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THE SEA FREIGHT INDUSTRY IN LEBANON  
DEMAND ANALYSIS MARKET STRUCTURE SURVEY  
AND PROJECTIONS

BY  
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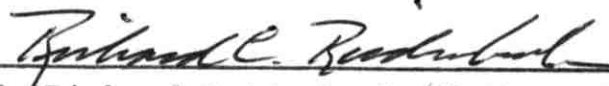
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THE SEA FREIGHT INDUSTRY IN LEBANON  
DEMAND ANALYSIS AND MARKET STRUCTURE  
SURVEY

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## PREFACE

The main purpose of this study is to analyze the demand for shipping space and to survey the Sea Freight market structure in Lebanon. To achieve this aim, an analysis of the cargo movements in the Ports of Lebanon, namely, Ports of Beirut, Tripoli and Zahrani, is required. The Port of Zahrani receives only tankers, analysis of which is believed to belong to a specialized field that is considered to lie beyond the scope of this study.

The writer has been satisfied with analyzing the cargo movements in the Port of Beirut only, mainly because the required data on the dry cargo movements in the Port of Tripoli are not available. Therefore, the analysis presented in this study will ultimately analyze the basic factors that tend to determine the volume of inward and outward cargoes through the Port of Beirut.

The Port of Beirut is considered to be one of the most important ports in the area in terms of its strategic situation

and its physical plant facilities. This importance has started growing after the Palestinian War of 1948 when the transit facilities that were offered by the Port of Haifa to the neighbouring countries shifted to the Port of Beirut. Added to this, is the fact that during the past two decades, Lebanon has grown to become an important financial center in the Middle East; this has tended to enhance economic development in the country and subsequently tended to add to the growing importance of the Port of Beirut. Consequently, many people have been induced to enter the Sea Freight Market and to operate shipping companies in order to profit from the growing demand for shipping space.

Two crucial questions may be asked at this stage: Will the growing importance of the Port of Beirut be maintained ? Does the future demand for sea-borne cargo promise any further inducements for more people to enter the Sea Freight Market ?

The demand analysis and the market structure survey presented in this study will attempt to answer these important questions.

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## CHAPTER I

### REVIEW OF LITERATURE

In this chapter it is intended to draw the economic significance of the water transport service in general, then to give a short survey of the world sea-borne trade and finally to briefly discuss some aspects of the theory of international trade that are believed to underly the movement of international sea-borne cargo.

#### A. Economic Significance of Water Transportation

Since its earliest existence, the function of water transportation, like any other means of transport, has been to move economic goods or factors of production from points where they are grown, made or processed (sources of supply) to points where they are wanted for consumption or use (places of demand).<sup>1</sup> To the economist who defines production

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<sup>1</sup>Eaton, R.J. The Elements of Transport, (London: Sir Isaac Pitman & Sons Ltd., 2nd edition, 1963), p.1

as the "creation of utilities", water transport is considered to be a phase of production and therefore tends to have its basic function (like any other means of transport) as the creation of utilities,<sup>2</sup> By moving goods from places where they have a low marginal utility to places where they have a relatively higher marginal utility, the water transport service is said to have created place utility.<sup>3</sup> In doing this function, a value is added to the transported goods and it is in this sense that water transport is considered to be a productive activity or a phase of production, in that it refers to conveyance in space. For example, by moving raw materials from a natural source where they happen to have a low marginal utility, to a convenient place of production where they have a relatively higher marginal utility, the water transport service is said to have created place utility. This place utility may not be reversible, i.e. if the raw materials were transported back to their place of natural source,

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<sup>2</sup>Zimmerman, Erich, Ocean Shipping (New York: Prentice-Hall Inc., 1923), p.4.

<sup>3</sup>Bonavia, M.R. The Economics of Transport (Cambridge University Press, 1963), p.2.



their value would tend to fall rather than to rise. Hence, the movement of goods does not in itself imply the creation of place utility unless they are moved to a place in which they can be more useful.

In many cases, the water transport service may be referred to as creating time utility.<sup>4</sup> This is the case when the speed of the sailing vessel is an important element in the movement of cargo. In such a situation, vessels with high speeds may command higher freight rates than vessels with lower speeds. For example, a forwarding agent may be interested in transporting certain perishable goods from one point in space to another within three days. The ships with higher speeds and frequently with higher freight rates, can make the journey in the required time. In this sense, the water transport service is said to create time utility.

In some rare cases, form utility may be created by water transportation. An example of this is when wine or

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<sup>4</sup>Marx, Daniel Jr. International Shipping Cartels (New Jersey: Princeton University Press, 1953), p. 9.

spirits are placed in a vessel for a long voyage because the vessel's motion will tend to expedite the aging process.<sup>5</sup>

The preceding discussion revealed the basic economic functions of the water transport service. Emanating from these functions is the view of many writers in the field that relates water transportation to standards of living and to the general welfare of civilization. The following quotation beautifully expresses this eclectic view about water transportation:

"The classical approach to shipping and indeed the only one justifiable in pure economics, is to regard it not as an independent form of endeavour, but as a service of an international character essential to the continuance of civilization and playing a big part in the betterment of living standards throughout the globe. This concept implies an adequate supply of suitable ships to cater for existing and developing transport needs and freight rates no higher than those requisite to provide a reasonable return on capital to their owners. A logical corollary is that the vessels should be operated by those capable of giving the cheapest service consistent with the high standards of safety at sea." <sup>7</sup>

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<sup>5</sup>Ibid.

<sup>7</sup>Cufley, C.F.H. Ocean Freights & Chartering (London: Staples Press, 1962), p.p. 315-6.

## B. Volume and Pattern of International Sea-borne Trade

The world demand for shipping space is very significant in international trade. Measured in weight, about seventy five per cent of international trade moves by sea; in terms of value, it is about sixty five per cent. The total volume of international sea-borne trade has been increasing over the past years. In 1965, it increased by about eight per cent while in 1966, it marked an increase of about seven per cent. These percentage changes can be seen in the perspective of a longer period in Table I. International air freight trade, on the other hand, seems to have been increasing at a faster rate during the past years. In 1963, the increase was about thirteen per cent while in 1964 it jumped to about nineteen per cent (Table II). These percentages measure the increase in the volume of international air-borne cargo as expressed in kilometer-tons. This may not allow for comparability with the rates of increase in the volume of international sea-borne trade which is expressed in metric tons; yet, it may be indicative, to a certain extent, of the growth rates in the volume of international air freight trade over the previous years.

TABLE I  
VOLUME OF INTERNATIONAL SEABORNE TRADE  
1958-1966

Year	Volume of Cargo (000,000 of metric tons)	Percentage Increase Over Previous Years
1958	940	-
1959	990	5.3
1960	1110	12.1
1961	1180	6.3
1962	1280	8.5
1963	1380	7.8
1964	1550	12.3
1965	1670	7.7
1966	1790	7.2

Source: United Nations, Monthly Bulletins of Statistics,  
January 1968.

TABLE II  
VOLUME OF INTERNATIONAL AIR FREIGHT TRADE  
1958-1964

Year	Volume of Cargo (000,000 of km-tons)	Percentage Increase Over Previous Years
1958	1670	-
1959	1930	15.6
1960	2170	12.4
1961	2480	14.3
1962	2920	17.7
1963	3290	12.7
1964	3920	19.2

Source: Institut de Transport Aeriennne (ITA) Studies, 1965

The figures in Table III indicate the volumes of cargoes loaded and unloaded in different parts of the world thus depicting the pattern of international sea-borne trade. It will be noticed that Africa, South America, Asia and the U.S.S.R. have their exports highly exceeding their imports - when measured in weight - especially during the sixties. This difference is mainly absorbed by the large excess of imports over exports to Europe, and partly to North America. Oceania has its sea-borne imports and exports almost identical. This lack of symmetry in the pattern of international sea-borne trade has an important bearing on the world demand for shipping space. It means that the observed difference between the outward utilization and the inward utilization of the total world supply of shipping space is large enough as to allow a considerable amount of world tonnage to sail in ballast or with low utilization factors. This, of course, has a fundamental effect on the unit costs of each of the sailing vessels. It should be pointed out however, that the pattern of international sea-borne trade, when measured in value, might not be as asymmetrical as when it is measured in weight.

TABLE III

PATTERN OF INTERNATIONAL SEABORNE TRADE

Millions of Tons

(L = Loaded; U = Unloaded)

Year	Africa		North America		South America		Asia		Europe		Oceania		USSR	
	L	U	L	U	L	U	L	U	L	U	L	U	L	U
1958	53	45	210	260	181	38	276	147	184	430	13	22	22	4
1959	57	51	210	288	196	38	298	148	187	440	16	22	30	5
1960	70	54	227	290	209	37	335	181	209	511	18	25	39	6
1961	83	56	239	288	209	37	365	215	213	533	22	28	51	7
1962	98	58	260	317	225	36	398	233	216	594	25	27	60	7
1963	125	61	286	326	229	35	427	258	224	654	24	30	67	9
1964	168	67	316	352	247	40	486	303	236	727	30	33	71	12
1965	195	73	321	378	263	42	527	341	256	791	30	36	79	13
1966	224	76	335	389	262	46	582	378	269	838	32	38	90	12

Note: Total cargo loaded is not equal to cargo unloaded. This discrepancy is due to rounding and minor statistical errors.

Source: United Nations, Monthly Bulletins of Statistics, January, 1968.

The major question of importance at this stage is the following: What determines this world demand for shipping space? The answer to this question is the level of international trade. The remaining part of this chapter will be dedicated to a brief discussion of some of the main factors that tend to influence the level of international trade and shape its pattern.

### C. Water Transport and the Theory of International Trade

Because of its extensive nature, discussion of the theory of international trade will be restricted in this section to the theory of comparative advantage and restrictions on imports.

#### 1. The Theory of Comparative Advantage:

What makes international trade feasible? What are the factors that tend to determine the type and volume of the goods to be exchanged in international markets? The answers to these questions have been forwarded by the theory of comparative advantage which was given its original theoretical shape by David Ricardo and which has been standing valid in front of many attacks despite the many changes that have been introduced to it.

Stated in its simplest form, the theory of comparative advantage claims that in a perfectly competitive world, where goods move freely between nations, each of these nations exports that commodity the production of which is relatively cheaper than other commodities when compared to the relative production costs of the commodities abroad, and imports that commodity in which other countries have a comparative cost advantage. Ricardo, having his starting point as the labor theory of value, attributed the difference in production costs of similar goods among nations to different production functions. According to this, Ricardo argued that the value of a commodity within a country is determined by its labor content; labor is immobile and lacks homogeneity.<sup>8</sup> Hence, a country producing a certain commodity demonstrates a production function different from another country producing the same commodity. Ricardo, therefore, claimed that in a two-country model,<sup>9</sup> if each country can produce a commodity with less labor than it can be produced by the other, each of these countries will have an advantage in the production of one commodity and a disadvantage in the production of the other.

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<sup>8</sup>Ellsworth, P.T. The International Economy (New York: The Macmillan Co., 3rd ed., 1964), p.p. 61-4.

<sup>9</sup>Ibid.



Hence, each country will be able to export the commodity in which it has an advantage and to import the commodity in which it has a disadvantage, and therefore, international trade may become profitable.

The Ricardian comparative cost approach centered its attention on the supply side of the only factor of production labor, and neglected the demand side. John Stuart Mill introduced demand into the picture when he developed a theory of international values that dealt with the question of ratios at which commodities would exchange for one another.<sup>10</sup> Mill argued that the actual ratio at which goods are traded depend upon the "reciprocal demand" between the two countries trading with each other. This means that this actual ratio depends on the strength and elasticity of each country's demand for the product of the other country. This ratio is said to be stable when the value of each country's exports are enough to pay for its imports. This theory of reciprocal demand was later extended by Edgeworth and then by Marshall.<sup>11</sup> The so-called "offer-curves" were introduced which represented the loci of possible points of trade equilibrium assuming that domestic adjustment

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<sup>10</sup>Ibid, p.p. 64-66

<sup>11</sup>Kindleberger, E.P. International Economics (Illinois: Richard Irwin, Inc., 3rd ed., 1963), p.p. 107-111.

has been made for each trading position given on the offer curve. This approach made it possible for a general equilibrium solution to occur in international trade where prices and quantities in production and consumption were accounted for.

In a more modernized approach, Haberler restated the theory of comparative cost in terms of another concept, namely, the production possibilities curve as applied to the opportunity cost concept. In his analysis,<sup>12</sup> Haberler dispensed with the assumption that labor is the only factor of production entering the production of a commodity. In its place, he substituted the concept of a nation's total economic resources, consisting of land, labor and capital of which subcategories could be distinguished. Furthermore, his model allowed the combination of these factors in varying proportions and under cases of increasing costs. In addition Haberler, substituted comparative cost by comparative opportunity cost, i.e. the alternative foregone if a certain commodity is produced or consumed. Hence, for example, if the opportunity cost of producing X commodity rather than Y commodity is lower in country A than in country B, while the

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<sup>12</sup>Ellsworth, p.p. 71-86

opposite is true in B, international trade is feasible and profitable. It will be noticed that in this approach, the essence of the comparative advantage theory still prevails but now it is comparative opportunity cost rather than comparative labor cost. Hence, country A may purchase X goods from country B not only because the latter produces the goods more efficiently and at relatively lower costs, but in many cases because though country A may be able to produce X goods more efficiently, yet, it might have an even greater advantage over country B in producing another commodity, say Y, and therefore will still tend to purchase X goods and shift its factors of production to the production of Y goods.

A crucial question at this stage is the following:  
What justifies the existence of differences in opportunity costs among nations ?

Perhaps the most widely accepted answer to this question results from the work of two Swedish economists, Eli Heckscher and Bertil Ohlin. The so-called Heckscher Ohlin Method<sup>13</sup> states that international trade is feasible because of the relative scarcity or abundance of the various factors of production in

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<sup>13</sup>Clement, M. Pfister, R., and Rothwell, K., Theoretical Issues in International Economics, (Boston: Houghton Mifflin Company, 1967), p.p. 86-96.

different countries. The Ricardian approach explained these relative differences in terms of different production functions the only content of which was labor. Heckscher and Ohlin located the roots of this comparative difference in the relative endowments of a country in terms of factors of production as related to another country. Hence, a country would tend to export the commodity which uses intensively that factor with which the country is relatively heavily endowed, and to import that commodity which uses the factor it is relatively in short of. Since different countries possess different relative factor endowments, their comparative advantage is extended to the different goods produced by these factor endowments. Therefore, as long as each commodity has its own distinctive production function, it becomes evident that international disparities in relative factor endowments are sufficient to explain the profitability of trade.

Many other modifications have been introduced to the theory of comparative advantage since the time of Ricardo, the inclusion of which is beyond the scope of this paper. Gerald M. Meier, for example, criticized the traditional explanation of international trade since Hume and Ricardo, through Marshall and Edgeworth to Haberler, as being an analysis of full static equilibrium concerned most directly with rich advanced countries, and modelled it to apply to

long-period dynamic analysis tending to accelerate economic development to poorer countries.<sup>14</sup>

Whatever the modifications may have been by writers in the field, it remains true that the "essence" of the original theory of comparative advantage still persists, namely, that the comparative differences in the production of goods among nations, irrespective of the cause or causes for these differences, underly the movement of international cargo, and, therefore, the world demand for shipping space.

## 2. Restrictions on Imports

There are certain impediments that tend to impose a certain degree of resistance on the movement of international cargo and subsequently, to hamper down the world demand for shipping space. Of these impediments are the measures that may be taken by countries to restrict their imports, usually through tariffs and sometimes through the use of quotas and other measures. These restrictions may either be imposed for the purpose of collecting revenues to the government, for remedying a balance of payments deficit, for protecting a local industry, for increasing money income at home, or for any combination thereof. Whatever the purpose behind imports

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<sup>14</sup>Meir, Gerald, International Trade and Development, (New York and Evanston: Harper and Row Publishers, 1963), p.p. 1-8

restrictions may be, their sheer imposition tends to have a significant effect on the world demand for shipping space. Many commodities that are produced by countries that have a comparative advantage over other countries' products, may lose this advantage when the countries possessing the comparative disadvantage take restrictive measures on their imports. Consequently, it follows that the more intense the restrictive measures on imports are, the lower the volume of international trade is expected to be and a lower demand for shipping space is anticipated. Not only so, but the whole directional pattern of international sea-borne trade is expected to be influenced due to a substitution effect in the direction of trade. Viewing the water transport service from this angle, it may be rightly concluded that most shipping companies are in favour of tearing down tariffs and other restrictions on trade because the results of such endeavors will definitely procure them with more work for shipping.

Restrictive measures may sometimes be imposed by countries on their exports, and such steps may generally be feasible when the domestic supply and the foreign demand for the commodities concerned are inelastic.<sup>15</sup> Such measures do not tend to influence demand for shipping space as both domestic supply

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<sup>15</sup>Kindleberger, p. 253

and foreign demand are inelastic and the purpose behind their imposition is usually the collection of more government revenues. However, and in a few cases, export restriction may be applied by a country in order to prevent the loss of certain goods that are needed for the use of the domestic consumer, or sometimes to keep down the price of a raw material used at home.<sup>16</sup> Such a step is an impediment that tends to have a bearing on the volume and pattern of international sea-borne trade.

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<sup>16</sup>Ibid., p. 255

## CHAPTER II

### DEMAND DETERMINANTS AND ANALYSIS

While chapter one discussed the theory of international trade that tends to determine the pattern and volume of international demand for shipping space, the purpose of this chapter is to try to determine the shape of the demand curve related to shipping space in Lebanon.

#### A. Methodology

##### 1. Nature of Demand for Shipping Space:

The demand for shipping space is derived from the demand for goods to be carried from one point in space to another. The water transport service is not demanded for its own sake but for the service it renders to move goods from places where they happen to have low marginal utilities to places where they have relatively higher marginal utilities. Just as labor and capital, for example, are not demanded for their own sake, but for their ability to transform raw materials into finished goods in order to satisfy the wants of the ultimate consumer, so is the water transport service demanded as a means for getting the goods



demanding carriage by sea to a certain location of economic activity in order to satisfy the wants of the ultimate consumer.

The elasticity of demand for shipping space, being a derived demand, is expected to be influenced by the elasticities of the demands for the different goods demanding transportation by sea.<sup>17</sup> Since the sea-borne commodities are different in type, and since each type tends to have a demand curve different from the other, the demand for shipping space tends to vary considerably from one commodity to another, and even for the same commodity it will tend to differ at different times as well as on different trade routes.<sup>18</sup> It is therefore obvious that the factors affecting the demand for the goods seeking carriage by sea, tend to simultaneously affect the demand for the water transport service. Hence, the availability of substitutes for the commodities seeking water transportation, would tend to influence the demand for shipping space in terms of cross-elasticities.

Considering the above general nature of demand for shipping space, it becomes obvious that any demand analysis

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<sup>17</sup>Marx, p.16

<sup>18</sup>Ibid., p. 17

with respect to sea freight transport, should analyse the demand for each type of commodity and on each trade route. Such an analysis seems well shaped in theory; in practice, however, it is very difficult if not impossible to accomplish. For the purpose of this study, the demand for shipping space in Lebanon is analysed as a sum total of all the commodities and this problem is partially done away with by classifying the projections in Chapter IV according to each type of commodity and by each trade route.

2. The General Nature of the Model:

The general determinants of demand for shipping space in Lebanon lie in the activity of the Lebanese Foreign Trade Sector. These determinants are broadly three, namely, imports, exports and transit trade, and these are the factors that tend to activate the whole traffic movement in the Ports of Lebanon. Therefore, the general model which depicts total demand for the water transport service in Lebanon may be written as follows:

$$\text{Demand for shipping space} = f (\text{Imports, Exports, Transit Trade}).$$

Not all Lebanese imports and exports are sea-borne because some of them are carried by land from and to neighbouring countries and some are shipped by air. Yet excluding total imports of oil that are transported through pipelines from Iraq and Saudi Arabia, we find that the total imports from and exports to the "sea countries" constitute the major part of total imports to and exports from Lebanon (See Appendix I ). The movement of these exports and imports could not have been done by air freight because air freight traffic in Beirut International Airport constitutes an insignificantly low percentage of the total cargo movement by sea (See Appendix II). In the light of this, it can be safely hypothesized that the factors determining imports to and exports from Lebanon are the same factors that to a large degree tend to determine demand for shipping space in Lebanon. The analysis in this chapter will therefore center around the factors that determine imports to, exports from, and transit trade through Lebanon. Because the required statistics on the Ports of Tripoli and Sidon are not available, the cargo movement through the Port of Beirut is considered to be representative of the demand for shipping space in Lebanon.

Regarding the factors of demand for shipping space related to imports, it is hypothesized that credit facilities, capital inflow, volume of tourism, prices of imports, population and income per capita, are the basic determinants of demand for imports through the Port of Beirut. Each of these factors will be analyzed through multiple correlation analysis in order to find their bearing on the demand for the water transport service and to derive projections therefrom.

As regards the determinants of demand for shipping space related to exports, they mainly refer to two general factors, namely, local production and the foreign demand for Lebanese products. As will be shown later, Lebanon on the one hand, is not classified as an industrial country and subsequently is not a major exporting country that may compete on the international level. Besides, more than fifty per cent of Lebanon's exports are to the neighbouring countries to whom the Lebanese products are mainly shipped by land. On the other hand, the determinants of foreign demand for Lebanese products are abroad and if they are to be analyzed the economic situation of each country importing Lebanese products should be studied; such a task is considered to lie beyond the scope of this research. For these main reasons, and especially

that exports through the Port of Beirut are minimal as compared to the total traffic movement of cargo in the Port of Beirut (See Appendix III), a secular trend will be used to determine exports through the Port of Beirut on the basis of which projections of same will be derived.

With respect to the determinants of demand for shipping space in Lebanon that are related to transit trade via the Port of Beirut, they have their components in the neighbouring countries that use the Port of Beirut mainly because they happen to lack their own ports on the Mediterranean Sea. A study of the demand for transit trade through the Port of Beirut will therefore require a careful study of the foreign trade sectors of each neighbouring country that uses this transit facility. For the purpose of this study, secular trends for cargo passing through the Port of Beirut for transit purposes will be determined on the basis of which total transit trade via the Port of Beirut will be projected.

3. Unit of Measurement Selected for Demand for Shipping Space:

Professor Richard Farmer<sup>19</sup> suggests that in a demand

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<sup>19</sup>Farmer, Richard, The Economics and Management of Transport Enterprise (Beirut: American University of Beirut, 1957), p.18

analysis for cargo transport, the unit of measurement to be used for demand is the "ton-mile". The intention has been that the same suggested unit of measurement be used for the purpose of this study. This has not been possible because the required data of imports and exports through the Port of Beirut classified each alone according to source and destination are not available. The distance is usually included in the unit of measurement for demand mainly because different trade routes tend to command different freight rates. Mr. George Hani, Manager of Heald & Co.,<sup>20</sup> believes that whatever the distance of the trade route may be, and though different trade routes tend to command different freight rates, demand for shipping space in Lebanon has been inelastic to freight rate changes. This is so because he believes that the freight rate constitutes a very low percentage as compared to the total acquisition cost of the commodity seeking transportation. The freight rate tariffs have not been changed for the past six years except after the closure of the Suez Canal in June 1967 when they were raised by 2½% because of increased running costs of the ships.<sup>21</sup> Mr. Hani believes that if there has been a drop

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<sup>20</sup> Interview with Mr. George Hani, Manager of Heald & Co. Ltd., Beirut, on 9/7/68

<sup>21</sup> Ibid.

in the demand for shipping space in Lebanon, it is definitely not due to the increase in the freight rates, but mainly due to the peculiar situation in the area after the June war, 1967.

Therefore, accepting that the demand for shipping space in Lebanon has not been elastic to different freight rates on different routes as well as to changes in freight rates on the same route, the use of the "ton" instead of the "ton-mile" as a unit of measurement for demand could be justified. However, there remains one problem to be considered, namely, the stowage factor or what is technically referred to in shipping terminology, as the "register coefficient" of the commodity seeking transportation. The relationship between the weight in ton and the measurement in cubic capacity of a commodity is referred to as the register coefficient of that commodity or its stowage factor.<sup>22</sup> This unit of measurement ranges between zero and one. A vessel might be loaded with iron and might be down to its "marks" while it may still have much room in its holds to include other commodities but it cannot because it is fully loaded as far as the capacity in weight is concerned. On the other hand, a vessel may be fully loaded

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<sup>22</sup>Svendsen, Arnljot, Sea Transport and Shipping Economics ( Bremen: Institut Fur Schifffahrtforschung, 1958), p.201

with wool and cannot take any more goods though it may not be down to its "marks" but because it is fully loaded in terms of its cubic capacity. Different types of cargo command different stowage factors, and while in this study the unit of measurement for demand is in "ton", this means that consideration has been taken of the weight of the commodity alone without giving due consideration to its volume measurement. It is difficult to reconcile between these two factors in one unit of measurement, especially that the latter depends highly on the way the commodity is packed. However, for the purpose of this study, it is assumed that the average stowage factor for the commodities seeking water transportation is close to one in the sense that the cargo whose volume measurement is relatively high as compared to its weight measurement tends to cancel out with the cargo whose volume measurement is relatively low as compared to its weight measurement. Hence, the use of the "ton" as the unit of measurement for demand will assume that each ton weight requires the same cubic capacity in the holds of the vessel.



B. Determinants of Demand  
Related to Imports

Lebanon is a country that imports virtually everything for its local consumption. It depends heavily on income from the tertiary sector, namely, that sector which includes general trading, banking, tourism, transport, communications and government enterprises. It does not rely much on income from industry nor from agriculture, mainly because it is largely in shortage of natural resources. The following table shows the contribution of the general sectors in the Lebanese Economy to the national income.

TABLE 4  
PERCENTAGE CONTRIBUTION OF ECONOMIC  
SECTORS TO NATIONAL INCOME IN LEBANON

<u>Sector</u>	<u>Per cent of National Income Produced</u>
Agriculture	15 - 20
Industry	15 - 20
Construction	4
Services	55 - 65

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Source: Christopher, John. Lebanon, Yesterday and Today (New York: Holt, Rinehart and Winston Inc., 1966), p.119.

Considering the above general structure of its economy, Lebanon tends to rely heavily on imports in order to satisfy the needs of its consumers. A look at the Lebanese balance of trade will show that sometimes the value of imports is seven times the value of exports, (See Appendix IV). The purpose of this section is to expose the factors that are believed to determine these imports.

1. Credit Facilities:

For two main reasons, credit is believed to be one of the major determinants of demand for imports in Lebanon. First, credit is the source of finance for imports. A merchant who wishes to import a certain commodity into Lebanon will often need credit to pay for the value of his imports and to clear his goods from the customs. Such cases are very common especially among the marginal merchants who are believed to be quite many in Lebanon on the individual level as well as, on the corporate level.

Second, extension of credit, tends to increase the supply of money in the economy and hence tends to subsequently increase the demand for consumer goods. These consumer goods being mostly not produced locally, are imported from abroad.

The way this factor has been quantified in this study is by taking the ending quarterly balances of the claims on the private sector by the banking system (Central Bank inclusive) and dividing by four to get the average outstanding credit for the year as shown in the Table on the following page.

## 2. Capital Inflow:

Capital inflow to Lebanon is of three kinds, namely, private long-term, private short-term, and government long-term capital inflow. Lebanon during the past two decades has been an attraction of foreign capital from the Arab countries in the area. The military coup d'états in the early fifties in Egypt, Iraq and Syria and the socialistic movements that characterized these countries during the early sixties, tended to encourage capital flight from these countries to a country like Lebanon which enjoyed a growing banking sector characterized by the Secrecy Law of commercial banks.

The significance of this factor as a determinant of demand for imports in Lebanon, is that the capital, especially the long-term capital, that comes to Lebanon, resides in it,

TABLE 5

CLAIMS OF THE BANKING SYSTEM IN LEBANON  
ON THE PRIVATE SECTOR

(Balances at end of quarter and average  
of outstanding credit for the year in  
Million L.L.)

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	Average outstanding claims for the year
1966	2491	2657	2790	2418	10356	2589
1965	2088	2154	2281	2393	8916	2229
1964	1845 <sup>a</sup>	1939	1992	2027	7803	1951
1963	1451	1506	1632	1733	6322	1580
1962	1133	1136	1128	1137	4534	1134
1961	1091	1097	1111	1108	4407	1102
1960	762	847	918	1002	3529	882
1959	529	556	596	650	2331	598
1958	542	565	549	528	2184	546
1957	434	478	512	516	1940	485
1956 <sup>b</sup>	-	-	-	427	427	427

a: Author's own estimate

b: Outstanding credit at end of 1st, 2nd and 3rd quarters are not available.

Source: For 1956 - 58, International Financial Statistics, Vol. 12, Dec., 1959

For 1959, International Financial Statistics, Volume 13, December 1960  
 For 1960-61, International Financial Statistics, Volume 15, December 1962  
 For 1962-63, International Financial Statistics, Volume 17, December 1964  
 For 1964-65, International Financial Statistics, Volume 19, December 1966  
 For 1966, International Financial Statistics, Volume 21, January 1968

and is employed in the country, will tend to enhance economic activity. Khalil Salem<sup>23</sup> says that the available statistical indicators witness to a continuous deficit in the current account of the Lebanese Balance of Payments since the early fifties. The available statistics show as well that this huge deficit has always been offset by surpluses in the capital account which allowed Lebanon to accumulate reserve currencies and gold to back its Lebanese Pound. However, Salem does not segregate between capital inflow to Lebanon and the Lebanese Balance of Trade but views them as two complementary links of the chain. He says that had not capital inflow to Lebanon been so large as to offset the accumulated huge deficit in the current account, Lebanon would not have been importing so much as to create such a huge deficit in its balance of trade. (For balance of payments see Appendix V ). This statement beautifully expresses the great significance attached to capital inflow as a determinant of demand for imports to Lebanon.

Table 6 shows the percentage distribution of the private long-term capital inflow that resided in Lebanon and this shows how this factor may enhance the development

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<sup>23</sup>Salem, Khalil, Lebanese Balance of Payments for 1961, A.U.B. The Economic Research Institute, 1964, p.p.23-4.

of the different sectors in the economy and subsequently demand for imports.

TABLE 6  
PERCENTAGE DISTRIBUTION OF THE NET PRIVATE  
CAPITAL INFLOW TO LEBANON ACCORDING TO  
ECONOMIC SECTORS FOR 1964 AND 1965

	<u>1964</u>	<u>1965</u>
Construction and Real Estate	51%	34%
Trade	16	39
Industry	12	12
Different Services	8	8
Others	13	7

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Source: George Medawar, Lebanese Balance of Payments for 1964-65, A.U.B., The Economic Research Institute, 1967, p. 46-7.

With respect to the private short-term capital inflow to Lebanon, it mainly refers to the deposits in the vaults of the banks held for the account of foreigners. Private short-term capital inflow to Lebanon marked a level of L.L. 209 millions in 1964 and L.L. 535 millions in 1965.<sup>24</sup> This sharp

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<sup>24</sup>Medawar, George, Lebanese Balance of Payments for 1964-65, A.U.B., The Economic Research Institute, 1967, p. 47.

increase is attributed mainly to the growing foreign confidence in the strength of the Lebanese Economy after it was exposed to the depression of the 1958 political crisis, as well as to the expanding activity of the banking sector that has been attracting this capital.<sup>25</sup> However, due to lack of available opportunities to channel this inflow into investment projects on the local level, the greatest part of this capital has been channelled through the banking system to investments abroad; only about 51% of the inflow in 1964 and 27% in 1965 remained in Lebanon.<sup>26</sup> It is therefore noticed that Lebanon has grown to play the role of an intermediary as far as the movement of private short-term capital is concerned. Yet, the significance of this type of capital inflow is that it gives more potentials to the banking system to extend credit on a short-term basis. Moreover, this inflow being a fresh injection into the economy will tend to have a multiplier effect, inflate the total supply of money and thereupon increase the demand for imports.

Regarding the government long-term capital inflow, it refers to the capital received on loan from governments or big official institutions abroad. As long as the government

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<sup>23</sup>Ibid, p. 15

<sup>24</sup>Ibid., p. 47

uses this capital to finance local public projects, this means that demand for imports is bound to increase.

As a measurement for this factor as a determinant of demand for imports, total net capital inflow to Lebanon has been taken for each year, Table 7. It is to be noted that these figures include the residual item "net errors and omissions" which are considered to represent capital inflow that is not included elsewhere under any other item in the balance of payments.<sup>27</sup>

### 3. Volume of Tourism:

Lebanon is a tourist country that tends to derive a substantial part of its income from tourism. As such, for two main reasons, demand for tourism is believed to be one of the major determinants of demand for imports. First, the more the tourists that visit Lebanon, the more the demand is for consumer goods and therefore the more Lebanon tends to import of these goods in order to satisfy this demand. Second, the tourists that come to Lebanon bring into the country foreign exchange thus increasing potential demand for imports.

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<sup>27</sup> Interview with Professor George Medawar, A.U.B. on 16/7/68.



TABLE 7  
TOTAL NET CAPITAL INFLOW TO LEBANON  
FOR THE PERIOD 1956-1966

<u>Year</u>	<u>Millions L.L.</u>
1956	170
1957	190
1958	144
1959	165
1960	258
1961	219
1962	140
1963	157
1964	266
1965	272
1966	272

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Source: For 1956, writer's own estimate

For 1957-60, Khalil Salem, "Unclassified Lebanon":  
Balance of Payments 1960, (Type-written).

For 1962-63, Khalil Salem, Lebanese Balance of Payments  
for 1962-63, Economic Research Institute,  
A.U.B. p.p. 12 and 13.

For 1964-65, George Medawar, Lebanese Balance of Payments  
for 1964-65, Economic Research Institute,  
A.U.B. p.p. 28-9

For 1967, Writer's own estimate.

The unit of measurement selected to quantify the volume of tourism in Lebanon is the number of tourists coming to Lebanon per year, Table 8.

TABLE 8  
NUMBER OF TOURISTS VISITING LEBANON

<u>Year</u>	<u>Number of Tourists</u>
1956	859154
1957	549593
1958	224045
1959	352884
1960	533083
1961	529361
1962	625827
1963	729883
1964	963441
1965	1220370
1966	1513443

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Source: National Council of Tourism for Lebanon.

#### 4. Prices of Imports:

It is known from economic theory that within a certain range, the higher the price of a certain commodity, the lower

is the demand for that commodity. This feature applies equally to the demand for locally produced goods and services as well as to the demand for goods imported from abroad. The higher the prices of imports, the lower their demand by local consumers and producers is expected to be. Klein and Goldberger<sup>28</sup>, in their import demand equation for the United States of America, suggest that relative prices between foreign and domestic products be included therein. For the purpose of this study, relative prices will not be taken account of for the following two main reasons:

1. Reliable figures representing prices of locally produced goods are not available to be compared internationally with foreign prices.

2. Considering the fact that Lebanon is not classified as an industrial country and produces very little for its local markets, the measure of relative prices becomes insignificant. If prices abroad rise relatively more than local prices, this will not mean, at least in the short-run, that Lebanese consumers will tend to buy local products, because in most cases substitutes for these products are not produced locally.

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<sup>28</sup>Klein, R.L., and Goldberger, S.A., An Econometric Model of the United States, 1929-1952 (Amsterdam: North-Holland Publishing Co., 1955), p.p. 19-20.

However, relative prices may be important for the purpose of this study only as far as they tend to affect redistribution of imports from the different foreign countries. If, for example, the general price level of imports rises, and if the rise in the general price level of the British goods is relatively less than the rise in the prices of the goods of the other exporting countries to Lebanon, the Lebanese importers may tend to buy more from Great Britain than from the other countries, though not necessarily a larger total volume of imports due to the income effect. This may therefore tend to change the trade route for the commodities imported. The measure of relative prices could have therefore been of a great importance had the "ton-mile" been of significance to be used as a measurement unit for demand for shipping space.

In this study, the general price level of imports will be considered without any reference to local prices. The way these prices have been determined is by taking the general price indexes of the "sea exporting countries" to Lebanon and weighting them by the percentage of imports from each respective country. (For these calculations see Appendix VI). Table 9 shows the price index of imports to Lebanon, 1958 being the base year.

TABLE 9

WEIGHTED PRICE INDEX FOR IMPORTS TO LEBANON  
(1958 = 100)

<u>Year</u>	<u>Index</u>
1956	95.62
1957	99.99
1958	100.00
1959	100.57
1960	103.94
1961	105.61
1962	103.87
1963	105.97
1964	106.94
1965	109.58
1966	112.41

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Source: Compiled from Appendix VI.

5. Population:

The greater the population of Lebanon, the greater the volume of imports to Lebanon are expected to be. The higher the population figure is, the more there are mouths to feed, the more is the demand for consumer goods, and the more imports are expected to be. On this basis, population is hypothesized to be one of the determinants of demand for imports to Lebanon. The

population figures used in this study are taken from the United Nations Demographic Yearbook for 1966 and they assume an almost constant rate of growth in population, Table 10.

TABLE 10  
POPULATION OF LEBANON  
(000,000)

<u>Year</u>	<u>Number of Population</u>
1956	1900
1957	1950
1958	2000
1959	2055
1960	2110
1961	2165
1962	2225
1963	2285
1964	2345
1965	2405
1966	2460

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Source: United Nations Demographic Yearbook, 1966.

6. Income per Capita:

National Income is the source from which all wages, salaries, profits and other types of income come. It is the purchasing power of the public that enables them to buy the goods and services that satisfy their needs. It is therefore considered to be a principal determinant of import demand for Lebanon. The finished products that are imported are sold directly to the consumers after passing through the transitory channels of middlemen. Similarly, the raw materials that are imported, are manufactured into finished products and sold to the consumers. Consequently, the role of national income as an import determinant is significant. Considering the fact that Lebanon imports most of its goods for its local consumption, these imports are expected to be highly income elastic.

The national income figures available for Lebanon have not been determined by any of the "output" or "incomes received" or "consumption plus investment" methods; they are rather partly the product of certain economic indicators like the activity of the foreign trade sector, the output of certain industries, the wages of workers, and partly the product of certain statistical manipulations.<sup>29</sup> The way the

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<sup>29</sup> Interview with Mr. Pierre Masa'ad of the Bureau of Statistics in Lebanon, on 24/7/68.

national income figures and henceforth the income per capita figures have been estimated is by considering the 1964 estimate of national income by the Bureau of Statistics in Lebanon as a base, taking the estimated growth for 1965 and 1966, deflating by the wholesale price index and going backwards by assuming the same rate of growth of the national income figures available till 1963 (see Table 11).

7. Proposed Model for Imports through the Port of Beirut:

The proposed model which will be used for analyzing the determinants of demand for shipping space that are related to imports is the multiple linear regression of the following form:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6$$

Where:

Y = Imports in tons through the Port of Beirut

$x_1$  = Claims of the Banking System on the private sector

(Credit extended to the private sector)

$x_2$  = Total net capital inflow to Lebanon

$x_3$  = Number of tourists coming to Lebanon

$x_4$  = Weighted import price index

$x_5$  = Population

$x_6$  = Income per capita in Lebanese Pounds.



TABLE II

COMPUTATION OF INCOME PER CAPITA FOR LEBANON

Year	( a ) National Income (000,000) L.L.	( b ) % of 1964	( c ) Wholesale Price Index (1958=100)	( d ) National Income (000,000) L.L.	( e ) N.I. Deflated by Price Index $\frac{(c) \times (d)}{100}$
1956	1417	69.529	-	-	-
1957	1503	73.749	-	-	-
1958	1325	65.015	-	-	-
1959	1570	77.036	-	-	-
1960	1671	81.992	-	-	-
1961	1789	87.782	-	-	-
1962	1877	92.100	-	-	-
1963	1951	95.731	-	-	-
1964	2038	100.000	100	2861.4	2861.4
1965	-	-	103	3154.2	3062.3
1966	-	-	106	3383.1	3213.7

TABLE II --(Continued)

Year	( f ) Derived N.I. 1964 = Base ( b ) x 2861.4	( g ) Population (000,000)	( h ) Income/Capita L.L.
1956	1989.5	1900	1047.1
1957	2110.2	1950	1082.1
1958	1860.3	2000	950.2
1959	2204.3	2055	1072.6
1960	2346.1	2110	1111.9
1961	2511.8	2165	1160.2
1962	2635.4	2225	1184.4
1963	2739.2	2285	1198.8
1964	2861.4	2345	1220.2
1965	3062.3	2405	1273.3
1966	3213.7	2460	1306.4

- Source: (a) For 1956-58, International Financial Statistics, vol. 16, Dec. 1963  
 For 1959-60, Coppock, Joseph, Foreign Trade of the Middle East: Instability and Growth, 1946 - 62 (Economic Research Institutes, A.U.B., 1966); p. 130  
 For 1961-64, International Financial Statistics, vol. 21, Aug. 1968
- (c) International Financial Statistics, vol. 18, Dec. 1965
- (d) Interview with Mr. Pierre Mas'ad of the Bureau of Statistics affiliated to the Ministry of Planning in Lebanon, on 24/7/68
- (e) United Nations Demographic Yearbook, 1966

In this equation:

a is the Y-intercept or the elevation of the plane and  $b_1 \dots b_6$  are the multiple regression coefficients that determine the relative relationship between the independent variables and the dependent variable.

### C. Application of the Data Related to Imports to the Proposed Model

#### 1. Estimation of the Parameters:

Multiple regression analysis was applied to the data collected for eleven years (Appendix VII) relating the demand for shipping space to the determinants of imports. It is to be noted that this analysis explains the degree of association between the independent variables on the one hand, namely, extension of credit, capital inflow, volume of tourism, prices of imports, population and income per capita, and the dependent variable on the other, namely, imports through the Port of Beirut. This analysis does not assume any cause and effect relationship; it is in economic theory that causal relationship is assumed to exist among the hypothesized variables. The coefficients resulting from the multiple regression analysis (Appendix VII) are expressed in the model that follows:

$$Y = 1349086.35 + 106.99x_1 + 1793.58x_2 + .11x_3 - 8739.95x_4 - 265.51x_5 + 668.34x_6$$
$$r_{yx} = \begin{matrix} (.14) & (.81) & (.20) & (.21) & (.11) & (.41) \\ \beta_{1..6} = & (.42) & (.51) & (.22) & (-.22) & (-.26) & (.19) \\ Sb_{12.34...7} = & (222.34) & (390.76) & (.17) & (12444.30) & (735.63) & (443.78) \end{matrix}$$

where:

$r_{yx}$  = The partial correlation coefficients.

$\beta_{1..6}$  = The standard partial regression coefficients.

$Sb_{12.34...7}$  = Standard errors of estimate of the multiple regression coefficients.

For the above multiple regression equation:

The Standard Error of Estimate ( $S_{yx}$ ) = 38141.24 tons

Coefficient of Multiple Correlation (R) = 97.78%

Coefficient of Multiple Determination ( $R^2$ ) = 95.61%

## 2. Significance of $R^2$ :

The coefficient of multiple correlation  $R$ , which in the above analysis came out to be 97.78%, measures the combined importance of the six variables that are hypothesized to explain the dependent variable.

The interpretation of this coefficient of multiple correlation is most clear when it is given in terms of the coefficient of multiple determination  $R^2$ , which in this case came out to be 95.61%. This means that the six independent variables tend to explain the demand for imports through the Port of Beirut to the extent of 95.61%. The unexplained variation between the actual parameters and the estimated coefficients of partial regression amounts to 4.39% and it refers to other stochastic factors that were not incorporated in the proposed model. It should be pointed out, however, that the standard error of estimate may be underestimated due to the few number of observations in relation to the numbers of variables.

## 3. Significance of the Standard Error of Estimate:

In a multiple regression analysis, unless the coefficient of multiple correlation is one, there is bound to be some observations which do not fall on the derived regression line

but somewhere around it. The standard error of estimate measures the size of the variability of these observed points around the derived regression line, thus determining the closeness of the "regression fit". The main significance of this measure is that in predicting the dependent variable Y, from the six independent variables, it can be said that for any given values of the independent variables, the chances are about 68% that the observed cases will fall within a band which is the predicted value of the dependent variable plus or minus one standard error of estimate which is in this case 38141.24 tons i.e. with a 68% confidence level, and for certain given values of the independent variables, the value of the dependent variable can be predicted with a margin of error plus or minus one standard error of estimate. With a 95% confidence level, the margin of error is expected to be plus or minus 1.96 standard errors of estimate.

#### 4. Interpretation of the Partial Regression Coefficients:

a) Credit as an import determinant:- The positive sign of the partial regression coefficient of credit as a determinant of imports through the Port of Beirut, indicates that there is a direct relationship between the number of tons imported and

the amount of credit extended to the private sector. This form of relationship supports the hypothesis that the more the credit extended to the private sector, the more the imports are expected to be through the Port of Beirut and subsequently the more the demand for shipping space.

The  $b_1$  of 106.99 implies that an increase of one unit in the extension of credit which is in this case a million Lebanese Pounds, will tend to increase imports through the Port of Beirut by 106.99 tons.

The factors related to the volume of credit to be extended refer to the ability of the Banking system as well as to the willingness of the commercial banks to extend credit to the private sector. Sometimes, the commercial banks happen to be short of loanable funds and sometimes they may have the funds but tend for one reason or another to restrict extension of credit to the private sector as happened in the post-Intra crisis period.

Therefore, the shipping companies that are interested in the sea trade routes that commercially join foreign countries with Lebanon, are to scrutinize this factor as being a determinant

of the flow of goods from those countries into Lebanon.

b) Capital Inflow as an import determinant:- Again the positive sign of the partial regression coefficient of net capital inflow indicates that there is a direct relationship between the number of tons imported through the Port of Beirut and the amount of net capital that flows into the country. This relationship agrees as well with the hypothesis that the more the net capital inflow to the country, the more are imports to be through the Port of Beirut and therefore the more demand for shipping space is expected to be.

The  $b_2$  of 1793.58 implies that for every unit increase in the net capital inflow which is in this case a million Lebanese Pounds, imports through the Port of Beirut will tend to increase by 1793.58 tons. While a one million Lebanese Pounds increase in the extension of credit tends to increase imports through the Port of Beirut by 106.99 tons, the same increase in capital inflow will tend to increase imports through the Port of Beirut by about seventeen times as much. The shipping companies therefore, that, for one reason or another are interested in studying the flow of sea-borne goods to Lebanon from the different parts of the world, are to give due attention to this factor as a determinant of demand for shipping space.



c) Tourism as an important determinant:- The partial regression coefficient  $b_3 = + .11$  implies that there is a direct relationship between the demand for tourism in Lebanon and the demand for imports via the Port of Beirut; for every one additional tourist who comes to Lebanon, imports through the Port of Beirut tend to increase by .11 of a ton. This relationship supports the hypothesis that the more the number of tourists visiting Lebanon, the more is the foreign exchange coming to Lebanon, the more there are needs to be satisfied and therefore the more the imports through the Port of Beirut are expected to be. Hence, the magnitude of the demand for tourism has a bearing on the demand for shipping space in Lebanon.

d) Prices of imports as an import determinant:- The partial regression coefficient  $b_4 = -8739.95$  implies that an increase of one per cent in the index of import prices as related to 1958 prices, will tend to decrease total imports through the Port of Beirut by 8739.95 tons. The negative sign of this coefficient is in accordance with the hypothesized view that there is a negative relationship between prices of imports on the one hand and total imports via the Port of Beirut, on the other.

It is noticed that the trend of the general price level of imports during the eleven years under survey is a rising one, and yet, the general trend of total imports through the Port of Beirut has been increasing during the same period of time. The reason is that all the other independent variables that tend to have a direct relationship with the dependent variable, combined together, tended to offset the negative relationship of prices with imports. The rising nature of import prices has therefore hampered the increasing trend of total imports and had these prices been having a downward sloping trend, imports through the Port of Beirut would have been expected to increase more than their observed level, thus increasing total demand for shipping space in Lebanon.

e) Population as an import determinant:- The partial regression coefficient  $b_5 = - 265.51$ , if it is to be interpreted along the same lines of the preceding independent variables, it tends to imply a negative relationship between population and imports through the Port of Beirut where an addition of one thousand people to the population figure, will tend to decrease imports by 265.51 tons. According to economic theory, the higher the population figure in a

country, the more the demand for consumer goods is expected to be keeping all other factors constant. Since Lebanon tends to import virtually everything for local consumption, an increase in the population figure anticipates a subsequent increase in the level of imports. Hence, the results obtained seem to be puzzling at a first glance.

Ceteris Paribus, the larger the population in Lebanon, a higher level of imports is anticipated. This relationship seems to hold true when the population trend is individually compared with total imports via the Port of Beirut (See Appendix VII). But when the imports trend is to be compared with the six independent variables as a whole the population trend seems to be overridden by the remaining variables, because though when it is compared as segregated from the others it correlates with the dependent variable and has an increasing function, yet its rate of increase tends to lay much behind that of the other variables combined. This seems to be the main explanation for getting this odd result as far as this variable is concerned.

f) Income per capita as an import determinant:- The significance of the partial regression coefficient  $b_6 = 668.34$  is that an increase of one Lebanese Pound in the income per

capita tends to increase imports through the Port of Beirut by 668.34 tons.

In a country like Lebanon, where the propensity to import is expected to be relatively high, the higher the level of income per capita, the larger is the demand for imports and the higher the demand for shipping space is expected to be. The positive sign of the partial regression coefficient supports this view by indicating that there is a direct relationship between income per capita and imports through the Port of Beirut.

##### 5. Interpretation of the Standard Partial Regression Coefficients:

The partial regression coefficients  $b_1$  through  $b_6$  showed the average change in the dependent variable per unit change in each of the independent variables. Because the independent variables have been expressed in different units from each other, the regression coefficients could not possibly develop a direct comparison between each of them with the exception of  $b_1$  and  $b_2$  that happened to be expressed in similar units. To overcome this difficulty, the variables  $Y$  and  $x_1$  through  $x_6$  may be converted into units of standard deviations usually known as the standard partial regression coefficient or the

Beta Coefficients. The  $\beta$  coefficients are derived by multiplying the partial regression coefficient of the independent variable by the standard deviation of the variable divided by the standard deviation of the dependent variable as follows:<sup>30</sup>

$$\beta_1 = \frac{106.995 \times 719.9139}{182046.3182} = .42$$

$$\beta_2 = \frac{1793.582 \times 51.3487}{182046.3182} = .51$$

$$\beta_3 = \frac{.112174 \times 362516.4241}{182046.3182} = .22$$

$$\beta_4 = \frac{-8739.948 \times 4.583}{182046.3182} = -.22$$

$$\beta_5 = \frac{-265.512 \times 179.182}{182046.3182} = -.26$$

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<sup>30</sup>Source of the data from Appendix VII

$$\beta_6 = \frac{668.345075 \times 103.9472}{182046.3182} = .19$$

In terms of Beta coefficients, the regression function would take the following form:

$$\frac{Y}{182046} = \frac{a}{182046.32} + \frac{x_1}{719.91} + \frac{x_2}{51.35} + \frac{x_3}{362516.42} + \frac{x_4}{4.58} + \frac{x_5}{179.18} + \frac{x_6}{103.95}$$

The interpretation of the Beta coefficients is as follows:

$\beta_1 = +.42$  means that a one standard deviation increase in credit tends to increase imports through the Port of Beirut by .42 standard deviations. Also,  $\beta_2 = +.51$  means that one standard deviation increase in net capital inflow to Lebanon will tend to increase imports through the Port of Beirut by .51 standard deviations. Similarly for the interpretation of the remaining Beta coefficients, they show the change in the dependent variable expressed in standard deviations per one standard deviation change in each of the independent variables. Once this relationship is established and all the variables are expressed in a standardized unit, they become in a position

where they can be compared with each other.

It will be noticed that if the independent variables are to be ranked in terms of their extent of influence on the dependent variable, capital inflow will rank first, then comes extension of credit, population, volume of tourism and prices of imports, and finally income per capita. It should be pointed out that population and prices of imports tend to negatively influence the dependent variable, while the others have a positive influence.

Consideration of the partial regression coefficients expressed in their standardized form, may have a revealing significance to shipping companies operating in Lebanon. A shipping company, before placing a ship on certain trade routes connected with Lebanon fully studies the volume of trade along these routes and its basic determinants.<sup>31</sup> In analyzing the goods that seek transportation by sea from foreign countries to Lebanon, the shipping companies may use the independent variables of the model as indicators of how voluminous the flow of goods may be along the trade routes to

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<sup>31</sup>Interview with Mr. Paul Zahlan, General Manager of the National Shipping Company, on 8/7/68.

Lebanon. The Beta coefficients will tell them which of the independent variables subjected to change will tend to influence more the dependent variable. These indicators may be of a better use when projections, if any, are classified according to source and type of commodities as will be shown in chapter IV.

6. Interpretation of the Partial Correlation Coefficients:

While the partial regression coefficients relate changes in the independent variables to changes in the dependent variable, and while the Beta coefficients allow for comparability between the independent variables, the partial correlation coefficients tend to show the degree of contribution of each independent variable, to the explanation of Y keeping all other variables constant.

The partial correlation coefficient of capital inflow  $r_2 = .81$  indicates that explanation of demand for imports through the Port of Beirut has been greatly improved by the inclusion of this variable which commands the highest partial correlation coefficient. When this variable was dropped and the remaining five variables were correlated with the dependent



variable, the multiple coefficient of determination dropped from 95.6% to 87.2%. (Appendix VII). This shows how important has been this variable to the improvement of the model in explaining the dependent variable. This further asserts the statement that had not capital inflow to Lebanon been so large, Lebanon would not have tended to import so much as to create such a huge deficit in its balance of trade.

Income per capita with an  $r_6 = .41$  comes next in importance as far as its contribution to the explanation of the dependent variable is concerned. As is apparent, its introduction to the model has enhanced its value as a tool for prediction and estimation.

The partial correlation coefficient  $r_4 = .21$  places the import prices variable in third place of importance as far as its improvement to the usefulness of the model is concerned. Volume of tourism with an  $r_3 = .20$  follows in importance Credit which ranked second as far as its influence in terms of change on the dependent variable, now ranks fifth as far as its enhancement to the value of the model is concerned. Population which relatively has a low  $r_5 = .11$  seems to contribute least

to the value of the model. That is why the puzzling result of its negative relationship with the dependent variable may be discarded as insignificant.

7. Interpretation of the Standard Errors of the b's:

"In any regression study where the results are based upon a sample of observations at random from a known universe, and where any importance is to be attached to the values found for the several regression coefficients, it is essential that the standard errors of each of those coefficients be determined and considered. ... a sample may have a high multiple correlation and yet yield regression coefficients for some variables which are almost entirely the result of chance fluctuations and therefore, are not statistically significant. This may occur even with large samples, ... computation, presentation and discussion of the standard errors of the regression coefficients are therefore vital parts for any such multiple correlation study." <sup>32</sup>

The above quotation elicits the great significance of the standard errors of estimate of the partial regression coefficients in any multiple correlation analysis. The standard errors of estimate have been computed for the b's (refer to page 45) and they look to be relatively large as compared with the net regression coefficients with the

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<sup>32</sup>Ezekiel & Fox, Methods of Correlation and Regression Analysis (New York: John Wiley & Sons, Inc., 1967), p. 287

exception of one variable, namely, capital inflow. Taking these figures at their face value, they tend to mean, (despite the high coefficient of multiple determination) that the influence of the independent variables with the exception of capital inflow, has not been accurately measured and the reliability of the net regression coefficients is statistically weak.

It should be pointed out at this stage that the small number of observations used in this analysis poses a "statistical" limitation on the study. Statistically, such a small sample may result in a perfect correlation if the number of variables equals the number of observations, which might lead to incorrect results. However, this is only a statistical manipulation. The relationships that have been established between the selected variables are highly backed and justified by economic theory as witnessed through the observations plotted graphically in Appendix VII .

While the standard error of estimate of a net regression coefficient is affected by the size of the sample (See formula in Appendix VIII), and while the sample in this analysis has been small, it was only natural to get large standard errors

of estimate for the net regression coefficients, except for capital inflow whose contribution to the value of the model has proved to be so high that it has tended to override this limitation though it has been hampered by it.

D. Determinants of Demand Related  
to Exports

1. Lebanese Production and Foreign Demand:

The volume of Lebanese production tends to partially determine the level of exports from Lebanon to foreign countries. As already mentioned, Lebanon is not an industrial country though it produces some industrial goods but not on an enough large scale to justify a significant volume of exports. The major industrial item in this respect (compared in tons) is cement. Table 12 shows the volume of production of cement for a six-year series from 1969 through 1965.

As far as the foreign demand for Lebanese industrial goods is concerned, cement also ranks as the most important item thereof, when compared in tons. Only a minor part of the total cement produced is exported to foreign countries.

TABLE 12  
CEMENT PRODUCTION  
1956-1965

<u>Year</u>	<u>Thousands of Tons</u>
1960	855
1961	874
1962	861
1963	897
1964	881
1965	970

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Source: Recueil de Statistiques Libanaises, 1965, Volume 2  
p.p. 210-11.

Table 13 shows the volume of cement exported for the same six-year period from 1960 through 1965.

TABLE 13  
EXPORT OF CEMENT  
1960-1965

<u>Year</u>	<u>Tons</u>
1960	124749
1961	27496
1962	11260
1963	117831
1964	61731
1965	39733

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Source: Recueil de Statistique Libanaises, 1965, Volume 2,  
p.p.308-9.

Other industrial goods following <sup>in</sup> importance that are exported from Lebanon, are "asbestos cement" iron and steel rods, raw hide, plywood, accessories for iron and steel pipes and aluminium sheets. Table 4 gives an idea of the volume of foreign demand for these industrial goods.

Table 15 shows the volume of production and the level of exports for the seven most important agricultural products that are produced locally and exported to the foreign markets. It should be noted that most of these exports are made to the neighbouring countries to which these products are shipped by land.

## 2. Proposed Mathematical Tool:

It is noticed from the previous section that Lebanon is not a major exporting country that may compete in international markets. Apples rank among one of the most significant products and yet Lebanon faces every year many problems in marketing the excess of its apple production. This being the case, it will be a tedious job to try and determine the factors that tend to underly foreign demand for Lebanese products, because these factors should be sought for in the foreign countries that import Lebanese products, as well as in competitive countries.

TABLE 14

VOLUME OF EXPORT FOR SOME INDUSTRIAL GOODS PRODUCED  
IN LEBANON

(Tons)

Year	Asbestos Cement	Iron & Steel Rods	Raw Hide	Plywood	Accessories for Pipes	Aluminium Sheets
1960	10531	190	1961	1235	1327	371
1961	10600	512	1864	1631	1234	462
1962	18109	1262	2286	2176	1925	1483
1963	14718	5050	2463	2445	2486	942
1964	15262	3466	3965	2216	3211	1201
1965	27558	7843	5592	3455	3155	2323

Source: Recueil de Statistiques Libanaises, 1965, Volume 2, p.p. 308-315.

TABLE 15

VOLUME OF PRODUCTION AND EXPORTS OF THE SEVEN MAJOR  
AGRICULTURAL PRODUCTS IN LEBANON

( Tons )

Year	Oranges		Apples		Lemon		Bananas	
	Prod.	Exp.	Prod.	Exp.	Prod.	Exp.	Prod.	Exp.
1960	100,000	63378	53,000	41690	40000	17736	26000	15322
1961	127,000	49851	85,000	45025	57000	18316	26000	16397
1962	133,000	68818	80,000	50813	55000	18392	25000	15557
1963	150,000	75340	75,000	43499	60000	28054	28000	12798
1964	145,000	70769	125,000	63927	65000	23493	22000	13868
1965	148,556	80341	115,080	79835	69000	34777	25340	9047



TABLE 15 -- (Continued)

Year	Olives		Wheat		Potatoes	
	Prod.	Exp. <sup>a</sup>	Prod.	Exp.	Prod.	Exp.
1960	30000	-	11000	1555	28000	25523
1961	65000	-	12000	1575	50000	18545
1962	16000	-	13000	2317	60000	23432
1963	60000	-	10000	1555	70000	30754
1964	30000	-	15000	4034	80000	2912
1965	49000	-	12600	6373	53640	26644

a- Data not available.

Source: Compiled from Recueil de Statistiques Libanaises, 1965, Volume 2.

Hence, because Lebanese production is relatively low, and because the determinants of demand for Lebanese products are not within the reach of this study, and considering the fact that waterborne exports constitute a relatively low percentage of the traffic movement in the Port of Beirut (See Appendix III), the best tool to be used for analyzing and projecting demand for shipping space for export purposes, is trend analysis. In finding the secular trend for exports through the Port of Beirut, the following computations are made:

Year = X	$Y_1 = \text{Seaborne Exports}$	$y = Y_1 - \bar{Y}_1$	$x = X - \bar{X}$	xy	$x^2$
1956 = 1	234627	27435	- 5	-137175	25
2	271845	24653	- 4	-258612	16
3	156069	-51123	- 3	153369	9
4	133687	-73505	- 2	147010	4
5	107041	-100151	- 1	100151	1
6	142610	-64582	0	0	0
7	236059	28867	1	28867	1
8	202064	-5128	2	- 10256	4
9	229434	22242	3	66726	9
10	294353	87161	4	348644	16
11	271325	64133	5	320665	25
$\sum X = 66$	$\sum Y_1 = 2279114$				
$\bar{X} = 6$	$\bar{Y}_1 = 207192$			$\sum xy = 759389$	$\sum x^2 = 110$

$$Y = \frac{(\sum xy)}{(\sum x^2)} \quad X = \frac{759389}{110} \quad X = 6903.54$$

$$Y_1 - 207192 = 6903.54 (X - 6)$$

$$Y_1 = 6903.54 X + 165770.76$$

The above derived secular trend conveys the meaning that, on the average, seaborne exports through the Port of Beirut increase by 6903.54 tons every year. This formulation signifies that the volume of seaborne exports are a function of time and inertia, thus eliminating the real factors that in essence may determine exports through the Port of Beirut.

#### E. Determinants of Demand Related to Transit Trade

The strategic situation of the Port of Beirut has been offering a transit service to the neighbouring countries that have a part of their overseas trade with Europe and the United States of America and that happen to lack a Port of their own on the Mediterranean Sea. An analysis of this factor as a general determinant of demand for shipping space in Lebanon, requires a separate study of the general economic situation of each of the neighbouring countries with a special attention to the forces that govern the foreign trade sector of each of these

countries that use the transit facility through the Port of Beirut. Such a study falls outside the scope of this paper and it is believed that secular trends depicting transit trade may be the best tool, given the time, information and purpose of the study. Following are the necessary computations for deriving the inward transit trend (sea-land), the outward transit trend (land-sea), the sea-sea trend and finally the secular trend for transshipments.

	X	$Y_2 = \text{sea-land}$	$x = X - \bar{X}$	$y = Y_2 - \bar{Y}_2$	xy	$x^2$
1958 =	1	153397	-4	-6788	27152	16
	2	153795	-3	-6390	19170	9
	3	163763	-2	3578	7156	4
	4	147682	-1	-12503	12503	1
	5	151496	0	-8689	0	0
	6	140360	1	-19825	-19825	1
	7	167647	2	7462	14924	4
	8	156108	3	-4077	-12231	9
	9	207421	4	47236	188944	16

$$\begin{aligned} \sum X &= 45 & \sum Y_2 &= 1441669 \\ \bar{X} &= 5 & \bar{Y}_2 &= 160185 \end{aligned}$$

$$\sum xy = 223481 \quad \sum x^2 = 60$$

$$Y_2 = \frac{(\sum xy)}{(\sum x^2)} \quad X = \frac{223481}{60} \quad x = 3724.68 \quad x$$

$$Y_2 - 160185 = 3724.68 (X-5)$$

$$Y_2 = 3724.68 x + 141561.60$$

The positive slope of the above function related to the "Sea-land" transport cargo means that from the observed past trend, inward transit cargo is expected to increase on the average by 3724.68 tons every year. Years 1956 and 1957 have been omitted because they constitute two extreme years (See Appendix IX).

$X_x$	$Y_3 = \text{land-sea}$	$x = X - \bar{X}$	$y = Y_3 - \bar{Y}_3$	$xy$	$x^2$
1958=1	121477	-4	-5120	20480	16
2	145909	-3	19312	-57936	9
3	130762	-2	4165	-8330	4
4	105956	-1	-20641	20641	1
5	122563	0	-4034	0	0
6	121734	1	-4863	-4863	1
7	169236	2	42639	85278	4
8	103587	3	-23010	-69030	9
9	118152	4	-8445	-33780	16
$\sum X_3 = 45$	$\sum Y_3 = 1139316$			$\sum xy = -47540$	$\sum x^2 = 60$
$\bar{X} = 5$	$\bar{Y}_3 = 126597$				

$$Y_3 = \frac{(\sum xy)}{(\sum x^2)} X = \left( \frac{-47540}{60} \right) x = -792.33 x$$

$$Y_3 - 126597 = -792.33 (X - 5)$$

$$Y_3 = -792.33 X + 130558.65$$

The negative slope of the previous function means that the volume of "land-sea" transit cargo through the Port of Beirut is expected to decrease on the average by -792.33 tons every year. It is to be noted that years 1956 and 1957 have been omitted because they also constitute two extreme years (See Appendix IX).

Year = X	$Y_4 = \text{Sea-Sea}$	$x = X - \bar{X}$	$y = Y_4 - \bar{Y}_4$	xy	$x^2$
1956 = 1	26273	-5	-5762	28810	25
2	31959	-4	-76	304	16
3	39269	-3	7234	-21702	9
4	32074	-2	39	-78	4
5	29005	-1	-3030	3030	1
6	19300	0	-12735	0	0
7	25802	1	-6233	-6233	1
8	39736	2	7701	15402	4
9	36144	3	4109	12327	9
10	27336	4	-4699	-18796	16
11	45485	5	13450	67250	25
$\sum X = 66$	$\sum Y_4 = 352383$			$\sum xy = 80314$	$\sum x^2 = 110$
$\bar{X} = 11$	$\bar{Y}_4 = 32035$				

$$Y_4 = \frac{\sum xy}{\sum x^2} \quad x = \frac{(80314)}{(110)} \quad X = 730.13 X$$

$$Y_4 - 32035 = 730.13 (X-6)$$

$$Y_4 = 730.13 X + 27654.22$$

The preceding function should be multiplied by two because the "Sea-Sea" transit involves unloading the cargo and then loading it again for shipment. Hence, the secular trend for the "Sea-Sea" transit will have the following form with an average rate of increase of 1460.26 tons per annum.

$$Y_4 = 2 (730.13 X) + 2(27654.22)$$

$$Y_4 = 1460.26X + 55308.44$$

Year = X	$Y_5 = \text{Transshipment}$	$x = X - \bar{X}$	$y = Y_5 - \bar{Y}_5$	xy	$x^2$
1956 = 1	12741	-5	-5411	27055	25
2	11099	-4	-7053	28212	16
3	14397	-3	-3755	11265	9
4	16440	-2	-1712	3424	4
5	13676	-1	-4476	4476	1
6	14367	0	-3785	0	0
7	18843	1	691	691	1
8	13023	2	-5129	-10258	4
9	25649	3	7497	22491	9
10	28034	4	9882	39528	16
11	31402	5	13250	66250	25

$$\begin{array}{llll} \sum X = 66 & \sum Y_5 = 199671 & \sum xy = & \sum x^2 = \\ \bar{X} = 6 & \bar{Y}_5 = 18152 & 193134 & 110 \end{array}$$

$$Y_5 = \left( \frac{\sum xy}{\sum x^2} \right) X = \left( \frac{193134}{110} \right) X = 1755.76 X$$

$$Y_5 - 18152 = 1755.76 (X-6)$$

$$Y_5 = 1755.76 X + 7617.44$$

The above function should also be multiplied by two because transshipment involve unloading the cargo and loading it again on another ship. The secular trend for transshipments will therefore take the following form, with an average rate of increase of 3511.52 tons per annum.

$$Y_5 = 2(1755.76 X) + 2(7617.44)$$

$$Y_5 = 3511.52 X + 15234.88$$

#### F. Other Determinants of Demand for Shipping Space in Lebanon

In the foregoing analysis of demand for shipping space in Lebanon, it has been assumed that transit trade and exports through the Port of Beirut have been a function of time and inertia, and secular trends have been derived thus disregarding the real determinants thereof. As regards the determinants of demand for shipping space related to imports, some other



variables have been omitted either because of their non-quantifiable nature, or because relevant data were not available. The purpose of this section is to expose these other variables which would allow us to claim that most of the pertinent determinants would have been engendered had they been included in the model.

1. Competitive Ports:

Prior to 1948, the Port of Haifa was considered as the Port of center of gravity in the area due to its relatively large capacity and its strategic importance. After the unfortunate Palestinian Crisis of 1948, the importance of the Port of Haifa shifted to the Port of Beirut which was to be used as an intermediary for the flow of goods to and out of the neighbouring countries, mainly, Jordan, Iraq, Syria, countries of the Arabian Gulf and even Iran. However, certain events after 1948 tended to minimize the role played by the Port of Beirut as a middleman for channelling the exports from and imports to the neighbouring countries. Consequently, these events tended to automatically decrease the demand for shipping space in Lebanon.

a) The first of these events was the partition of the Syro-Lebanese Customs Union in March 1950. Prior to 1950,

virtually all Syrian seaborne imports and exports were done through the Port of Beirut leaving the Port of Lattakia to play a negligible role in the maritime traffic movement of Syria.<sup>33</sup> After the breakdown of the Syro-Lebanese Customs Union in March 1950, the situation changed and Syria, after introducing great improvements to the Port of Lattakia, started initiating the flow of its waterborne goods through its Port.<sup>34</sup> Ever since that period, the Port of Lattakia started being a competitor to the Port of Beirut as far as transit trade is concerned. Table 16 shows the immediate effect of this event on transit trade via Beirut.

While prior to 1950 virtually all seaborne Syrian goods flowed through Beirut, in 1951, 66% of the waterborne Syrian flow of goods was channelled through the Port of Lattakia and 34% only through Beirut and Tripoli. In 1952 and 1953 75% and 72% respectively were channelled through the Port of Lattakia. Over the years to follow, the flow of Syrian goods via the Port of Beirut, has been diminishing. While in 1954 the flow of goods to Syria through the Port of Beirut marked a level of 144876 tons and from Syria 27150, these figures became

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<sup>33</sup>Danial, Atef, Le Port de Lattaquié dans le Cadre de l'Economie Syrienne (Imprimerie Franco-Suisse, Ambilly-Annemasse, 1961), p.p. 26-7.

<sup>34</sup>Ibid., p. 27

TABLE 16  
 FLOW OF GOODS THROUGH THE PORT OF LATTAKIA  
 AND THE PORTS OF BEIRUT AND TRIPOLI  
 1951 - 1953

	<u>1951</u>	<u>%</u>	<u>1952</u>	<u>%</u>	<u>1953</u>	<u>%</u>
Lattakia						
Exports	90,000	43	265,000	54	353,000	49
Imports	163,000	23	167,000	21	176,000	23
Beirut and Tripoli						
Exports	24,000	11	30,000	6	38,000	5
Imports	170,000	23	210,000	26	205,000	26

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Source: Danial, Atef, Le Port de Lattaquié dans le Cadre de l'Economie Syrienne (Imprimerie Franco-Suisse, Ambilly-Annemasse, 1961), p. 28.

27853 and 20717 tons respectively in 1966 (See Appendix X ).

While this chapter is being written, Syria has announced its decision (early August 1968) to impose a fee of L.L. 100.- on every Lebanese or Saudi Arabian truck passing through the borders of Syria and another L.L. 100.- while leaving the Syrian borders. Added to this is the five percent tax on all Lebanese products passing through Syria on any truck of any

nationality.

Experts have commented that the factors that led Syria to take these measures are political and economic in nature. Discussion of the political factors are not within the scope of this study. Economic-wise experts believe that Syria has the intention of increasing the traffic movement in the Syrian Ports of Lattakia and Tartous especially after the improvements that have been introduced to the latter and the recent connection of the two Ports by a railway network.<sup>35</sup> Jordan has diplomatically solved this problem with Syria and the latter seems to have shown all readiness to offer all available facilities to market the Jordanian phosphate products through its Ports. This measure will definitely affect the movement of transit trade in the Port of Beirut though Jordan has assured the Lebanese authorities that the Jordanian imports and exports will not be shifted to other Ports than Beirut's.<sup>36</sup>

The immediate results of these measures have significant effects on the demand for shipping space in Lebanon. The goods passing in transit via the Port of Beirut to the neighbouring

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<sup>35</sup> Al-Nahar newspaper, Supplement, 18th August 1968, p.5.

<sup>36</sup> Al-Nahar newspaper, 18th August 1968, p. 1.

countries have been accumulating in the warehouses of the Port to such an extent that the Port authorities have claimed that goods are being piled on the quays in the open air and that not one additional case can be added.<sup>37</sup> Furthermore, about ten vessels are waiting in the Port and are unable to unload their carriage because of lack of storing space.<sup>38</sup> Added to this, is the fact that transit trade from and to Saudi Arabia through the Port of Beirut has been disfunctioning ever since Syria started applying its announced decision early August 1968.<sup>39</sup>

The restrictive measures that have been taken by the Syrian authorities may soon be relaxed as a result of the bilateral talks that are taking place between Syria and Lebanon. Yet, this recent event witnesses to the highly important role that may be played by the Syrian Ports as competitors to the Sea Freight Industry in Lebanon.

b) Establishment of the Port of Aqaba:- Shortly after the Palestine War of 1948, Jordan found itself with no access to the Mediterranean Sea and was obliged to use the Ports of Lattakia and Beirut for its overseas trade. Realizing that it

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<sup>37</sup>Lissan-Ul-Hal, August 18th 1968, p.3

<sup>38</sup>Ibid.

<sup>39</sup>Ibid.

should have its own Port facilities for its waterborne flow of goods, the Jordanian Government decided to develop the Port of Aqaba which would ensure contact with the Mediterranean Sea through the Suez Canal. Therefore, the growth of the Aqaba began in 1950 and up to the late fifties it cannot be said that it had a significant influence on the demand for shipping space in Lebanon. Prior to 1956, the facilities available at Aqaba were mainly concerned with vessels of small size as lighters and fishing boats.<sup>40</sup> In 1957, construction of the first deep cargo berth started and was completed in 1959. The construction of this berth was mainly to handle the export of bulk cargo like phosphate and potash, should it be produced, and the imports of petroleum products.<sup>41</sup>

In the early sixties, it became apparent that the first cargo berth attracted a far greater volume of trade than was originally envisaged, and the Jordanian Government decided in 1962 to construct a second cargo berth in order to meet the rapid development of traffic in the Port. This second berth was completed in 1964.<sup>42</sup> By 1961, the Jordanian Government had already enacted a law by which it stipulated that all Jordanian

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<sup>40</sup>The Port of Aqaba, a booklet published by the Hashemite Kingdom of Jordan to commemorate the New York World's Fair of 1964-65, p. 16.

<sup>41</sup>Ibid., p. 20

<sup>42</sup>Ibid.

imports from any where in the world should be done via the Port of Aqaba.<sup>43</sup> This law was simultaneously coupled by the completion of the Highway connecting Aqaba with Amman, thus giving additional facilities to the Jordanian waterborne flow of goods.

The establishment of the Port of Aqaba, the great improvements introduced to it, and the law passed in 1961, tended to have a significant effect on the movement of transit trade through Beirut, as well as on the Sea Freight Industry as a whole. Had it not been for the Port of Aqaba, the Jordanian overseas trade would have tended to be mostly through Beirut thus tending to increase the demand for shipping space in Lebanon. Table 17 shows the Jordanian imports and exports via the Ports of Aqaba and Beirut from 1954 through 1966. It will be noticed that Jordanian imports via the Port of Beirut have been diminishing while through Aqaba they have been increasing. In 1954 Jordanian imports through Beirut constituted about 76% of total imports via the Port of Aqaba, while in 1966 this rate decreased so much to become about 3% only. Note the tremendous increase in imports via Aqaba after

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<sup>43</sup>Aqaba, a booklet published by Amin Kavar & Sons, Chartering and Shipping Agents, 1967, p. 4.

TABLE 17

JORDANIAN IMPORTS AND EXPORTS THROUGH THE PORTS  
OF AQABA AND BEIRUT

1954 - 1966

Year	IMPORTS			EXPORTS		
	Aqaba <sup>1</sup> (tons)	Beirut <sup>2</sup> (tons)	Per cent (2/1 x 100)	Aqaba <sup>1</sup> (tons)	Beirut <sup>2</sup> (tons)	Per cent (2/1 x 100)
1954	80142	60697	75.7	12339	55023	445.9
1955	134625	87135	64.7	66251	90184	136.1
1956	76795	70046	91.2	67336	93594	139.0
1957	47604	89043	187.0	99172	122205	123.2
1958	272405	26093	9.6	137812	90841	65.9
1959	453672	26558	5.8	136634	111806	81.8
1960	461303	44378	9.6	223617	97759	43.7
1961	420295	37066	8.8	311436	75233	24.2
1962	368642	23156	6.3	286493	80011	27.9
1963	451695	25870	5.7	275189	88422	32.1
1964	340323	23361	6.9	493127	121520	24.6
1965	408201	18359	4.5	521634	64340	12.3
1966	590281	20550	3.5	657218	78454	11.9

Source: 1- A report submitted by the Authorities of the Port of Aqaba to the Minister of Transport in Jordan dated 21/1/68.

2- Compiled from "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth, Trafic Maritime, Statistiques Diverses, 1956-66."



1957. This is mainly due to the great improvements introduced after that year. The 1958 political crisis in Lebanon could have had an indirect contribution to this growing importance of the Port of Aqaba. In 1958, Jordan had to channel much of its overseas trade through Aqaba in order to avoid the disturbances prevailing at that time in Lebanon. This most probably, gave the Jordanian importers and exporters the opportunity to discover the great improvements that had been introduced to their own Port, and to start making use of them. As far as the Jordanian exports are concerned, though their flow via Beirut has been fluctuating between a low of 55023 tons and a high of 122205 tons when measured in absolute terms for the period under consideration, yet, this is not the case when they are viewed on relative grounds. Exports via Aqaba have also tremendously increased relative to the exports via Beirut; while in 1954, Jordanian exports through the Port of Beirut were about 446% of the total Jordanian exports via Aqaba for that year, they became in 1966 about 11% only as compared with the exports via Aqaba for the same year.

The foregoing comparison, if it is to show anything, it tends to signify that the Port of Beirut has become insignificant when compared with the Port of Aqaba as far as the Jordanian seaborne trade is concerned. It should be noted, however, that

after the closure of the Suez Canal following the June war of 1967, Jordan started again to rely on the Port of Beirut for its overseas trade thus increasing the demand for shipping space in Lebanon.

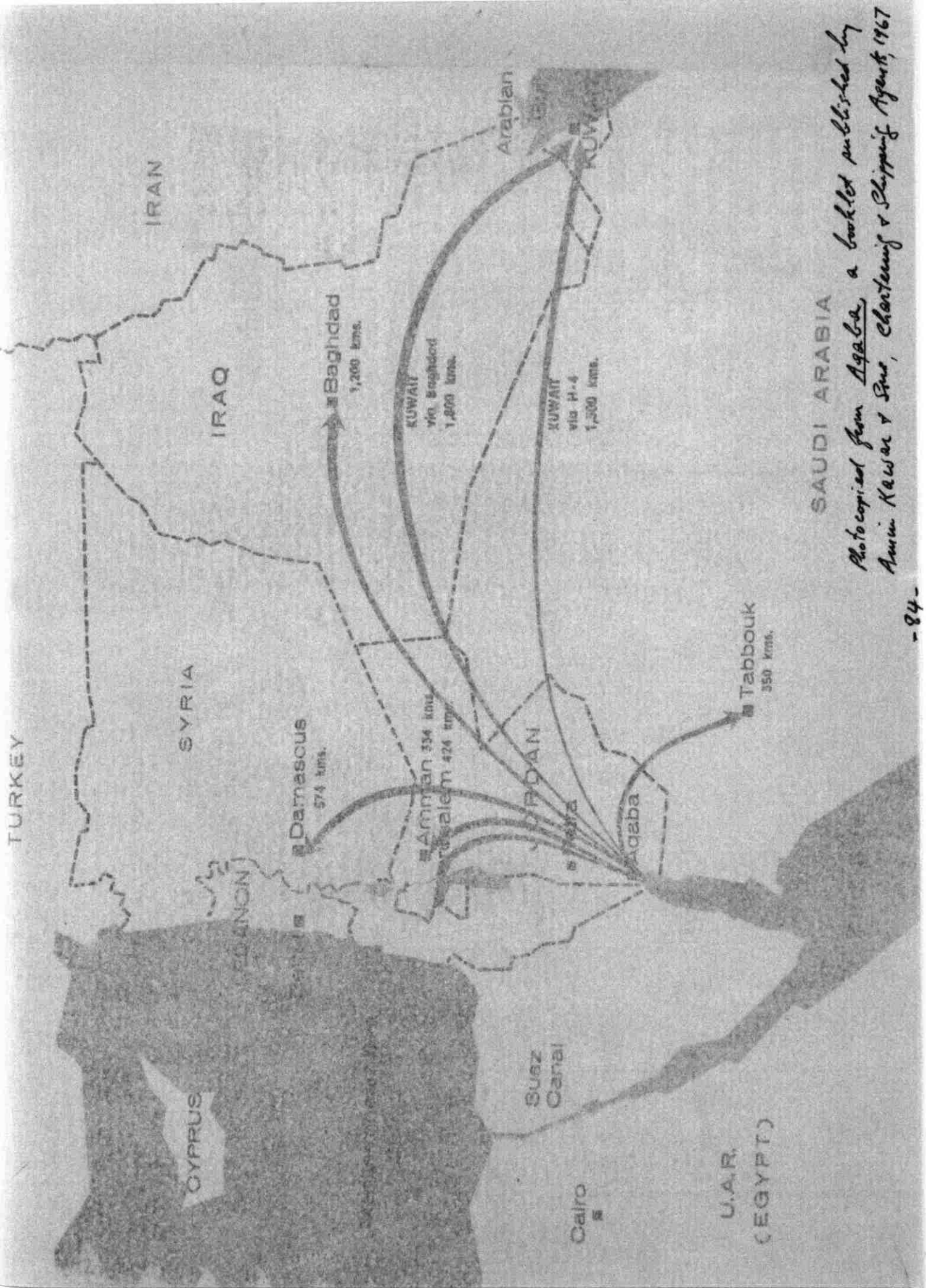
Having a look at the geographic location of the Port of Aqaba (See map on page 84) it will be noticed that Aqaba may be a potential competitor to the Sea Freight Industry in Lebanon as far as the flow of overseas trade of some of the neighbouring countries is concerned. Aqaba may suitably be used as a transit Port to Iraq as well as to the Northern cities of Saudi Arabia such as Tabbouk. Actually, special facilities are now given by the Jordanian Government whereby fifty per cent reduction of all Port fees, except stevedoring, may be given to cargo in transit through Aqaba with an allowance of a longer period of storage.<sup>44</sup>

Early 1966, Jordan agreed with Saudi Arabia to take 25 kms. from the Saudi Arabian territory along the coast of Aqaba in exchange for a larger area in the inland desert given by Jordan.<sup>45</sup> This agreement may render greater possibilities for a further development of the Port of Aqaba and a free zone may be established to facilitate transit trade for which serious

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<sup>44</sup>Ibid., p. 36

<sup>45</sup>Ibid.



SAUDI ARABIA

Photocopied from *Agaba*, a booklet published by Amin Kassar & Sons, Chartering & Shipping Agents, 1967

studies are being conducted.<sup>46</sup> In this respect, Aqaba may potentially be quite a significant competitor to the Sea Freight Industry in Lebanon.

## 2. Competitive Means of Transport:

The alternative means of transport for overseas trade which may have a certain degree of competition with the Sea Freight Industry, is the Air Freight Industry in Lebanon. The ratio between the total cargo moving by air and the total cargo moving by sea in Lebanon is extremely low if not insignificant (See Appendix II). However, there may be a certain degree of competition between the two industries when looking at the cargo movement from the viewpoint of its financial remuneration to each of the industries. This may be the case only when the air freight services tend to be close substitutes for the commodities seeking overseas transportation. When can the air freight service be a close substitute to the Sea Freight service ? To answer this question it will be necessary to indulge in a brief discussion on freight rate determination.

Besides the other factors that tend to determine sea freight rates,<sup>47</sup> the type of cargo in many cases may be the

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<sup>46</sup>Ibid., p. 29

<sup>47</sup>Discussion of these factors will be given in chapter III.

major determinant thereof. The cargo type determinant of sea freight rates are of two kinds, namely, those which are cost-based and those which are revenue-based.<sup>48</sup> In the former case, the freight rate of a specific cargo may be higher or lower because of special handling and carrying problems. For example, in case the cargo seeking the water transport service is coal, it may need special handling and carrying procedures because it may cause dirtiness or may have an awkward shape that may raise stowage problems. In this case, the demand for shipping space is inelastic to competition by the air freight industry, because even if the sea freight rate is doubled, it will not be worthwhile for coal if not at all to seek transportation by air because air freight is much more expensive.

The revenue-based determinants refer to those cargoes which have a high ratio of their value in proportion to their size. e.g. watches. This type of cargo is very important to shipping companies because while the minimum freight rate payable to most of these companies is for the ton, this type of cargo tends to be a good revenue-earner to these companies. Air freight rates are usually charged per kilogram and it is in this type of cargo that airline competition may be most intense. For example, a shipment of a thousand watches which

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<sup>48</sup>O'Loughlin, Carleen, The Economics of Sea Transport (Oxford: Pergamon Press, 1967), p. 130.

in a bulk have a high value to size ratio are worth shipping by air with a greater speed and a higher handling efficiency and for a freight rate which constitutes a low percentage of the total value of the watches.

Hence, the conclusion that may be drawn is that the air freight service may be a substitute for and therefore compete with the sea freight service when the cargo seeking transportation has a high "value to size ratio". It may not be a substitute for the bulkier low-cost cargoes unless these cargoes seek the air freight service for the other advantages it may offer such as speed and efficiency. This may justify the observed fact that the cargo moving by air (measured in tons) is insignificant as compared to the cargo moving by sea, though the value of the former may be greater than the latter.

### 3. Bilateral Trade Agreements:

Another factor that may affect the demand for shipping space in Lebanon is the bilateral trade agreements that may take place between Lebanon and a foreign country. In the analysis of determinants of demand related to imports, the probable effect of bilateral trade agreements was ignored mainly because

of shortage of data on same as well as because of its non-predictable nature. These agreements are not the results of the free interplay of economic forces related to demand and supply but are the result of "administered" endeavors displayed by the responsible authorities. However, some of these economic forces are usually taken as indicators that are channelled towards the initiation of these agreements.

With respect to its exports, Lebanon at any time might sign bilateral trade agreements with foreign countries in order to market for example the excess of its apple production, and actually discussions of this nature are conducted every year between Lebanon and foreign countries.

As regards transit trade, a bilateral trade agreement between a neighbouring country that uses the Ports of Lebanon for its overseas trade and another country may influence the demand for shipping space in Lebanon. The secular trend derived for transit trade via the Port of Beirut, totally neglects the possible effects of these agreements on the flow of transit cargo. At any time, a bilateral or a multilateral trade agreement between a neighbouring country and another may increase or decrease the demand for shipping space in Lebanon.

#### 4. Tastes of the Consumers:

The tastes of the consumers is another factor that has a bearing on the demand for shipping space but has been omitted mainly because of its non-quantifiable nature. The main significance of the tastes of the consumers in a demand analysis for shipping space is that they show the types of commodities that are to seek the water transport service. For example, if the tastes of the Lebanese consumers turn to buying American big cars instead of European medium and small cars, this will tend to engender a shift in the demand curve for shipping space in Lebanon because of a change in the tastes of the consumers. This will mean a longer trade route, a higher freight rate and more shipping space may be demanded if the same number of cars is to be imported. The same analogy may be drawn in case of exports where a change in the tastes of the consumers of the importing countries from Lebanon may influence the demand for shipping space in Lebanon. Similarly for the tastes of the consumers of the neighbouring countries and the consumers tastes of the other countries importing from them.

Tastes of the consumers is a very dynamic factor because the consumers are constantly exposed to many stimuli that tend to change their tastes very quickly. Analysis of this factor



falls within the realm of behavioral sciences which is not within the scope of this study. For the purpose of forecasting total demand for shipping space in Chapter IV it will be assumed that the changes in the tastes of the consumers have been a function of time and secular trends will be derived to break down the projections into the different classes of commodities passing through the Port of Beirut.

5. Changes in the pattern of Income Distribution:

It is believed that changes in the distribution of income has a bearing on the demand for shipping space in Lebanon on the grounds that the marginal propensity to consume of one sector of the population that falls within a certain income bracket, differs from that sector which falls in a different income bracket. Had the required data for changes in the income distribution pattern for Lebanon been available, this factor would have been incorporated into the model and hypothesized to be one of the determinants of demand related to imports. The only idea that can be developed about the pattern of income distribution in Lebanon, is from the study conducted by Irfed Mission for 1960-61.

Table 18 shown this distribution arrived at through this study.

TABLE 18

PATTERN OF INCOME DISTRIBUTION IN LEBANON

<u>Per Cent of Total Population</u>		<u>Maximum Annual Income Per Family (L.L.)</u>
About	9	1200
"	40	2500
"	30	5000
"	14	15000
"	4	over 15000

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Source: Mission Irfed, Besoins et Possibilités de Développement du Liban, Tome 1, Situation Economique et Sociale, 1960-4 p. 93

Irfed Mission estimated the average income per family composed of five persons to be L.L. 5000 per annum. Hence, as shown in Table 18 only 18 per cent of the total Lebanese population is above the average and the remaining is below the average. Changes in this pattern of income distribution over the years may have a significant effect on the demand for consumer goods and subsequently on the demand for shipping space in Lebanon. For example, an increase in the income of the population falling in the L.L. 1200 income bracket may result in an additional demand for the consumer goods that are necessary for subsistence, such as wheat, clothing, shelter

and so forth. On the other hand, an increase in the income of that sector of the population falling within the last income bracket may result in an increase in the demand for more luxurious items such as big cars, sophisticated food and so forth. In the former case, the additional income is expected to be totally spent because of a low marginal propensity to save among the poorer classes while in the latter case the marginal propensity to save is expected to be much higher and not all additional income is expected to be spent. Hence, changes in the pattern of income distribution in Lebanon may be quite informative as far as the demand for consumer goods and therefore for imports is concerned; its inclusion in the model depicting the determinants of demand related to imports would have been expected to contribute to the explanation of the dependent variable.

#### 6. Freight Rates:

One of the main axioms of economic theory, is that, ceteris paribus, the quantity of a good or a service demanded will tend to increase if the price of that good or service is reduced. On these grounds, it was intended to incorporate freight rates as a variable into the model depicting demand

for shipping space in Lebanon. Attempts were displayed to construct a weighted freight rate index for the imported sea-borne goods to Lebanon in order to add it to the determinants of demand related to imports. The writer has been unable to get the required data in this respect because the local shipping agents do not have the freight rate tariff of the incoming cargo. These freight rates are supposed to be included in the bills of lading for the imported goods, but are not, mainly for competition purposes.<sup>49</sup> However, as already mentioned, demand for shipping space has proven to be inelastic to changes in the freight rates<sup>50</sup> and therefore, their inclusion in the model depicting demand for shipping space in Lebanon would have expected to contribute very little to the explanation of the dependent variable.

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<sup>49</sup>Interview with Mr. Jolly, President of Messrs. Heald & Co., on 9/7/68.

<sup>50</sup>Refer to pages 24 and 25.

## CHAPTER III

### STRUCTURE OF THE SEA FREIGHT MARKET IN LEBANON

It is intended in this chapter to discuss the composition of the Sea Freight Market in Lebanon, the types of services rendered, and finally the way freight rates are being determined.

#### A. Structure of Ownership

There are two general types of ownership in shipping, namely, the liner Companies and the Tramp Owners. A summarized definition of the former type is that which operates vessels that follow predetermined time and route schedules, and that offer cargo space at fixed rates to different shippers who wish their goods to be transported by sea. Liner Companies may either operate within conferences or non-conferences. "A conference is an association of competing liner owners engaged in a particular trade who have agreed to limit competition existing among themselves." <sup>51</sup> The non-conference liners may therefore operate independently on a

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<sup>51</sup>Sturmey, S.G., British Shipping and World Competition (London: The Athlone Press, 1962), p. 324

route that may not be covered by conference liners or may be in competition with conference liners on the same trade routes.

Tramp owners, on the other hand, operate vessels that move about the world in search of, or carrying, cargoes on charter basis. The tramp vessel may be chartered on a time basis where the contract is for a certain stipulated period of time, or on a voyage basis where the vessel is usually engaged to load a full cargo to be carried between any two points without being tied to a certain fixed route. When the Tramp vessel is chartered, it falls under the charterer's orders from the commencement of the charter period (whether time or voyage) until it is discharged and handed back to her owner ready to undertake a different trip.<sup>52</sup> This distinguishing feature of tramp shipping provides an important element of flexibility to international trade.

Chartering is an art by itself because the operator should be knowledgeable of market conditions at all times in order to know whether to time charter or voyage charter his vessels. This requires due and keen consideration to world

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<sup>52</sup>Ibid., p. 250

events as well as to the pure economic aspects of business, because the decision of whether to time or voyage charter depends on the future expectations of each of the separate markets of the world.<sup>53</sup> Professor S.G. Sturme<sup>y</sup><sup>54</sup> cites four advantages accruing to tramp shipping on time basis:

a) A time-charter obtained before a ship is built may be used as a security for a construction loan in case this loan is needed.

b) A time-charter executed in a period of profitable rates, remains to be profitable if during the same period voyage rates happen to fall; as an offset to this, subsequent rises in voyage rates cannot be enjoyed. Hence, the ideal situation for a tramp owner is to time charter his ships at the peak of the business cycle and on the early stages of its decline, and to voyage charter them on the upturn of the cycle.

c) When the vessel is time chartered and its employment is secured, it follows instructions from the charterer;

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<sup>53</sup>O'Loughlin, p.p. 144-148

<sup>54</sup>Sturme<sup>y</sup>, p.p. 258-261

this tends to give way to the managerial capacity of the tramp owner to attend to other vessels. Unlike liner companies, this feature would tend to increase the tonnage one management can handle.

d) Once time-charters are executed, they tend to involve few risks for the shipowner and therefore tend to provide a cushion for earnings in bad periods.

1. Structure of Ownership in Lebanon:

The same broad classification discussed in the foregoing few pages, applies to the structure of shipping ownership in Lebanon with some reservations. Classifying the ownership of shipping companies in Lebanon according to the types of services rendered, it is found that there are those that offer tramp shipping services and those that offer regular shipping services or both. Classifying these companies according to ownership of vessels proper, it is found that the owner companies are few in Lebanon. An owner company refers to that shipping company which owns ships and which looks only after their maintenance and operation. These companies do not meet clients; each of them is represented by a shipping



agent who meets the clients and who promotes the services of the owner company in accordance with the instructions received from the latter.<sup>55</sup> The shipping agents who are operating in Lebanon are therefore all representatives of owner companies either Lebanese or foreign. A single shipping agent may be the representative of one or more owner companies usually operating on different trade routes. The reason behind the few number of owner companies in Lebanon, may be mainly attributed to the huge capital required for owning and maintaining a ship, as well as to the need for highly qualified people to run such a type of companies.

Table 19 depicts the distribution of market shares for 1966 classified according to the different nationalities of owner companies that have permanent agents in Beirut. The permanent agents are mainly those that represent the owner companies that have regular trade routes passing through Lebanon, on a relatively continuous basis. These owner companies are usually conference liners. The non-permanent shipping agents on the other hand, represent the owner companies that have intermittent or irregular contacts with the Port of Beirut. These owner companies are mainly non-conference liners and/or tramp owners.

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<sup>55</sup> Interview with Mr. Paul Zahlan, General Manager of the National Shipping Co., on 23/7/68.

It is noticed from Table 19 that 65.83% of the inward cargo, 66.63% of the outward cargo, and 65.99% of the total cargo movement are covered by the owner companies that have permanent agents in Beirut. This is in contrast to 31.61% of the inward cargo, 25.05% of the outward cargo and 30.27% of the total cargo that are covered by owner companies that do not have permanent agents in Beirut. The remaining 2.56%, 8.32% and 3.74% respectively are being covered by "sailing boats" of short travelling distances.

Looking at the owner companies that have permanent agents in Beirut, it is further noticed that the Lebanese owner companies, six in number, enjoy the biggest share of the outward cargo, namely, 15.41%. While the Lebanese owner companies tend to rank first with respect to the outward cargo, their share is only 5.36% with respect to the total cargo movement where they rank second after the Italian owner companies that hold a share of 6.86% of the total cargo. The drop in the share of the Lebanese owner companies from 15.4% of the outward cargo to 5.36% of the total cargo is due to their relatively smaller share in the inward cargo which

TABLE 19

CONCENTRATION OF THE SEA FREIGHT MARKET  
CLASSIFIED ACCORDING TO NATIONALITIES  
OF OWNER COMPANIES

1966

Nationality of Owner Company	Cargo unloaded in the Port of Beirut		Cargo loaded in the Port of Beirut		Total Cargo in the Port of Beirut	
	Tons	%	Tons	%	Tons	%
American	117226	6.47	22621	4.85	139847	6.14
Belgium	32305	1.78	4069	.87	36374	1.60
Brazilian	22754	1.26	4	-	22758	1.00
Bulgarian	51230	2.83	3836	.82	55066	2.42
Ceylon	1705	.09	3705	.80	5410	.24
Check.	10290	.58	9	-	10299	.45
Danish	25792	1.42	2458	.53	28250	1.24
Dutch	88579	4.89	32136	6.89	120715	5.30
Egyptian	5809	.32	2043	.44	7852	.34
Ethiopian	1961	.11	642	.14	2603	.11
British	110506	6.10	9653	2.07	120159	5.28
Finnish	3327	.18	1	-	3328	.15
French	6447	.36	2406	.52	2853	.40
W. German	93289	5.15	3701	.79	96990	4.26
Greek	39364	2.17	16195	3.47	55559	2.44

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TABLE 19 --- (Continued)

Nationality of Owner Company	Cargo unloaded in the Port of Beirut		Cargo loaded in the Port of Beirut		Total Cargo in the Port of Beirut	
	Tons	%	Tons	%	Tons	%
E. German	51651	2.85	18314	3.93	69965	3.07
Hungarian	20530	1.13	4639	1.00	25169	1.10
Italian	121406	6.70	34876	7.48	156282	6.86
Japanese	9737	.54	1331	.28	11068	.48
Kuwaiti	-	-	17	-	17	-
Lebanese	50275	2.78	71871	15.41	122146	5.36
Norwegian	29651	1.64	6274	1.34	35925	1.58
Polish	26636	1.47	8618	1.85	35254	1.55
Rumanian	39226	2.17	5897	1.26	45123	1.98
Russian	52724	2.92	7818	1.68	60542	2.66
Spanish	33563	1.85	5497	1.18	39060	1.72
Swedish	74856	4.13	8777	1.88	83633	3.67
Turkish	19119	1.06	6174	1.32	25293	1.11

*Amica*

TABLE 19 ----(Continued)

Nationality of Owner Company	Cargo unloaded in the Port of Beirut		Cargo loaded in the Port of Beirut		Total Cargo in the Port of Beirut	
	Tons	%	Tons	%	Tons	%
Yugoslavian	52165	2.88	27209	5.83	79374	3.84
Sailing Boats	46380	2.56	38804	8.32	85184	3.74
Others <sup>a</sup>	572523	31.61	116796	25.05	689319	30.27

a- Refer to ships that do not have permanent agents in Beirut.

Source: Compiled and calculated by the Author from "La Compagnie de Gestion et d'Exploitation  
du Port de Beyrouth" Trafic Maritime, Statistiques Diverses, 1966

amounts to 2.78% only. The Italian owner companies also rank first in respect of the inward cargo with a share of 6.70%. Next in turn are the American owner companies that enjoy 6.47% of the inward cargo.

Table 20 shows the distribution of market shares for the same year 1966 classified according to the permanent agents that represent the owner companies depicted in Table 19. A noticeable feature from this distribution is that it is almost even; there is not an agent who enjoys a significantly large share of the market as a whole. The biggest share is owned by F. Khayat which amounts to 4.05% of the total cargo movement. Catoni & Co and Cory Brothers rank second each with a share of 3.94% of the total cargo movement. With respect to the inward cargo, Catoni & Co ranks first with a share of 4.47%. Next comes Henry Heald and Co with a share amounting to 4.12% of the cargo unloaded. As regards the outward cargo, F. Khayat has been able to carve out the biggest share thereof, namely, 12.14%. Following are Arghiris and the Union Shipping and Chartering with shares amounting to 5.90% and 5.39% respectively.

TABLE 20

MARKET SHARE DISTRIBUTION OF THE  
PERMANENT SHIPPING AGENTS IN BEIRUT

1966

Name of Agency	Cargo Unloaded		Cargo Loaded		Total Cargo	
	Tons	%	Tons	%	Tons	%
Abu Hamad, G.	26636	1.47	8618	1.85	35254	1.55
Adriatica	48121	2.66	10688	2.29	58809	2.58
American Lebanese	7034	0.40	172	0.04	7206	0.32
American Levant	16304	0.90	159	0.03	16463	0.72
Argiris Maritime	16042	0.90	27509	5.90	43551	1.91
Balgis	7853	0.43	4605	0.99	12458	0.55
Béja, J.	16307	0.90	1863	0.40	18170	0.80
Carapiperis	56380	3.11	5541	1.19	61921	2.72
Catoni & Co.	80996	4.47	8692	1.86	89688	3.94
Cedar Maritime	21145	1.17	653	0.14	21798	0.96
Comptoir Maritime	1738	0.10	1241	0.27	2979	0.13
COIM, Me	1705	0.09	3705	0.79	5410	0.24
Cory Bros.	71381	3.94	18314	3.93	89695	3.94
Cotts & Khayyat	2999	0.16	262	0.06	3261	0.14

TABLE 20 --- (Continued)

Name of Agency	Cargo Unloaded		Cargo loaded		Total Cargo	
	Tons	%	Tons	%	Tons	%
Daher & Co	23112	1.28	6631	1.42	29743	1.31
Delbourg & Sons	-	-	563	0.12	563	0.02
Eddé, A.	2637	0.14	588	0.13	3225	0.14
Gargour, T.	48172	2.66	870	0.19	49042	2.15
Gazoui, A.	2743	0.15	678	0.14	3421	0.15
Gazoui & M.E. Agents	25435	1.40	3525	0.76	28960	1.27
Ghandour, F.	37618	2.08	6281	1.35	43899	1.93
Habet, A.	2000	0.11	4822	1.03	6822	0.30
Haddad Ets.	6870	0.38	544	0.12	7414	0.32
Hammoud Bros.	5809	0.32	2043	0.44	7852	0.34
Heald, H.	74697	4.12	9122	1.96	83819	3.68
Ib. Naccache	3052	0.17	70	-	3122	0.14
Karnak	770	0.04	132	0.03	902	0.04
Khayat, F.	35623	1.97	56630	12.14	92253	4.05
Litex	27160	1.50	1313	0.28	28473	1.25
Mantoura, R.	21019	1.16	4894	1.05	25913	1.14



TABLE 20----(Continued)

Name of Agency	Cargo Unloaded		Cargo Loaded		Total Cargo	
	Tons	%	Tons	%	Tons	%
Mediterranean Mrt.	179	-	-	-	179	-
Madmar Shipping	1654	0.09	2083	0.45	3737	0.16
Mobil Oil Leb.Inc.	67701	3.74	7875	1.69	75576	3.32
National Shipping	57140	3.16	6657	1.43	63797	2.80
Orient Shipping	3565	0.20	12987	2.78	16552	0.73
Pharaon, R.	52219	2.89	6467	1.39	58686	2.58
Riga Bros.	904	0.05	2020	0.43	2924	0.13
Raissis, L.	-	-	17	-	17	-
Saaden, R. & Co.	22526	1.24	12120	2.60	34646	1.52
Sabbagh, L.	31339	1.73	16413	3.52	47752	2.10
Sehnoui, E.	13023	0.72	863	0.18	13886	0.61
Spemar Leb.Shipp.	39203	2.16	7097	1.52	46300	2.03
Sultani, M.	269	0.01	1573	0.34	1842	0.08
Transas Co.	505	0.03	1351	0.29	1856	0.08

TABLE 20----(Continued)

Name of Agency	Cargo Unloaded		Cargo Loaded		Total Cargo	
	Tons	%	Tons	%	Tons	%
Transliban Shipping	70401	3.89	3198	0.68	73599	3.23
Union Shipping & Chartering	50511	2.80	25126	5.39	75637	3.33
United Shipping and Sehnoui	24369	1.34	5154	1.10	29523	1.30
Zehil, A.	65257	3.60	9062	1.94	74319	3.26
TOTAL	1192123	65.83	310791	66.63	1502914	65.99

Source: Compiled and calculated by the Author from "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth," Trafic Maritime, Statistiques Diverses, 1966.

The owner companies that are represented by agents on a permanent basis are conference- members (probably with few exceptions) that offer regular services according to predetermined route and time schedules. The remaining owner companies that are not represented by agents on a permanent basis are partly composed of non-conference liners, partly of tramp owners and most probably of some conference liners that do not have agents in Beirut on a permanent basis.

## 2. Pattern of Cargo Movement:

Table 21 depicts the pattern of the total cargo movement affiliated to the Port of Beirut both in absolute as well as in relative terms. During the four years included in the mentioned table, the lack of symmetry between the inward and outward cargoes is a feature thereof. This asymmetrical pattern may be one of the main reasons as to why the regular shipping service is a predominant feature of the Sea Freight Market in Lebanon. The tramp shipping service is not justifiable because the vessels would be coming to Beirut with a full load, but most of them would tend to leave it in ballast, or with low utilization factors. Hence, regular shipping is justified on the grounds that while the liner may be fully loaded on its inward trip, may be

TABLE 21

PATTERN OF CARGO MOVEMENT AFFILIATED  
TO THE PORT OF BEIRUT

Area	1966		1965	
	Unloaded	%	Unloaded	%
West Europe	681069	37.61	608291	35.43
East Europe	331763	18.32	324380	18.89
Asian Arab Countries	13243	.74	79622	4.64
African Arab Countries	63822	3.52	87833	5.11
Other Asia	168590	9.31	115528	6.73
Other Africa	29535	1.63	14238	.83
North America	353535	19.52	272168	15.85
South America	60666	3.35	85513	4.98
Scandinavia	47665	2.63	44757	2.61
Australia	61138	3.37	84604	4.93
	1811026	100.00	1716934	100.00
			466391	100.00
			453310	100.00
			8978	1.98
			95	-
			3074	.68
			9	-

TABLE 21 ---(Continued)

Area	1961		1957	
	Unloaded	%	Loaded	%
West Europe	669844	49.28	58349	20.67
East Europe	119957	8.83	1033773	36.77
Asian Arab Countries	11771	.87	42205	14.95
African Arab Countries	84694	6.23	39698	14.06
Other Asia	91747	6.75	27935	9.90
Other Africa	16860	1.25	598	.21
North America	156339	11.50	8551	3.04
South America	39057	2.87	27	-
Scandinavia	73839	5.43	1097	.40
Australia	95017	6.99	-	-
	Unloaded	%	Unloaded	%
	669844	49.28	842638	55.27
	119957	8.83	111332	7.30
	11771	.87	48101	3.15
	84694	6.23	139799	9.17
	91747	6.75	93174	6.11
	16860	1.25	9796	.64
	156339	11.50	198422	13.01
	39057	2.87	49690	3.26
	73839	5.43	31853	2.09
	95017	6.99	-	-
	<u>1359125</u>	<u>100.00</u>	<u>1524805</u>	<u>100.00</u>
	=====	=====	=====	=====
	282233	100.00	493369	100.00
	=====	=====	=====	=====

Source: Compiled and calculated by the author from "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth, Traffic Maritime Statistiques Diverses, 1957, 1961, 1965 and 1966.

scheduled to pass by neighbouring ports on its way back in order to serve other trade routes that may raise its utilization factor on the outward trip. This scheduling process is a science by itself which requires much research on multinational trade.

Considering the relative terms in the pattern of cargo movement affiliated to the Port of Beirut (Table 21), some changes have occurred therein since 1957. While in 1957, sea-borne trade from West Europe constituted 55.27% of the total inward cargo, in 1961 this figure dropped to 49.28%, in 1965 to 35.43% and in 1966 marked a level of 37.61%. Similarly, and measured on relative grounds, sea-borne cargo from the Arab countries in Asia and Africa have been following a downward trend. These declines have been offset by rising trends from other areas especially East Europe. While sea-borne cargo from East Europe constituted 7.30% of the total cargo unloaded in the Port of Beirut, this figure became 18.32% in 1966. Similarly, sea-borne cargo has been relatively increasing from other Asian and African countries, from North and South America and from Australia.

Regarding the loaded sea-borne cargo, the relative major declines therein have been to West and East Europe. While in 1957 the cargo loaded to West Europe was equivalent to 33.01% and to East Europe 30.73% of the total cargo loaded, these figures became 18.48% and 24.36% respectively in 1966. These declines have been mainly offset by relative increases in the sea-borne loaded cargo to countries in Asia (Arab countries inclusive). While in 1957, the cargo loaded to the Arab countries in Asia constituted 9.00% and to other Asian countries 10.56% of the total outward cargo, these figures increased to 21.49% and 17.79% respectively in 1966.

Follow up of these changes in the pattern of total cargo movement affiliated to the Port of Beirut, is equally important to liner companies as well as to tramp owners. By noticing these directional changes in the movement of cargo, liner companies may be assisted in their scheduling process, and tramp owners may also be assisted in deciding where to send their ships in search of cargo.

## A. Freight Rate Determination

### 1. Liner Rates:

The agents in Lebanon that are representatives of conference liner companies do not themselves determine the freight rates to be charged to the different types of cargo; they rather receive schedules in this respect from the liner companies whom they represent. These liner companies meet in conferences and decide on the freight rates to be charged on the different classes of cargo on different trade routes.<sup>56</sup> Liner freight rates are therefore administered by conferences.

When the owner shipping company is established, it invests huge amounts of capital in buying ships, in operating them as well as in maintaining them. Their fixed costs by way of depreciation and wages of seamen are therefore expected to be high in relation to their variable costs. Hence, in order to avoid cut-throat competition, to cover operating costs, and to ensure sufficient earnings, liner companies have decided to meet in conferences in order to achieve these aims and to spread the risk among them on equitable basis.<sup>57</sup> Among the many means used by these conferences to achieve these aims, has been the

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<sup>56</sup>Interview with Mr. Paul Zahlan, General Manager of the National Shipping Co., on 23/7/68.

<sup>57</sup>Svendsen, p.p. 341-51.



establishment of fixed freight rate schedules to be applied by all conference members without exceptions. How are these schedules determined and on what basis?

In practice, the conference operators divide goods into several classes on the basis of the value of the goods, their nature and their loadability.<sup>58</sup> Then rates for each class of the goods related to a number of ports are compiled by giving due consideration to the balance of inward and outward cargo movements affiliated to each specific port, to the distance to be steamed, and to the handling and port charges that usually differ from one port to another.<sup>59</sup> On the basis of these general considerations that need deep analysis and scrutiny, freight rate schedules for the different classes of goods on different trade routes are constructed.

Professor S.G. Sturme<sup>60</sup>y argues that liner freight rates are to be established at such a level as to fulfill the following conditions:

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<sup>58</sup>Sturme<sup>y</sup>, p.p. 333-5

<sup>59</sup>Ibid.

<sup>60</sup>Sturme<sup>y</sup>, S.G., A report on Ocean Freight Rates, an Economic Research submitted to the United Nations Conference on Trade and Development (UNCTAD), on 5/5/66, p. 14.

- a) To cover the costs of handling all the cargo.
- b) To cover the costs of fuel, wages, stores, port charges and others involved in making the trip.
- c) To cover agency charges and the general overhead charges of the operating organization.
- d) To provide for depreciation so that at the end of the life expectancy of the ship funds to replace the ship are available.
- e) To provide the owner with a reasonable return of the risks and efforts of supplying the service.

A participant in a seminar on shipping economics <sup>61</sup> suggested that there are two sets of factors that enter into the making of liner rates and that, he suggested, should be quantitatively examined:

- a) The cost factors, where the level of total liner costs sets minimum and maximum limits to the general level of freight rates. The minimum limit is determined at such a level as to cover total long-run costs, including profit. On the other hand, the maximum limit for the level of rates must be set at such a

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<sup>61</sup> Shipping and the World Economy, Report of a Seminar on Shipping Economics held by the United Nations Conference on Trade and Development, (UNCTAD), United Nations, 1966, p.p. 6-7.

level where the risk of an outsider trying to get into the conference is considered to be small by the members. The participant adds that the total costs of the liner company also determine the minimum and maximum limits not only for the general freight rate level but for the individual commodity rates as well. The minimum limit for the individual commodity rate is set by the long-term marginal cost of having as compared with not having the commodity in question for carriage. The maximum limit, on the other hand, is set by freight rates offered by competitive means of transport after giving due consideration to differences in service.

- b) **Non-cost Factors:** While the cost factors determine only the limits of the range within which freight rates tend to lie, the participant added that the precise level of rates within these limits is then determined by other non-cost factors which he does not specify. However, in the short-run, rates can lie outside the limits due to a response to temporary changes in demand.

Bearing in mind that the level of the liner's total costs is a major determinant of conference liner rates, and considering the fact that different liner companies tend to possess different cost structures, many problems could be envisaged to always occur in conference freight rate determination. An individual conference member that may have a relatively low total cost level, may have a bargaining power that can undercut its rivals in the conference. Another individual conference member may be specially interested in the transport of one specific type of cargo, and in consequence, may bargain for the procedures that will only enhance the flow of that specific type of cargo. Many problems may present themselves in these conferences, discussion of which lies beyond the scope of this study.

A final conclusion that may be drawn from the foregoing discussion is that while conference liner companies apply the same freight rates, and while most of the permanent agents in Beirut represent conference liner companies, then price competition among these agents is almost non-existent. Quality competition may be predominant in terms of speed, space, specialization and the like.

2.- Tramp Rates:

Unlike liner rates, the determination of tramp freight rates is not regulated by any force except the economic forces of supply and demand for the tramp service. In practice, it is the bargaining power of the tramp owner on the one hand, and the charterer on the other, that sets the precise freight rate for the tramp service. In essence, the tramp owner and the charterer represent the practical sides of supply and demand for the tramp service. The minimum freight that may be acceptable by the tramp owner, at least in the short-run, is that at which the tramp owner would prefer to lay-up his ship rather than to charter it. The charterer on the other hand, would weigh the alternative available for transporting his goods to their destination, and would take a decision that is most suitable to his needs.

CHAPTER IV  
PROJECTION OF DEMAND FOR SHIPPING  
SPACE IN LEBANON

A. Projection of Total Cargo Movement  
in the Port of Beirut

Table 22 depicts the projected total cargo movement in the Port of Beirut from 1967 through 1971. It is noticed therefrom that the total projected increase in cargo movement between 1967 and 1971 is expected to be 260681 tons, where the inward cargo is expected to increase by 226294 tons and the outward cargo by 34387 tons only

B. Total Projected Cargo Classified  
According to Points of Origin and  
Destination

The methodology followed in classifying the projected inward and outward cargoes through the Port of Beirut, is by taking the percentage distributions of same for the major countries of origin and destination, then by deriving secular trends for these percentages, and finally by applying their projections to the forecasted inward and outward cargoes

TABLE 22  
TOTAL PROJECTED CARGO MOVEMENT IN THE PORT  
OF BEIRUT  
(Tons)

	1967	1968	1969	1970	1971
<b>Inward Cargo:</b>					
Imports	1501005	1552405	1601745	1651019	1702458
Sea-Land	178808	182533	186258	189982	193707
Sea-Sea	36416	37146	37876	38606	39336
Transshipments	28687	30443	32198	33954	35709
Total Inward Cargo	1744916	1802527	1858077	1913561	1971210
<b>Outward Cargo:</b>					
Exports	248613	255517	262420	269324	276227
Land-Sea	122635	121843	121051	120250	119466
Sea-Sea	36416	37146	37876	38606	39336
Transshipments	28687	30443	32198	33954	35709
Total Outward Cargo	436351	444949	455345	462142	470738
Total Cargo Movement	2181267	2247476	2311622	2375703	2441948

Source:—The projected figures for imports are based on the projections computed in Appendix XI for the six independent variables that were substituted in the mathematical model presented on page 45.

—The projected figures related to exports and transit trade are based on the secular trends derived on pages 67 through 73.

TABLE 23

PERCENTAGE DISTRIBUTION OF THE INWARD  
CARGO CLASSIFIED ACCORDING TO MAJOR  
COUNTRIES OF ORIGIN

	1959	1960	1961	1962	1963	1964	1965	1966
U.S.A.	<u>16.43</u>	<u>13.26</u>	<u>10.76</u>	<u>9.16</u>	<u>7.45</u>	<u>8.31</u>	<u>15.37</u>	<u>18.96</u>
Italy	7.63	9.59	13.30	13.36	13.02	10.45	12.43	13.26
Rumania	1.59	1.97	3.06	5.17	9.37	12.30	8.72	8.19
Britain	4.31	3.92	5.21	4.19	4.46	4.24	4.00	4.57
France	7.23	7.03	9.43	7.85	6.81	7.24	5.45	5.17
Belgium	7.28	8.54	9.42	9.67	8.61	7.62	4.49	5.41
Holland	5.26	4.57	5.37	4.67	3.93	3.58	3.80	4.11
W. Germany	6.50	6.17	4.69	4.42	5.35	4.64	3.91	3.56
Greece	.45	.50	.42	.82	.88	.66	.96	3.71
Bulgaria	.48	.81	1.26	.92	.72	.78	1.62	2.90
Yugoslavia	1.90	1.86	1.51	1.39	3.29	3.27	3.46	2.62
Australia	2.23	1.66	6.99	9.09	6.57	7.98	4.93	3.38
Egypt	8.02	5.96	5.47	4.46	5.07	5.30	3.91	2.96
USSR	6.00	2.53	2.03	2.80	3.60	2.25	1.89	1.80
Others	24.69	31.64	21.07	22.02	20.87	21.39	25.05	19.42

Source: Compiled and calculated by the Author from "La Compagnie de Gestion at d'Exploitation du Port de Beyroth", Traffic Maritime, Statistiques Diverses, 1959-1966.



TABLE 24

PERCENTAGE DISTRIBUTION OF THE OUTWARD CARGO  
CLASSIFIED ACCORDING TO MAJOR COUNTRIES OF  
DESTINATION

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>
Britain	4.26	1.89	2.48	5.60	2.99	2.31	2.44	2.53
Ceylon	1.52	1.71	1.90	3.70	3.83	4.53	9.78	5.88
Cyprus	3.87	2.66	3.42	4.52	5.82	2.75	3.09	5.48
E. Germany	0.00	0.00	0.00	0.00	0.00	1.98	2.31	2.64
W. Germany	4.13	4.86	4.42	6.43	5.48	3.34	3.16	1.53
France	5.72	2.86	2.37	8.02	3.80	2.61	4.80	2.25
Greece	.32	1.85	.46	.86	1.64	1.97	6.40	1.30
Italy	4.47	6.17	7.31	7.48	10.05	7.46	11.20	8.95
Libya	.29	.45	.27	.47	.66	1.11	2.62	7.59
Palestine	1.58	2.27	2.08	1.98	5.72	4.22	2.70	2.66
Rumania	13.07	18.77	25.83	17.46	8.20	10.52	14.60	14.61
S. Arabia	6.93	6.23	5.15	4.91	5.48	8.95	7.26	10.54
Spain	.01	2.13	.83	.03	.10	.25	4.44	.76
Egypt	7.64	7.20	11.13	5.89	3.40	2.68	5.16	3.23
Others	46.96	40.96	32.35	32.65	42.81	45.31	20.04	30.06

Source:

Compiled and calculated by the Author from "La Compagnie de  
Gestion et d'Exploitation du Port de Beyrouth," Trafic Maritime,  
Statistiques Diverses, 1959 - 1966.

TABLE 25

PROJECTED PERCENTAGE DISTRIBUTION OF THE  
INWARD CARGO CLASSIFIED ACCORDING TO MAJOR  
POINTS OF ORIGIN

	1967	1968	1969	1970	1971
U. S. A.	13.50	13.73	13.96	14.19	14.42
Italy	14.00	14.53	15.06	15.59	16.12
Rumania	12.27	13.60	14.93	16.26	17.59
Britain	4.38	4.38	4.38	4.38	4.38
France	5.39	5.03	4.67	4.31	3.95
Belgium	5.53	5.06	4.59	4.12	3.65
Holland	3.49	3.28	3.07	2.86	2.65
W. Germany	3.24	2.87	2.50	2.13	1.76
Greece	2.45	2.76	3.07	3.38	3.69
Bulgaria	2.22	2.45	2.68	2.91	3.14
Yugoslavia	3.49	3.73	3.97	4.21	4.45
Australia	6.72	7.02	7.32	7.62	7.92
Egypt	2.72	2.18	1.64	1.10	.56
USSR	1.20	.83	.46	.09	-
Others	19.40	18.55	17.70	16.85	15.72

Source: Based on the secular trends for inward cargo presented in Appendix XII

TABLE 26

PROJECTED PERCENTAGE DISTRIBUTION OF THE OUTWARD  
CARGO ACCORDING TO MAJOR POINTS OF DESTINATION

	1967	1968	1969	1970	1971
Britain	2.38	2.23	2.08	1.93	1.78
Ceylon	8.34	9.28	10.22	11.16	12.10
Cyprus	4.62	4.77	4.92	5.07	5.22
E. Germany	2.81	3.24	3.67	4.10	4.53
W. Germany	2.49	2.12	1.75	1.36	1.01
France	3.04	2.82	2.60	2.38	2.16
Greece	3.76	4.18	4.60	5.02	5.44
Italy	11.09	11.80	12.51	13.22	13.93
Libya	5.15	5.92	6.69	7.46	8.23
Palestine	4.00	4.24	4.48	4.72	4.96
Rumania	11.86	11.08	10.30	9.52	8.74
S. Arabia	9.16	9.66	10.16	10.66	11.16
Spain	1.88	2.06	2.24	2.42	2.60
Egypt	2.10	1.28	.46	-	-
Others	27.32	25.32	23.32	20.96	18.14

Source: Based on the secular trends for outward cargo presented in Appendix XII.

TABLE 27

PROJECTED INWARD CARGO CLASSIFIED ACCORDING  
TO MAJOR COUNTRIES OF ORIGIN  
( Tons )

	1967	1968	1969	1970	1971
U. S. A.	<u>255564</u>	<u>247487</u>	<u>259388</u>	<u>271534</u>	<u>284248</u>
Italy	244288	261907	279826	298324	317759
Rumania	214101	245144	277411	311145	346736
Britain	76427	78951	81384	85814	86339
France	94051	90667	86772	82474	77863
Belgium	96494	91208	85286	78839	71949
Holland	60898	59123	57043	54728	52237
W. Germany	56535	51733	46452	40759	34693
Greece	42750	49750	57043	64678	72738
Bulgaria	38737	44162	49796	55685	61896
Yugoslavia	60898	67234	73766	80561	87719
Australia	117258	126537	136011	145813	156120
Egypt	47462	39295	30472	21049	11039
USSR	20939	14961	8547	1722	-
Others	338514	334368	328880	322436	309874
Total	<u>1744916</u>	<u>1802527</u>	<u>1858077</u>	<u>1913561</u>	<u>1971210</u>
	=====	=====	=====	=====	=====

Source: Based on Tables 22 and 25

TABLE 28

PROJECTED OUTWARD CARGO CLASSIFIED  
ACCORDING TO MAJOR COUNTRIES OF

DESTINATION  
(Tons)

	1967	1968	1969	1970	1971
Britain	10385	9922	9434	8919	8379
Ceylon	36392	41291	46352	51575	56959
Cyprus	20159	21224	22314	23431	24573
E. Germany	12261	14416	16645	18948	21324
W. Germany	10865	9433	7937	6378	4754
France	13265	12548	11792	10999	10168
Greece	16407	18599	20863	23199	25006
Italy	48391	52504	56738	61095	65574
Libya	22472	26341	30342	34476	38742
Palestine	17454	18866	21319	21813	23349
Rumania	51751	49300	46715	43996	41142
S. Arabia	39970	42982	46080	49264	52534
Spain	8203	9166	10159	11184	12239
Egypt	9163	5695	2086	-	-
Others	119213	112662	105769	96865	85393
<b>Total</b>	<b>436351</b>	<b>444949</b>	<b>453545</b>	<b>462142</b>	<b>470738</b>
	=====	=====	=====	=====	=====

Source: Based on Tables 22 and 26

through the Port of Beirut. Tables 23 and 24 give the percentage distributions of the inward and outward cargoes for which secular trends have been derived (Appendix XI). Tables 25 and 26 shows the projected percentage distributions of the inward and outward cargoes respectively, and finally tables 27 and 28 present the projected distributions in tons of the inward and outward cargoes classified according to the major countries of origin and destination.

**C. Classification of Projected Demand  
According to Types of Commodities**

The cargoes that move through the Port of Beirut have been classified according to the following general types of commodities:

- 1- Construction Material
- 2- Flour and Cereals
- 3- Different Petroleum Products
- 4- Food Items and Beverages
- 5- Vegetables
- 6- Chemical Products
- 7- Cars, machinery, electrical equipment and accessories
- 8- Paper and Carton
- 9- Textiles, Cotton and other cloth material

TABLE 29

PROJECTED PERCENTAGE DISTRIBUTION OF THE  
PROJECTED INWARD CARGO CLASSIFIED ACCORDING  
TO TYPES OF COMMODITIES

	1	2	3	4	5	6	7	8	9	10
U.S.A.	2.33	71.99	1.15	2.31	-	2.20	6.49	1.34	1.85	-
Italy	32.18	.68	33.88	4.87	-	9.73	4.76	4.62	2.50	-
Rumania	40.33	38.70	-	11.08	.28	.70	.22	5.40	.08	-
Britain	17.64	-	2.85	9.22	-	25.77	18.62	2.49	3.47	-
France	43,49	1.42	6.89	11.12	-	10.08	8.36	.84	1.92	-
Belgium	53.65	3.25	2.55	7.25	-	16.31	5.19	.13	1.43	-
Holland	2.93	17.63	1.30	35.86	.08	25.05	5.90	.96	1.83	-
Germany	23.77	4.95	5.76	6.14	-	21.69	14.10	1.37	3.97	-
Greece	7.91	29.80	41.32	9.13	.32	1.30	2.05	3.56	.74	-
Bulgaria	64.85	8.99	-	16.48	-	3.52	2.44	.20	.24	-
Yugoslavia	32.16	.56	-	22.96	.43	8.43	5.70	16.32	1.67	-
Australia	13.98	84.31	-	1.36	-	-	.08	-	.07	-
Egypt	7.34	33.50	-	12.61	18.08	1.42	1.20	.09	7.77	9.44
USSR	82.08	.19	-	1.14	.07	5.16	1.30	.62	.26	-

TABLE 29 --(Continued)

	11	12	13	14	15	16	17
U.S.A.	-	-	6.72	-	-	1.56	2.06
Italy	-	-	-	.15	.42	2.19	4.02
Rumania	-	-	-	1.31	1.37	.45	.08
Britain	-	-	2.68	-	.54	4.26	12.46
France	-	.94	1.52	.67	2.65	3.05	7.05
Belgium	-	-	.97	.45	3.73	2.74	2.35
Holland	-	-	1.36	.14	.56	1.56	4.84
Germany	-	.04	.06	.08	.96	3.42	13.69
Greece	-	.05	-	-	-	3.35	.47
Bulgaria	-	-	-	.35	.91	1.88	.14
Yugoslavia	-	-	-	2.49	1.31	.05	3.44
Australia	-	-	-	-	-	5.67	.15
Egypt	-	.74	-	.18	-	5.69	1.96
USSR	-	.15	-	2.90	.13	-	.31

Source: Compiled by the writer and averaged for three years (1964, 65 and 66) from "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth," Trafic Maritime, Statistiques Diverses, 1964-66.



TABLE 30

PROJECTED PERCENTAGE DISTRIBUTION OF THE PROJECTED  
OUTWARD CARGO CLASSIFIED ACCORDING TO TYPES OF

## COMMODITIES

	1	2	3	4	5	6	7	8	9	10
Britain	18.26	.79	-	25.79	16.48	1.02	-	-	13.28	3.43
Ceylon	-	.68	-	20.61	77.04	-	-	-	.75	.92
Cyprus	24.97	33.59	5.58	2.33	3.07	1.37	1.22	-	.11	.77
E. Germany	-	1.70	-	1.05	18.12	-	-	-	-	77.91
France	.84	18.56	-	8.74	35.90	2.83	.19	-	5.96	1.11
Greece	3.07	11.13	-	37.68	18.16	5.34	1.45	-	2.51	1.24
Italy	5.41	23.00	-	5.86	7.76	.12	.62	.26	2.48	19.07
Libya	7.80	10.73	-	14.07	6.22	.58	.91	.17	.38	30.49
Palestine	15.25	.32	-	10.76	-	2.47	3.11	2.18	13.14	13.45
Rumania	-	.47	-	-	-	-	-	-	0.07	2.83
S. Arabia	37.65	8.66	-	25.57	3.28	1.50	2.92	.48	2.04	9.77
Spain	62.17	1.58	8.04	-	25.47	-	-	-	1.04	-
U.A.R.	1.48	.11	3.41	38.39	12.29	.09	4.56	.27	8.78	2.20
W. Germany	23.34	9.21	-	2.66	-	-	.24	-	1.21	-

TABLE 30 --(Continued)

	11	12	13	14	15	16	17
Britain	-	.30	-	.33	-	17.22	3.10
Ceylon	-	-	-	-	-	-	-
Cyprus	-	-	21.77	.19	.08	2.52	1.45
E. Germany	-	.49	-	-	-	.54	.19
France	-	2.15	.48	-	-	15.68	7.56
Greece	-	2.38	-	2.59	.25	10.04	4.16
Italy	11.00	16.61	5.12	-	-	1.40	1.29
Libya	-	-	23.04	1.43	-	2.24	1.94
Palestine	-	-	-	7.06	2.24	16.02	14.00
Rumania	96.43	.05	-	-	-	.11	.04
S. Arabia	-	-	1.69	.29	.70	1.37	4.08
Spain	-	.25	-	-	-	.85	.59
U.A.R.	-	-	-	1.29	-	16.79	10.34
W. Germany	-	1.44	55.11	-	-	3.92	2.87

Source: Compiled by the writer and arranged for three years (1964, 65 and 66) from "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth," Traffic Maritime, Statistiques Diverses, 1964-66.

- 10- Fruits, fresh and canned
- 11- Phosphate
- 12- Skin Products
- 13- Hay and food for animals
- 14- Wood products
- 15- Glass products
- 16- Other Merchandise
- 17- Other general cargo of less than five tons.

Tables 29 and 30, show the average percentage distribution for three years of the inward and outward cargoes classified according to the general types of commodities listed above. These figures are believed to give a fair presentation of the types of commodities that are related to the projected inward and outward cargoes through the Port of Beirut between 1967 and 1971

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The demand for shipping space in Lebanon is a function of the activity of the foreign trade sector, namely, the volume of imports, exports and transit trade. Hence, a demand analysis for the water transport service in Lebanon has required a scrutiny into the determinants of imports to, exports from and transit trade through the Port of Beirut. The determinants of demand related to imports have been hypothesized to be capital inflow, extension of credit, volume of tourism, population, prices of imports and income per capita. Of these, capital inflow to Lebanon has been found to be the most important factor in terms of its influence on and its contribution to the explanation of the demand for imports through the Port of Beirut. The volume of exports, on the other hand, is a function of the level of production on the local level, and the foreign demand for this production on the international level. For reasons already mentioned, a secular trend has been assumed to be appropriate in depicting the determinants of demand related

to exports. Similarly, for transit trade, trend analysis has been found to be the best tool to be used therefor given the time, information and scope of this study.

The analysis of overseas trade through the Port of Beirut, has enabled us to forecast the total inward and outward cargo movements through the Port of Beirut classified according to the major points of destination and origin as well as to the major types of commodities. The benefits that may be derived from this analysis and projections are twofold:

1- The responsible authorities in the Port of Beirut may highly benefit from the analysis that ultimately depicts the main factors that tend to a large extent determine the total cargo movement in the Port of Beirut. The projections arrived at from this analysis may be highly useful in finding whether the present plant facilities in the Port of Beirut can accommodate the projected movement of cargo in the Port. The responsible authorities are now undergoing the execution of a project driving at expanding the facilities in the Port of Beirut. It is highly recommended that a research complementing this study, be undertaken through the use of modern quantitative

techniques such as linear programming and queuing theory, to study the present plant facilities in the Port of Beirut in the light of the projected cargo movement therein, and to submit recommendations in this respect. In fact, it may be suggested that such a research be the topic of another thesis.

2- The analysis and projections in this study may be highly useful to the shipping owner companies and their agents that are operating in Beirut. The owner companies that are interested in a certain trade route connecting Lebanon with a series of other foreign countries, may highly benefit from the foregoing analysis and projections to determine the route pattern to be followed by its ships, whether liners or tramps. The sea freight market structure survey has shown that the agents operating in Beirut have the total cargo movement almost evenly distributed among them. These agents tend to derive the major part of their income from the outward cargo which they sponsor. Considering that this outward cargo is expected to increase between 1967 and 1971 by 34387 tons only, the Sea Freight market in Lebanon is expected to be a poor market during this period with no inducements for entry; hence its structure is not

expected to change during the period under consideration.

It should be pointed out however, that there are certain factors that tend to limit the effectiveness of the analysis and projections. These factors are mainly the following:

1- The analysis and projections have all the way through assumed linearity while in some cases curvilinear analysis would have been more appropriate. For example, in classifying the projected inward cargo according to points of origin, the percentage distributions have been assumed to have linear functions. (Table 23). It is obvious from the table referred to, that the U.S.A. distribution for inward cargo follows a curvilinear trend. Having assumed such a distribution to be characterized by linearity, pauses a limitation on the predictability power of the analysis.

2- Some factors which are believed to have a bearing on the demand for shipping space in Lebanon have been excluded from the mathematical model either because of their non-quantifiable nature or because data for same are not available. However, the probable affects of these factors have been

discussed in Chapter III.

3. There are certain unforeseen factors that may tend to influence the demand for shipping space in Lebanon, and that have not been possible to incorporate in the mathematical model. An example of these factors has been the June War of 1967, the probable effects of which have not been included in the model depicting demand for the water transport service in Lebanon.

4. Finally, the data that have been used in the analysis may not have the desired accuracy because in some cases they are partly the product of certain statistical manipulations and estimates. Yet, it is believed that the collected data have been highly useful to the type of analysis undertaken in this study, because as a trend, they are highly indicative of the growth rate of each of the variables incorporated in the analysis.



APPENDIX I  
 IMPORTS FROM AND EXPORTS TO SEA  
 COUNTRIES  
 ( Tons)

Year	Imports from Sea Countries	Total Imports	Exports to Sea Countries	Total Exports
1960	1132031	1258978	110678	417584
1961	1160665	1318256	89635	291684
1962	1062284	1402002	185951	422026
1963	1091696	1511748	269814	536841
1964	1202434	1588229	229154	501375
1965	1521761	1996829	251074	570497

Note: Imports of oil through pipelines from Iraq and Saudi Arabia are excluded.

Source: Computed by the writer from Recueil Statistiques Libanaises, vol. 2, 1965

APPENDIX II

CARGO MOVEMENTS IN BEIRUT INTERNATIONAL AIRPORT  
AND THE PORT OF BEIRUT

Year	Port of Beirut <sup>a</sup>		Beirut International Airport <sup>b</sup>	
	Cargo loaded (tons)	Cargo unloaded (tons)	Cargo loaded (tons)	cargo unloaded (tons)
1960	280484	1442575	15642	8128
1961	282233	1359125	16153	9640
1962	403267	1229236	17467	10673
1963	376557	1362717	18098	10407
1964	460463	1587916	16763	11050
1965	453310	1716934	19172	13628
1966	466391	1811026	-	-

Source: a - "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth", Traffic Maritime, Statistiques Diverses, 1960-1966

b - Ministry of Public Works, Directorate of Civil Aviation, Air Traffic Statistics, 1965.

APPENDIX III  
 WATERBORNE EXPORTS COMPARED WITH TOTAL  
 CARGO MOVEMENT IN THE PORT OF BEIRUT  
 ( Tons )

Year	(1) Exports	(2) Total Cargo Movement	( $\frac{1}{2}$ ) 100
1956	234627	1959774	11.97%
1957	271845	2018174	13.45
1958	156069	1428077	10.93
1959	133687	1664012	8.03
1960	107041	1723059	6.21
1961	142610	1641358	8.69
1962	236059	1632503	14.46
1963	202064	1739274	11.62
1964	229434	2048379	11.20
1965	294353	2170244	13.56
1966	271325	2277417	11.91

Source: "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth," Trafic Maritime, Statistiques Diverses, 1956-1966.

APPENDIX IV  
 VALUES OF IMPORTS TO AND EXPORTS FROM  
 LEBANON  
 (000 L.L.)

Year	Imports	Exports
1960	1,112,044	143,966
1961	1,271,995	155,623
1962	1,366,216	192,042
1963	1,314,188	196,321
1964	1,573,878	216,048
1965	1,683,546	324,056

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Source: Recueil de Statistiques Libanaises, Vol. 12, 1965

APPENDIX V

SUMMARY OF LEBANON'S BALANCE OF PAYMENTS

FOR 1961 - 1966

(000,000 L.L.)

	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>
<b>A. Current Account</b>					
1. Merchandise Trade	-812	-738	-856	-900	-1065
2. Non-monetary Gold	- 7	- 7	- 7	- 9	- 9
3. Foreign Travel and Tourism	+118	+126	+149	+136	+178
4. Transportation and Insurance	+122	+166	+160	+162	+178
5. Investment Income	+ 72	+ 68	+ 68	+ 74	+ 78
6. Gov't income not included elsewhere	+ 67	+ 66	+ 68	+ 83	+ 79
7. Miscellaneous services	+188	+189	+199	+198	+208
8. Donations	+120	+ 98	+109	+109	+108
Total Current Account	<u>-132</u>	<u>- 32</u>	<u>-110</u>	<u>-147</u>	<u>-245</u>
<b>B. Capital Account</b>					
9. Long-term	+ 62	+ 63	+ 57	+ 84	+ 79
10. Short-term	+104	+ 67	+ 58	+107	+146
11. Errors and Omissions	+ 53	+ 10	+ 42	+ 75	+ 47
Total Capital Account	<u>+219</u>	<u>+140</u>	<u>+157</u>	<u>+266</u>	<u>+262</u>
Total (A + B )	<u>+ 87</u>	<u>+108</u>	<u>+ 47</u>	<u>+119</u>	<u>+ 27</u>
	=====	=====	=====	=====	=====
<b>C. Balancing Items</b>					
12. Foreign Exchange	- 11	- 42	-	-	-
13. Monetary Gold	- 65	- 96	-	-119	- 27
14. Banking liabilities	- 11	-	- 47	-	-
Total (C)	<u>- 87</u>	<u>-108</u>	<u>- 47</u>	<u>-119</u>	<u>- 27</u>
	=====	=====	=====	=====	=====

APPENDIX V --(Continued)

Source: For 1961, Salem, Khalil, Lebanese Balance of for 1961,  
The Economic Research Institute, A.U.B., pp. 12 and 13

For 1962 and 63, Salem Khalil, Lebanese Balances of  
Payments for 1962 and 63, Economic Research Institute,  
A.U.B., pp. 10-11.

For 1964 and 65, Medawar, George, Lebanese Balances of  
Payments for 1964 and 65, Economic Research Institute,  
A.U.B., pp. 28-9.

APPENDIX VI

COMPUTATION OF THE WEIGHTED IMPORT PRICE INDEX

(1958 = 100)

Country	1956			1957			1959			1960			1961			1962			1963			1964			1965			1966		
	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index	Imports L.L.	%	Export Price Index
Spain	1933	.5900	57	1458	.3623	78	2904	.5840	83	5128	.5751	89	5783	.5350	86	8365	.7658	94	5412	.5352	98	8337	.6744	95	10024	.7690	102	10024	.7690	109
Sweden	5278	1.6111	103	6573	1.6332	104	9518	1.9139	95	18288	2.0509	98	12529	1.1591	102	10092	.9239	100	11793	1.1663	101	18526	1.4986	104	15332	1.1762	108	15332	1.1762	109
Germany	39741	12.1307	98	43967	10.8247	101	55948	11.2437	99	103444	11.6006	101	109548	10.1348	100	94229	8.6262	101	108824	10.7623	101	125620	10.1614	103	144315	11.0708	105	144315	11.0708	108
Iran	2734	.8345	109	2828	.7027	108	2511	.5049	96	4634	.5197	94	4288	.3967	94	4749	.4347	94	4937	.4883	95	4377	.3541	97	4701	.3606	98	4701	.3606	98
Italy	24102	7.3170	101	34381	8.5428	105	37884	7.6480	92	70434	7.8987	96	78608	7.2724	92	75317	6.8949	93	84488	8.3116	94	103716	8.3896	97	110348	8.4651	95	110348	8.4651	93
Brazil	3022	.9224	106	4305	1.0697	108	3357	.6250	85	4246	.4762	83	4419	.4088	85	3535	.3236	80	4332	.4284	83	4509	.3698	95	8336	.6395	98	8336	.6395	101
Britain	68483	20.9040	96	112467	27.9452	101	171255	34.4372	99	256805	28.7990	101	271655	25.1319	101	244039	22.9178	102	296313	29.3044	105	363512	29.4006	107	244915	18.7887	109	244915	18.7887	113
Belgium	20067	6.1253	104	18006	4.7470	107	15732	3.1635	96	31684	3.5531	98	36882	3.4121	97	34592	3.1667	96	39333	3.8899	96	39701	3.2144	98	36548	2.8037	98	36548	2.8037	101
Turkey	2569	.7812	79	2435	.6050	89	19669	3.9552	133	36196	4.0191	161	68373	6.3255	169	48560	4.4554	157	40548	4.0101	171	41736	3.3760	159	44021	3.3770	152	44021	3.3770	156
Switzerland	14024	4.2807	97	18532	4.6017	99	12862	2.5864	97	18622	2.0893	98	22409	2.0731	100	23892	2.1872	103	21320	2.1085	107	37194	3.0086	111	54577	4.1868	113	54577	4.1868	118
France	54528	16.6443	95	52315	13.9990	90	50966	10.2496	109	42018	10.3492	114	97822	9.0499	113	87790	8.1265	113	111760	11.0527	115	124039	10.0335	119	251657	19.3003	120	251657	19.3003	124
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	1404	.1299	97	944	.0864	106	1683	.1664	98	753	.0609	98	1188	.0911	108	1188	.0911	123
Canada	2425	.7402	101	2304	.5725	101	2726	.5482	102	3346	.3752	102	3272	.3027	103	5154	.4718	106	5763	.5699	107	4212	.3407	108	4339	.3329	110	4339	.3329	114
U. A. R.	10258	3.1312	93	12778	3.1250	101	12066	2.4263	100	16793	1.8832	100	17749	1.6420	102	13681	1.1925	101	17375	1.7183	100	19081	1.5435	105	19923	1.5284	113	19923	1.5284	122
Austria	6581	2.0089	102	6318	1.5699	102	7357	1.4794	98	11850	1.3289	100	14095	1.3040	100	10978	1.0050	94	12722	1.2582	92	13779	1.1146	94	17693	1.3573	97	17693	1.3573	95
India	1196	.3651	101	820	.2038	101	1547	.3111	100	1827	.2019	109	5204	.4814	111	2894	.2619	106	3996	.3952	106	3285	.2657	106	4420	.3391	112	4420	.3391	147
U. S. A.	63742	19.4169	97	72496	18.0134	100	75859	15.2543	100	125849	14.1131	101	222959	20.6269	103	264714	24.2333	102	125646	12.4260	102	209088	16.9132	103	181069	13.8903	106	181069	13.8903	107
Japan	2148	.6517	101	4846	1.2041	108	9708	1.9522	100	15936	1.7871	102	16869	1.5606	99	19685	1.8021	97	28807	2.8489	96	33984	2.7490	94	39963	3.0657	94	39963	3.0657	93
Yugoslavia	3784	1.1551	98	4354	1.0819	101	3702	.7444	97	4749	.5326	100	3394	.3140	99	3692	.3380	103	6298	.6228	105	5677	.4592	112	6660	.5109	119	6660	.5109	122
Greece	992	.3028	105	1272	.3161	102	1759	.3537	91	3496	.3920	89	3220	.2979	90	4994	.4522	92	4549	.4499	105	4415	.3571	104	5063	.3884	102	5063	.3884	104
Ceylon	-	-	-	-	-	-	-	-	-	2068	.2319	104	2559	.2367	95	2309	.2114	91	1937	.1916	93	2298	.1859	93	2661	.2041	94	2661	.2041	95
Argentina	-	-	-	-	-	-	-	-	-	7515	.8428	108	4294	.3973	107	1082	.0990	99	2697	.2667	108	2021	.1635	119	3467	.2660	119	3467	.2660	120
Luxembourg	-	-	-	-	-	-	-	-	-	7341	.8233	98	7008	.6486	97	5729	.5245	96	2145	.2121	96	1647	.1332	98	986	.0756	98	986	.0756	101
Portugal	-	-	-	-	-	-	-	-	-	2338	.2622	102	2442	.2259	103	2790	.2554	101	4246	.4199	105	2906	.2351	105	4687	.3596	106	4687	.3596	106
Denmark	-	-	-	-	-	-	-	-	-	9728	1.0909	101	10014	.9264	99	9635	.8820	101	11624	1.1496	103	12729	1.0296	106	15347	1.1773	107	15347	1.1773	111
Norway	-	-	-	-	-	-	-	-	-	1170	.1312	95	1810	.1674	97	1864	.1706	96	1890	.1869	95	2246	.1817	98	3219	.2469	103	3219	.2469	103
Ireland	-	-	-	-	-	-	-	-	-	646	.0724	102	835	.0772	101	1528	.1399	102	2312	.2286	104	2617	.217	110	1493	.1145	111	1493	.1145	113
Finland	-	-	-	-	-	-	-	-	-	6233	.6990	96	11238	1.0397	98	9986	.9142	96	9507	.9402	98	8317	.6728	104	6368	.4885	108	6368	.4885	107
Australia	-	-	-	-	-	-	-	-	-	4351	.4879	105	16320	1.5098	105	22639	2.0725	106	18962	1.8753	119	4571	.3697	122	32021	2.4564	113	32021	2.4564	118
Other Asia	-	-	-	-	-	-	-	-	-	8325	.9336	110	7044	.6517	106	6426	.5883	103	7072	.6994	104	10616	.8587	104	10164	.7797	108	10164	.7797	106
Other Africa	-	-	-	-	-	-	-	-	-	10909	1.2234	98	10867	1.0054	93	7347	.6726	90	8519	.8722	95	10397	.8410	98	11032	.8463	100	11032	.8463	105
Other Lat. Amer.	-	-	-	-	-	-	-	-	-	5747	.6445	94	6003	.5554	93	8746	.8007	91	4047	.4002	93	10338	.8362	101	7025	.5389	102	7025	.5389	105
	327607	100	-	402455	100	-	497300	100	-	898716	100	-	1080916	100	-	1092357	100	-	1011157	100	-	1236244	100	-	1303562	100	-	1303562	100	-

Weighted Import Price Index:

95.6221      99.9922      100.5680      103.9411      105.6070      103.8722      105.9687      106.9447      109.5827      112.4123

Source: - Distributions of imports are compiled and calculated by the writer from Retail Statistics Librarians, Vols. 1 & 2, Ministry of Planning, 1963 & 65.

a - Writer's own estimate.

- The Export Price Indexes are compiled from International Financial Statistics, 1957 - 1968.

APPENDIX VII

SUMMARY OF THE DATA COLLECTED FOR THE VARIABLES  
HYPOTHESIZED TO DETERMINE THE DEMAND FOR IMPORTS  
THROUGH THE PORT OF BEIRUT ( 1956 - 66 )

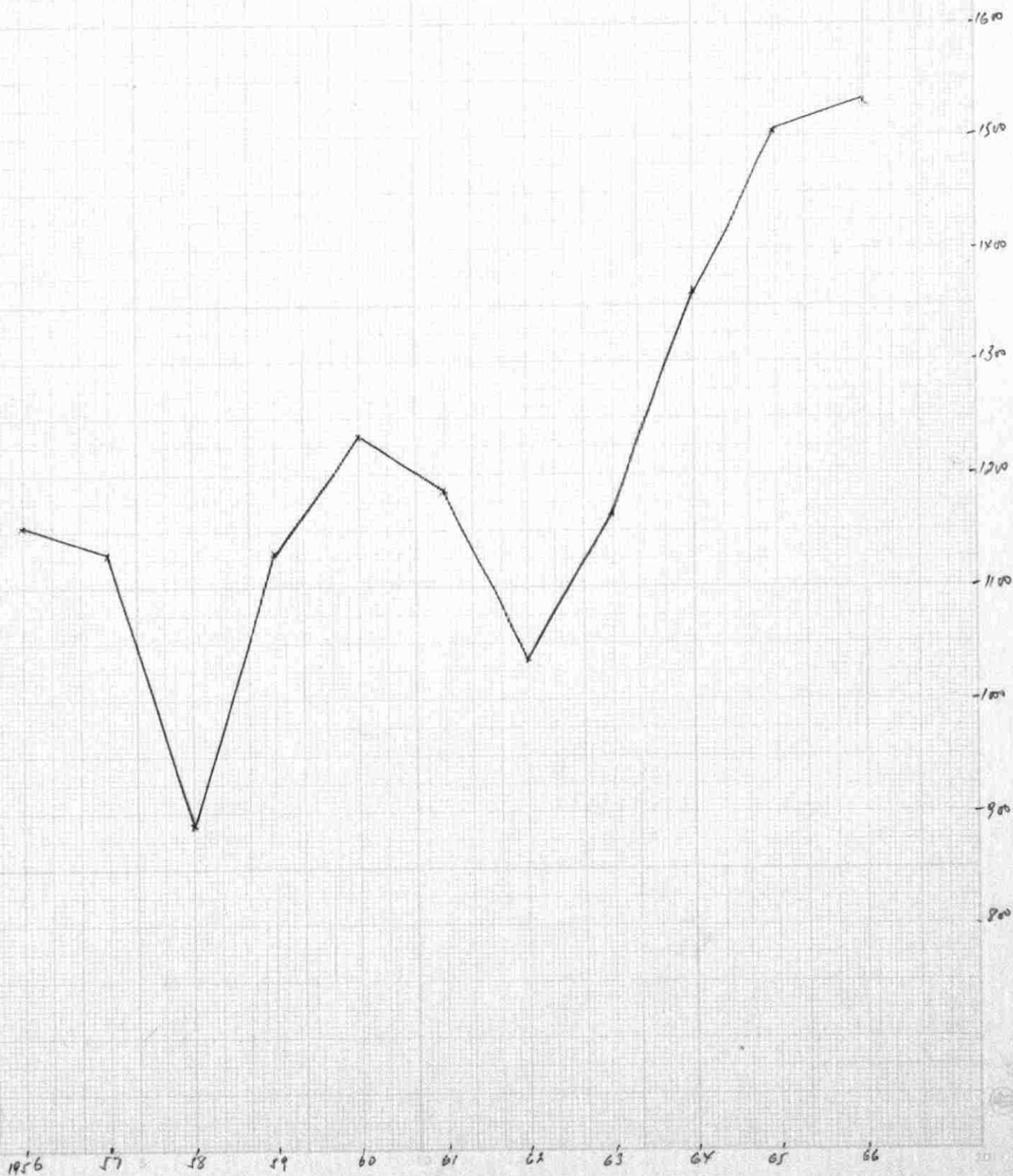
Year	Imports via Port of Beirut (tons)	Extension of Credit (000,000 L.L.)	Net Capital Inflow (000,000 L.L.)	Volume of Tourism
1956	1152582	427	170	859154
1957	1117279	485	190	549593
1958	889802	546	144	224045
1959	1133593	598	165	352884
1960*	1236131	882	258	533083
1961	1177776	1102	219	529361
1962	1033095	1134	140	625827
1963	1169598	1580	157	729883
1964	1358477	1951	266	963441
1965	1505456	2229	272	1220370
1966	1526718	2589	272	1513443
Standard Deviation	182046.3182	719.9139	51.3487	362516.4241



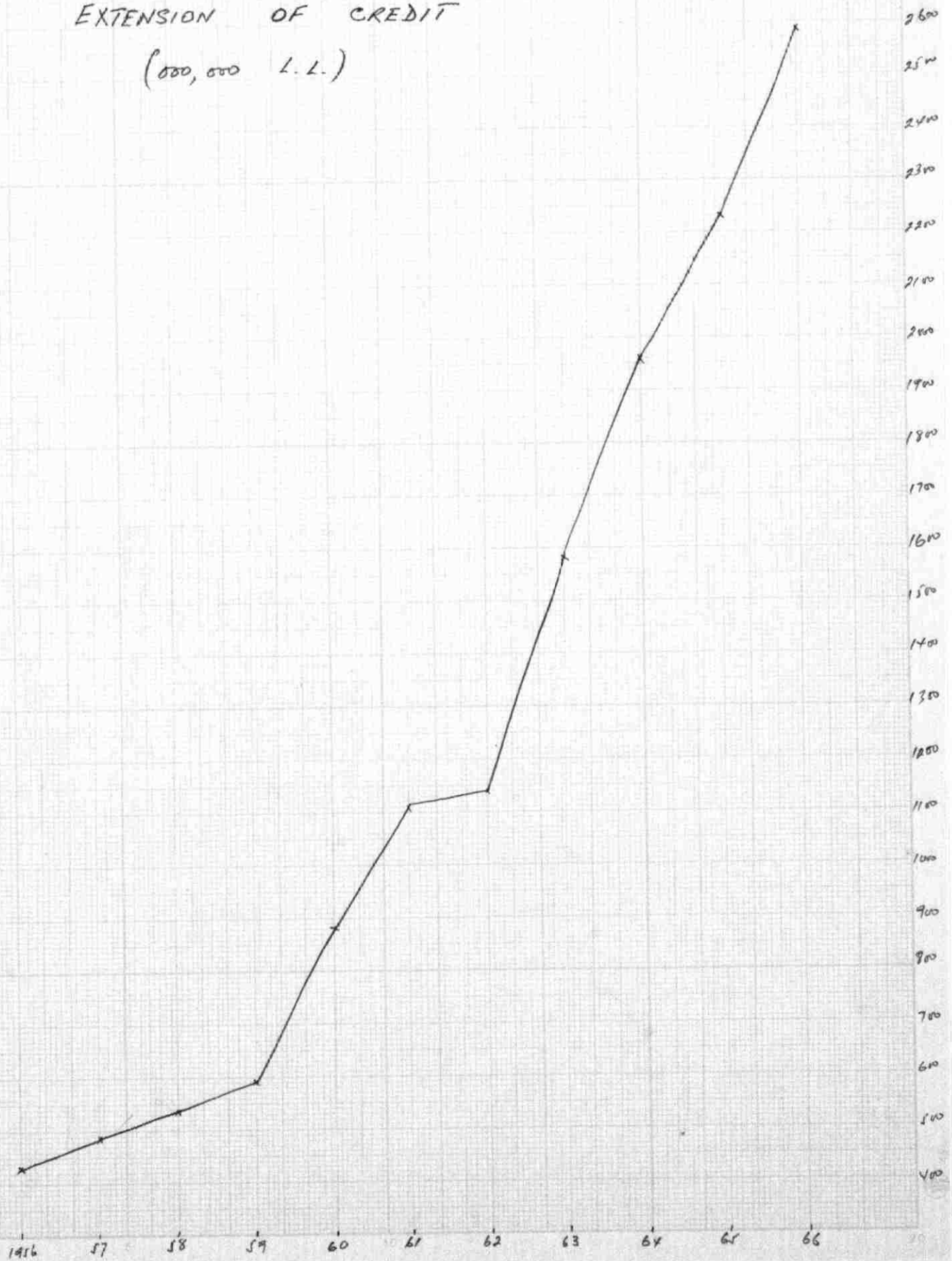
APPENDIX VII -- (Continued)

Year	Weighted Import Price Index (1958 = 100)	Population (000,000)	Income/Capita L.L.
1956	95.62	1900	1047.1
1957	99.99	1950	1082.1
1958	100.00	2000	930.2
1959	100.57	2055	1072.6
1960	103.94	2110	1111.9
1961	105.61	2165	1160.2
1962	103.87	2225	1184.4
1963	105.97	2285	1198.8
1964	106.94	2345	1220.2
1965	109.58	2405	1273.3
1966	112.41	2460	1306.4
Standard Deviation	4.5830	179.1820	103.9472

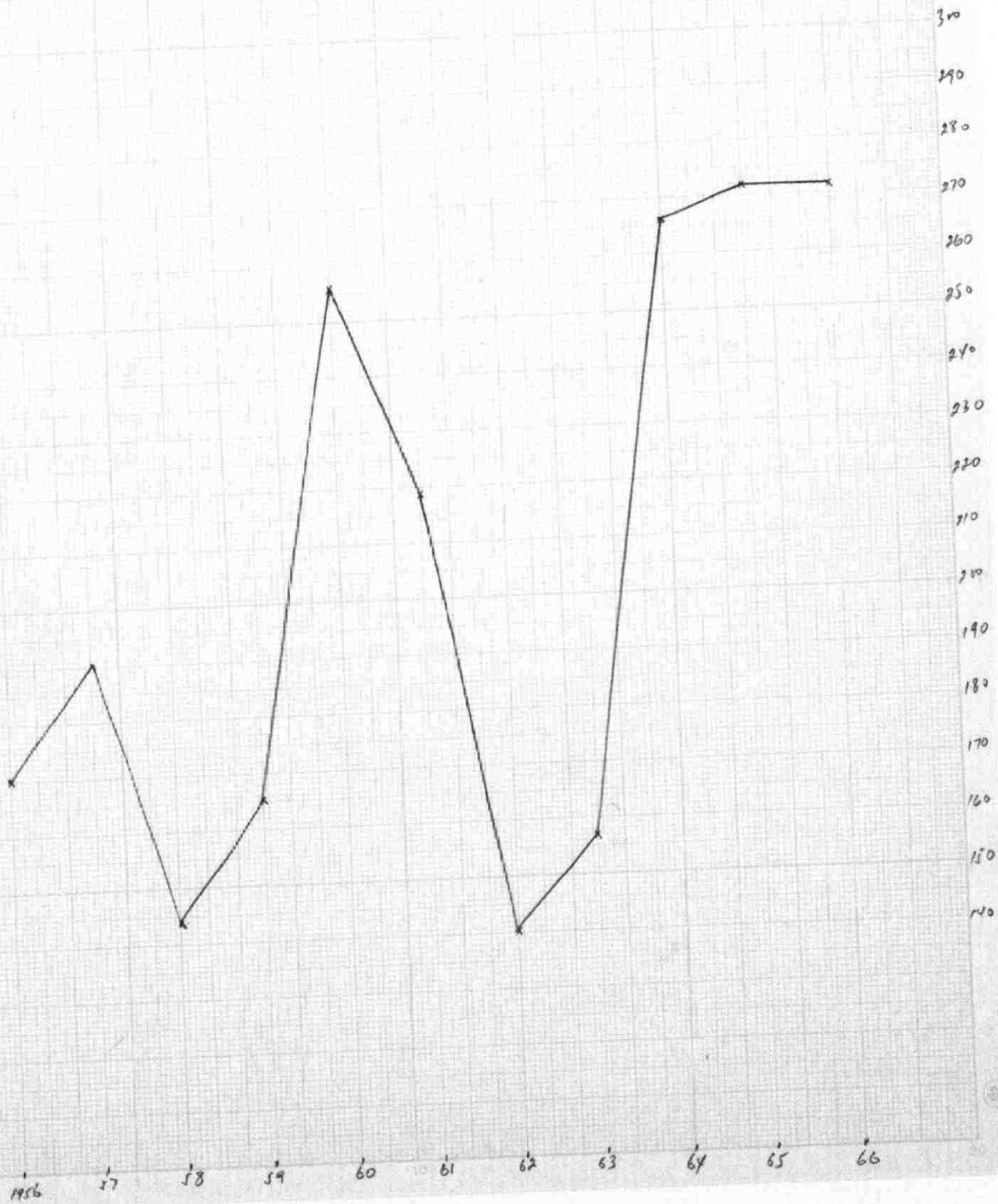
IMPORTS THROUGH THE  
PORT OF BEIRUT  
(1000 TONS)



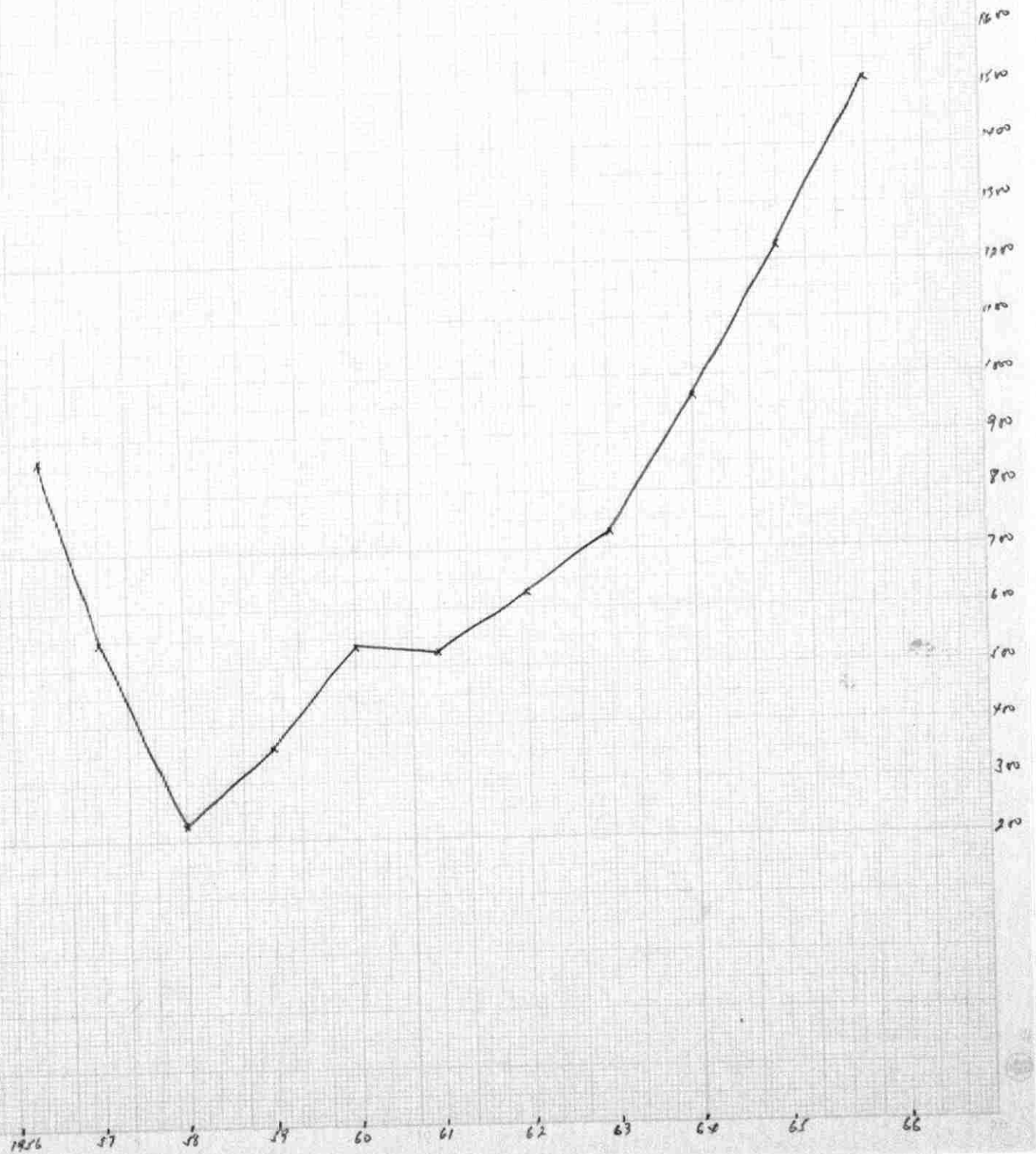
EXTENSION OF CREDIT  
(000,000 L.L.)



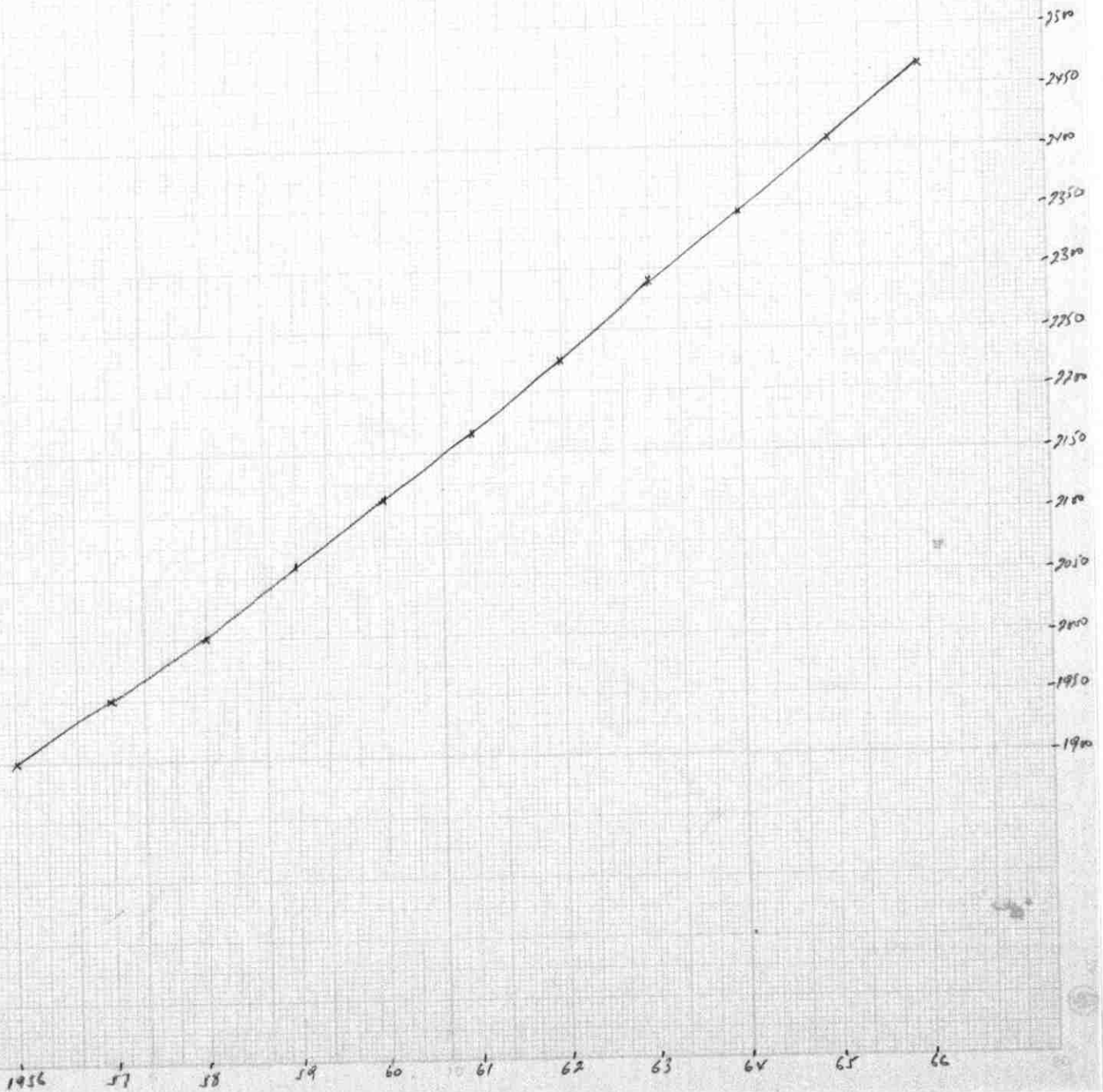
NET CAPITAL INFLOW  
(000,000 L.L.)



# VOLUME OF TOURISM (000 Tourists)



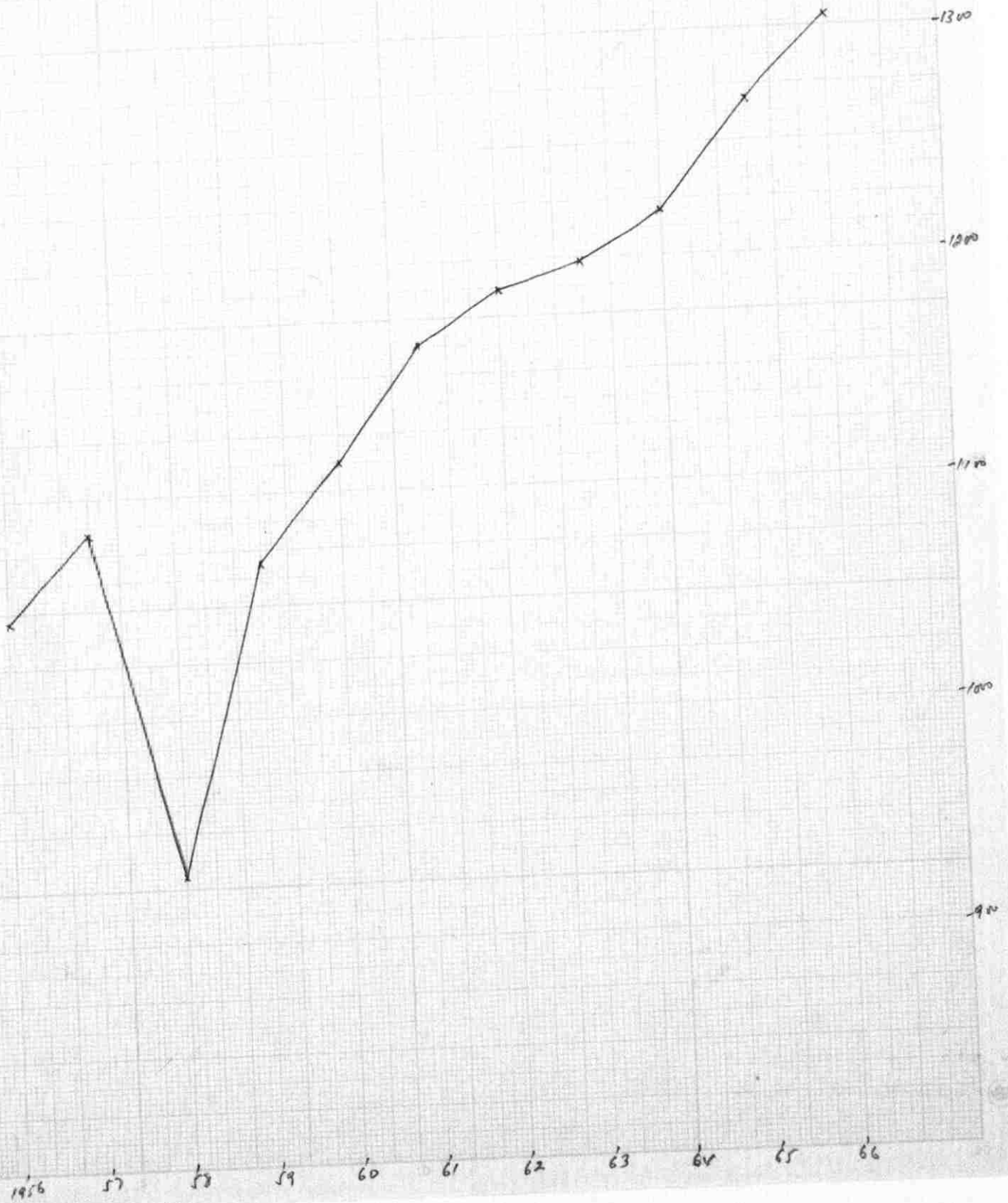
# POPULATION (000)



WEIGHTED IMPORT  
PRICE INDEX  
(1958 = 100)



# INCOME PER CAPITA L.L.





COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

1349086.347210      106.995256      1793.581841      .112174      -8739.948376      -265.512002      668.345075

SUM(YC-YBAR)SQUARE      SUM(Y-YBAR)SQUARE      DIFF(COL.2-1)      STD ERR OF EST-SQ      STD ERR OF EST      MULTIPLE R-SQUARE      MULTIPLE R

348547185761.218422      364549481914.000000      16002296152.781578      1454754195.707416      38141.240091      .956103      .977805

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

.9551797920      .8720321901      .9543524349      .9541355268      .9555840531      .9470527107

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

336887419.938559      30648302640.155859      638500039.046729      717573754.461367      189514254.167438      3299610702.252759

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.0206183753      .6569755465      .0383695606      .0429174245      .0117043276      .1709473953

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.1435910002      .8105402806      .1958814964      .2071652106      .1081865409      .4134578519

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

222.3396586128      390.7624229236      .1693200959      12444.2980351321      735.6276201355      443.7764073326

APPENDIX VIII

FORMULA OF THE STANDARD ERROR OF A NET  
REGRESSION COEFFICIENT

$$s_{b_{1.2.3.4\dots m}} = \sqrt{\frac{S^2_{1.2.3.4\dots m}}{ns^2_{2.3.4\dots m} (1-R^2_{2.3.4\dots m})}}$$

Where:

$S$  = Standard error of estimate

$n$  = Number of observations

$s_b$  = Standard error of estimate of the b's

$R$  = Coefficient of multiple correlation

$m$  = Number of variables

$s_x$  = Standard deviation

It is noticed from the above formula that the smaller the number of observations the larger the standard error of estimate of the net regression coefficient is expected to be.

## APPENDIX IX

## VOLUME OF TRANSIT TRADE THROUGH THE

## PORT OF BEIRUT

( tons )

Year	Sea-Land	Land-Sea	Sea-Sea	Transhipments	Total
1956	325779	168758	26273	12741	533551
1957	364468	178493	31959	11099	586019
1958	153397	121477	39269	14397	328540
1959	153795	145909	32074	16440	348218
1960	163763	130762	29005	13676	337206
1961	147682	105956	19300	14367	287305
1962	151496	122563	25802	18843	318704
1963	140360	121734	39736	13023	314853
1964	167647	169236	36144	25649	398676
1965	156108	103587	27336	28034	315065
1966	207421	118152	45485	31402	402460

Source: "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth, Traffic Maritime, Statistiques Diverses, 1956-66."

APPENDIX X  
 SYRIAN OVERSEAS TRADE THROUGH THE  
 PORT OF BEIRUT  
 (tons)

<u>Year</u>	<u>Cargo Loaded</u>	<u>Cargo Unloaded</u>	<u>Total</u>
1954	27150	144876	172026
1955	27694	213716	241410
1956	30197	138797	168994
1957	26306	140843	167149
1958	12354	67517	79871
1959	18061	77391	95452
1960	22571	43786	66357
1961	16597	41725	58322
1962	28545	53678	82223
1963	19270	40317	59587
1964	32330	33968	66298
1965	22119	27700	49819
1966	20717	27853	48570

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Source: "La Compagnie de Gestion et d'Exploitation du Port de Beyrouth", Trafic Maritime, Statistiques Diverses, 1956-66.

APPENDIX XI

PROJECTION OF THE SIX VARIABLES HYPOTHESIZED  
TO DETERMINE IMPORTS THROUGH THE PORT OF BEIRUT

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Credit	2550	2770	2990	3210	3431
Capital Inflow	266	276	285	294	304
Volume of Tourism	1503178	1657543	1811908	1966272	2120637
Import Prices	112.45	113.85	115.25	116.65	118.05
Population	2513	2569	2626	2683	2739
Income/Capita	1326.7	1356.7	1386.7	1416.6	1446.5

---

Source: Projected from the secular trends presented on pages 159 through 164

CREDIT  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

-91.563636            220.154545

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL. 2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
5331482.627272	5701036.545454	369553.918181	33595.810743	183.291600	.935177	.967045

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

5331482.627272

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.9351777671

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.9670458971

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

17.4761683817

NET CAPITAL INFLOW  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

153.722222                      9.366666

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
5264.066666	9382.222222	4118.155555	457.572839	21.390952	.561068	.749044

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

5264.066666

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.5610682141

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.7490448678

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

2.7615600648

*Note: Net capital inflow to Lebanon is characterized by wide fluctuations for the period under study. To eliminate the effect of these fluctuations, a three-year moving average has been derived & then the above secular trend was computed.*

TOURISTS  
 COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

113894.857142      154364.809523

SUM(YC-YBAR)SQUARE      SUM(Y-YBAR)SQUARE      DIFF(COL.2-1)      STD ERR OF EST-SQ      STD ERR OF EST      MULTIPLE R-SQUARE      MULTIPLE R

ER F8 .100079676561152384E+13

ER F8 .109149733525600000E+13

90700569644.476160      11337571205.559520      106478.031563      .916902      .957550

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

ER F8 .100079676561152387E+13

PARTIAL R-SQUARE(1,2,3...M).....R-SQUARE(M,1,2...M-1)

.9169026192

PARTIAL R(1,2,3...M).....R(M,1,2,...M-1)

.9575503220

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

16429.9169675607

*Note: The secular trend is derived from  
 nine observations where 1959 = 1. Years  
 1956, 57 & 58 have been omitted because  
 they constitute extreme years.*



POPULATION  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

1832.909090            56.636363

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
352844.545454	353168.181818	323.636363	29.421487	5.424157	.999083	.999541

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

352844.545454

PARTIAL R-SQUARE(1,2,3...M).....R-SQUARE(M,1,2...M-1)

.9990836197

PARTIAL R(1,2,3...M).....R(M,1,2,...M-1)

.9995417048

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.5171731519

IMPORT PRICE INDEX  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

95.653090                    1.398727

SUM(YC - YBAR) SQUARE	SUM(Y - YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
215.208178	231.048272	15.840094	1.440008	1.200003	.931442	.965112

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)  
0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)  
215.208178

PARTIAL R-SQUARE(1,2,3...M).....R-SQUARE(M,1,2...M-1)  
.9314424887

PARTIAL R(1,2,3...M).....R(M,1,2,...M-1)  
.9651126819

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)  
.1144158521

INCOME PER CAPITA  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

967.326700            29.947789

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
95883.564158	118855.429090	22971.864931	2088.351357	45.698483	.806724	.898178

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

95883.564158

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.8067243111

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.8981783292

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

4.4197170443

USA INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

Appendix XII

11.433928                    .228571

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
2.194285	123.221550	121.027264	15.128408	3.889525	.017807	.133445

MULTIPLE R-SQUARE (2,3,4,...M).....R-SQUARE (1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

2.194285

PARTIAL R-SQUARE (1,2,3,...M).....R-SQUARE (M,1,2,...M-1)

.0178076457

PARTIAL R (1,2,3,...M).....R (M,1,2,...M-1)

.1334452913

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.6001668029

ITY INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

9.234285                    .532380

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
11.904038	32.564800	20.660761	2.582595	1.607045	.365549	.604606

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

11.904038

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.3655492462

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.6046066872

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2479725041

RUM INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

.303214            1.331785

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
74.493433	107.560787	33.067353	4.133419	2.033081	.692570	.832208

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

74.493433

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.6925705515

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.8322082381

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.3137112410

BRT INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

4.385000            -.004999

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL. 2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
.001049	1.145550	1.144500	.143062	.378236	.000916	.030275

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

.001049

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.0009165902

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.0302752420

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.0583630876

FRN INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

8.629642            -0.356309

SUM(YC-YBAR)SQUARE	SUM(Y-YBAR)SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
5.332172	12.520787	7.188615	.898576	.947932	.425865	.652583

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

5.332172

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.4258655474

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.6525837474

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1462692343



BEL INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

9.762142            -0.473809

SUM(YC-YBAR)SQUARE	SUM(Y-YBAR)SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
9.428809	24.064800	14.635990	1.829498	1.352589	.391809	.625946

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

9.428809

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.3918091787

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.6259466260

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2087091168

HOL INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

5.376071            -.214404

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
1.930714	3.118687	1.187972	.148496	.385352	.619079	.786815

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

1.930714

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.6190793020

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.7868159264

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.0594611872

WGE INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

6.571071            -.370238

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
5.757202	7.493000	1.735797	.216974	.465805	.768344	.876552

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

5.757202

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.7683441052

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.8765523973

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.0718753389

GRE INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

-.337499                    .308333

SUM(YC-YBAR)SQUARE	SUM(Y-YBAR)SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
3.992916	8.377000	4.384083	.548010	.740277	.476652	.690400

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

3.992916

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.4766523417

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.6904001316

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1142272605

BUL INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

.149642                    .230357

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
2.228705	4.224187	1.995482	.249435	.499434	.527605	.726364

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

2.228705

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.5276056891

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.7263647081

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.0770644856

YUG INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A,B(1) TO B(M)

1.329285            .240714

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
2.433621	5.073550	2.639928	.329991	.574448	.479668	.692580

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

2.433621

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.4796683640

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.6925809440

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.0886393268

AUT INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A,B(1) TO B(M)

4.022500                    .295833

SUM(YC-YBAR)SQUARE	SUM(Y-YBAR)SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
3.675729	52.490187	48.814458	6.101807	2.470183	.070026	.264626

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

3.675729

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.0700269772

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.2646261084

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.3811576130

EGT INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

7.585000            -.542499

SUM(YC-YBAR)SQUARE	SUM(Y-YBAR)SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
12.360862	15.833787	3.472925	.434115	.658874	.780663	.883551

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

12.360862

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.7806636599

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.8835517301

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1016665446



USR INWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

4.530714            -.370714

SUM(YC-YBAR)SQUARE	SUM(Y-YBAR)SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
5.772021	13.645150	7.873128	.984141	.992038	.423009	.650391

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

5.772021

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.4230090126

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.6503914303

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1530749171

BRT OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

3.731071            -.148571

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
.927085	10.829550	9.902464	1.237808	1.112568	.085607	.292586

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

.927085

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.0856070394

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.2925868067

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1716730028

KEY OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

-.119999                    .939166

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
37.045429	53.056787	16.011358	2.001419	1.414715	.698222	.835596

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

37.045429

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.6982222428

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.8355969380

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2182953324

CYP OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A,B(1) TO B(M)

3.270357 .151309

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
.961572	10.293687	9.332115	1.166514	1.080052	.093413	.305636

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

.961572

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.0934137571

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.3056366422

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1666557925

EDGE OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

-1.060714                    .428214

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
7.701433	10.222987	2.521553	.315194	.561421	.753344	.867954

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

7.701433

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.7533447466

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.8679543459

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.0866292313

FRN OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

5.022857            -.215357

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF (COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
1.947905	28.726787	26.778882	3.347360	1.829579	.067807	.260399

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

1.947905

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.0678079773

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.2603996493

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2823102088

GRE OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

-.020714                    .415714

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
7.258371	26.316600	19.058228	2.382278	1.543463	.275809	.525175

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

7.258371

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.2758096193

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.5251757985

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2381615383

ITY OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

4.697142                    .708690

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
21.094172	32.089387	10.995215	1.374401	1.172348	.657356	.810775

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

21.094172

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.6573566424

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.8107753341

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1808973620



LIB OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

-1.781428                    .769761

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
24.886402	44.074150	19.187747	2.398468	1.548698	.564648	.751430

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

24.886402

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.5646484930

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.7514309636

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2389694367

PAL OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

1.836785                    .236547

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
2.350100	13.450487	11.100386	1.387548	1.177942	.174722	.417998

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

2.350100

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.1747223359

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.4179980094

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1817604626

RUM OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

18.878571            -.776904

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
25.350402	206.730350	181.379947	22.672493	4.761564	.122625	.350179

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

25.350402

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.1226254508

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.3501791696

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.7347253042

SAR OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

4.660357                    .504642

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
10.695905	27.062687	16.366782	2.045847	1.430331	.395227	.628670

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

10.695905

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.3952270208

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.6286708366

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2207049187

SPN OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

.258214                    .180119

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
1.362600	16.452687	15.090086	1.886260	1.373412	.082819	.287783

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

1.362600

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.0828193324

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.2877834818

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2119220916

EGT OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

9.482857            -.820357

SUM(YC-YBAR) SQUARE	SUM(Y-YBAR) SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
28.265405	56.270887	28.005482	3.500685	1.871011	.502309	.708738

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR) SQUARE DUE TO EXCLUSION OF X(1).....X(M)

28.265405

PARTIAL R-SQUARE(1,2,3,...M).....R-SQUARE(M,1,2,...M-1)

.5023095709

PARTIAL R(1,2,3,...M).....R(M,1,2,...M-1)

.7087380129

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.2887033931

WGE OUTWARD  
COEFFICIENTS OF SOLUTION VECTOR, A, B(1) TO B(M)

5.823571            -.367738

SUM(YC-YBAR)SQUARE	SUM(Y-YBAR)SQUARE	DIFF(COL.2-1)	STD ERR OF EST-SQ	STD ERR OF EST	MULTIPLE R-SQUARE	MULTIPLE R
5.679714	16.042487	10.362772	1.295346	1.138132	.354042	.595014

MULTIPLE R-SQUARE(2,3,4,...M).....R-SQUARE(1,2,3,...M-1)

0.0000000000

DECREASED SUM(YC-YBAR)SQUARE DUE TO EXCLUSION OF X(1).....X(M)

5.679714

PARTIAL R-SQUARE(1,2,3...M).....R-SQUARE(M,1,2...M-1)

.3540420325

PARTIAL R(1,2,3...M).....R(M,1,2...M-1)

.5950143128

STANDARD ERROR OF ESTIMATE OF B(1).....B(M)

.1756177245

## BIBLIOGRAPHY

### Books

- Bonavia, M.R. The Economics of Transport. Cambridge University Press, 1963.
- Christopher, John. Lebanon, Yesterday and Today. New York: Holt Rinehart and Winston Inc., 1966.
- Clement, M., Pfister, R., and Rothwell, K. Theoretical Issues in International Economics. Boston: Houghton Mifflin Co., 1967.
- Cufley, C.F.H. Ocean Freights and Chartering. London: Staples Press, 1962.
- Danial, Atef. Le Port de Lattaquié dans le Cadre de l'Economie Syrienne. Imprimerie Franco-Suisse, Ambilly-Annemasse, 1961.
- Eaton, R.J. The Elements of Transport. 2nd ed. London: Sir Isaac Pitman & Sons Ltd., 1963.
- Ellsworth, P.T. The International Economy. 3rd ed. New York: The MacMillan Co., 1964.
- Ezekiel and Fox. Methods of Correlation and Regression Analysis. New York: John Wiley & Sons Inc., 1967.
- Farmer, Richard. The Economics and Management of Transport Enterprise. Beirut: The American University of Beirut, 1957.
- Kindleberger, E.P. International Economics. 3rd ed. Illinois: Richard Irwin Inc., 1965.
- Marx, Daniel Jr. International Shipping Cartels. New Jersey: Princeton University Press, 1953.
- Klein, R.L. and Goldberger, S.A. An Econometric Model of the U.S.A., 1929-1952. Amsterdam: North Holland Publishing Co., 1955



- Medawar, George. Lebanese Balance of Payments for 1964-65.  
A.U.B. Economic Research Institute, 1967.
- Meir, Gerald. International Traded and Development. New York  
and Evanston: Harper & Row Publishers, 1963.
- Mission Irfed. Besoins et Possibilités de Developpement du Liban, Tome 1, Situation Economique et Sociale, 1960-64.
- O'loughlin, Carleen. The Economics of Sea Transport. Oxford:  
The Pergamon Press, 1967.
- Salem, Khalil, Lebanese Balance of Payments for 1961. A.U.B.  
Economic Research Institute, 1964.
- Salem, Khalil. Lebanese Balance of Payments for 1962-63. A.U.B.  
Economic Research Institute.
- Sturmey, S.G. British Shipping and World Competition. London:  
The Athlone Press, 1962.
- Svendsen, Arnljot. Sea Transport and Shipping Economics. Bremen:  
Institut Fur Schiffahrtforschung, 1958.
- Zimmerman, Erich. Ocean Shipping. New York: Prentice-Hall Inc.,  
1923.

Official Publications

- La Compagnie de Gestion et d'Exploitation du Port de Beyrouth.  
Trafic Maritime, Statistiques Diverses, 1956-66.
- International Financial Statistics, 1957-1968.
- National Council of Tourism in Lebanon, Statistical Sheets,  
1960-66.
- The Port of Aqaba. A booklet published by the Hashemite Kingdom  
of Jordan to commemorate the New York World's Fair of  
1964-65.

**Receuil Statistiques Libanaises, vol. 2, 1965**

**United Nations. Monthly Bulletins of Statistics, January 1968**

**United Nations Demographic Yearbook, 1966.**

### Reports

**Sturmev, S.G. A report on Ocean Freight Rates. An economic research submitted to the United Nations Conference on Trade and Development (UNCTAD), dated 5/5/66.**

**Shipping and the World Economy. A report of a Seminar on Shipping Economics held by the United Nations Conference on Trade and Development (UNCTAD), United Nations, 1966.**

### Other Sources

**Aqaba. A booklet published by Amin Kawar & Sons, Chartering & Shipping Agents, 1967.**

**Lissan-Ul-Hal Newspaper, 18th August, 1968**

**Al-Nahar Newspaper, Supplement, 18th August 1968.**

**Al-Nahar Newspaper, 18th August 1968.**

**Interview with Prof. George Medawar, A.U.B. on 16/7/68.**

**Interview with Mr. Paul Zahlan, General Manager of the National Shipping Co., on 8/7 and 23/7/68.**

**Interview with Mr. Pierre Masa'ad of the Bureau of Statistics in Lebanon, on 24/7/68.**