lebanon is economically unfeasible. There are many, however, who would not yield so easily. As a matter of fact, a preliminary feasibility study made by the Centre d'Etudes et de Promotion Industrielle for a steel plant by the direct reduction method called the Bouchet process is adaptable to Lebanon. The plant will produce 100,000 tons per year.

The author, however, would like to give his reservations regarding this study. There are several assumptions in the study which cannot be regarded as well-founded. Two examples could be cited: A ton of scrap is assumed to yield a ton of finished steel. In assessing the feasibility of such a project, billet prices are assumed to be \$ U.S. 70, which is a high figure.

It may be argued that the one million ton capacity which is taken as a minimum size is too high, since several countries have selected plant sizes which are far below that level. For example, the HyL direct reduction method (see Ch. I) which has proved to be successful, may be adopted by Iraq. The designed capacity of the plant is 300,000 tons a year, with a total cost of about \$ U.S. 140 million.¹² That is a fixed investment of \$ U.S. 460 per ton of output. This process uses natural gas as a source of energy. Therefore, the original high investment costs may be justified. But does Lebanon have such balancing advantages? In the following few pages this subject will be treated.

¹²Middle East Steel (London: Industrial Export Survey, 1963), p. 70.

Availability of Raw Materials, Finance
and Technical Skills

Raw Materials

It should be stated from the outset that very little is known about the availability of raw materials in Lebanon, because a sound geological survey has not been conducted. The absence of a sound geological survey renders it impossible to assess the availability of raw materials with any degree of certainty.

According to some, there are three types of iron ores in Lebanon. Hematites, the iron content of which is 20 to 30%, are well spread in areas such as Ehmej, Bcharre, Hadath el-Jebbe, and Laklouk. The reserves are estimated by the naked eyes to be about 20 million tons. Ores of better quality with an iron content of 35-40% are found near Dahr el-Baidar. The reserves are estimated again by naked eyes, to be between 12-15 million tons. Lastly, limonites, are the richest ores with an iron content between 50-60%. However, their location is not easily detected.

Marjaba, a village in Metn, used to have mines from which ores of this quality were mined.¹³

Coke is another important raw material for steel industry. It is the most important fuel. As far as it is known, coke is not available in Lebanon. Fuel oil is now being increasingly applied in steel production,¹⁴ but Lebanon is not a petroleum producer. As to other sources of energy, such as natural gas or electricity, Lebanon does not seem to possess any relative advantage. Yet, "The possession of adequate raw materials, though an advantage is not as crucial as it once was."¹⁵

Finance

Steel is a capital intensive industry.¹⁶ Loans of long term basis and bearing low interest rates would be

¹³From an unpublished report by Sami Sayegh on "Mineral and Metallurgical Industries in Lebanon", typescript, December, 1967. The ideas of Mr. Sayegh are not shared by others. According to H. Minassian, of the Engineering Laboratories, and M. Abi Zeid, of Consolidated Steel, Lebanon does not have sufficient quantities of ores to justify the establishment of an integrated steel industry.

¹⁴United Nations, Science and Technology for Development, (New York: United Nations, 1963), p. 66. ✓

¹⁵Ibid., p. 63.

¹⁶Jones, op. cit., p. 9.

needed to finance its construction and operation. As was shown in Chapter I, long term loans are practically unavailable in Lebanon.

The attractions of steel industry to private investors is little, since steel plants are not immediately profitable.¹⁷ One is, therefore, justified to conclude that the government should finance the project with the cooperation of international financial sources. The Lebanese government's attitude towards such a scheme seems to be negative up till now.

Technical Skills

In areas where there is no tradition in steel making, training takes time. Shortages of skilled labor are impediments for the growth of a steel industry.¹⁸ Lebanon does not have a tradition in steel making. The difficulties that the rolling mills have met and are meeting is a proof of this statement.

¹⁷United Nations, Science and Technology for Development (New York: United Nations, 1963), p. 64. ✓

¹⁸Ibid., p. 65.

Guided by this discussion one is justified to conclude that an integrated steel industry is not feasible in Lebanon. Yet, there are social, political, and other economic reasons for building an iron and steel industry.¹⁹ It is estimated that for every man employed in steel, eight or ten are employed in related or supporting jobs. "Its multiplier effect in providing employment in secondary and tertiary industries is said to be greater than that of almost any other industry."²⁰ Domestic production, even at low scale, can relieve the foreign exchange position. In Lebanon, however, most of the raw materials required in steel industry should be imported. Furthermore, the size of the project being relatively small, the employment opportunities would not be great. It is hard to believe that a steel industry in Lebanon will create a driving force for the establishment and development of other industries, because these other industries are also bound by the narrowness of the Lebanese market.

In case non economic factors are found to weigh more than the economic factors, and the government opts to establish an integrated steel mill, the capacity of the latter

¹⁹Ibid., p. 61.

²⁰Ibid., p. 62.

should not be more than 300,000 tons per year, 200,000 tons per year being more realistic.²¹

Conclusions and Suggestions

The major obstacles to enter the steel industry are capital requirements, absolute cost (i.e., cost of fixed capital), and scale of economy barriers.²² Yet in these days of bewildering speed of technological development, these hindrances may be altered. As far as the coming 5 - 10 years are concerned, a drastic change in production procedures is not expected and traditional methods are likely to maintain their supremacy.²³

In order to overcome the stated barriers, Lebanon should wait for a technological break through. However, this by itself will not solve the problem completely.

²¹It is not conceivable how all local consumption could be met by local production. It is beyond the means of any small scale firm to produce all the different types of steel consumed in the market.

²²Joe S. Bain, Barriers to New Competition (Cambridge: Harvard University Press, 1956), pp. 15 - 16.

²³"Blast Surface Supreme", Metal Bulletin, Friday November 25, 1966.

There are several economic, political, social, and geographical factors which make Lebanon unfit for heavy industrialization, of which the steel industry is a paramount example.

Lebanon is believed to be poor in mineral resources. Its potential customers are separated from their suppliers by Syria, which is known for its discriminatory policies. Moreover, there is no regular sea traffic between Lebanon and its potential customers in the Arab world:

Transport is of prime importance in the development of a steel industry and the costs of moving raw materials and distributing finished products may be extremely high. It is estimated that to make one ton of finished steel, about five and a half tons of raw materials and fuel have to be transported. The cheapest and most highly recommended form of transport is water, whether by sea, river or lake, but good road and rail communications are also essential for marketing purposes.²⁴

The political situation in the area has led investors in Lebanon not to commit large amounts of capital to any single project, nor to a single country in the

²⁴United Nations, Science and Technology for Development, op. cit., p. 64.

Middle East. Protective measures taken by other Arab countries in favor of their national industries, the belief that goods manufactured in Lebanon are of poorer quality as compared to those of Europe, plus the narrowness of the Lebanese market, make it even a more unattractive place to establish heavy industry. Should Lebanon, therefore, invest in an integrated steel industry? The private sector will not undertake such a project for reasons given earlier. As far as the public sector is concerned, the author believes that the 40 million dollars needed to establish a 200,000 tons per year capacity steel plant may be put to better advantage in some other field.

The attention in Lebanon should nowadays be geared towards improving the efficiency of the two existing steel mills. Yet, the establishment of a new rolling mill for merchant bars, other than round bars, should not be ignored. If the same degree of protection is given to this line as is given to round bars, the business may prove to be a profitable one. If intraregional trade is liberalized, and if the Arab countries co-ordinate their steel industries by attempting a division of labor, the chances of a successful steel industry in Lebanon may increase.

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