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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
INTERNATIONAL DEVELOPMENT ASSOCIATION

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THE ECONOMY

OF

KOREA

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This Report is based on the findings of a Mission which visited Korea in November and December of 1965. Because of technical delays the present Volume could not be circulated together with other volumes of the Report on the Economy of Korea. Notwithstanding developments since the end of 1965, the Mission believes that the assessments of long-term trends in the past and of the future prospects of Korean Industry could remain basically unchanged. The Mission was composed of the following members:

Ravi I. Gulhati.....	Chief
Cornelis J.A. Jansen	General Economist
Oktay Yenal.....	Money and Public Finance
Alexander G. Nowicki.....	Industry
M. Shafi Niaz (FAO).....	Agriculture
W.F. Doucet (FAO).....	Fisheries
Robert Ward (Arthur D. Little).....	Industry
Remedios Crofoot.....	Secretary

This Volume was prepared by Alexander G. Nowicki.

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## SECTORAL REPORT ON KOREAN MANUFACTURING INDUSTRY

### I. THE STATUS OF INDUSTRIALIZATION

1. The manufacturing sector led economic development in Korea throughout the last decade, with an increase in total production of 11% a year. The share of value-added in manufacturing in GNP rose from 13.6% to 16.8% during the period. (Tables 1 and 3). When compared to the industrial performance of other developing countries, Korea's achievement is impressive. (Table 2).

#### Investment Goods

2. The production of investment goods has been growing more rapidly than the manufacturing industry as a whole. This was due mostly to the creation of new, large import-substituting plants for cement and glass and to the rapid development of transport facilities requiring ship building yards, and factories for bicycles and motor parts. Government industrial policy is mainly responsible for the growth of the cement and shipbuilding industries through loans extended by the Korean Reconstruction Bank, and subsidies paid on the purchase of Korean made ships.

3. The iron and steel industry grew quite rapidly during the first half of the decade as a result of a considerable amount of earlier capital investment. The main raw material used was scrap iron. The supply of scrap metal has dwindled in recent years and this led to a reduction in the production of steel, although the demand for various steel products was increasing rapidly. The need has now arisen to consider alternative sources of supply, either of imported finished products or of domestic production from new plants.

4. The production of electrical machinery is still quite limited, but growing rapidly. Relatively simple items such as fans, radios, and small motors are produced domestically, but more complex items have to be imported. This is particularly true for industrial electrical machinery. The machinery industry has grown slowly. It is composed mostly of small and medium sized units, and the present domestic demand for machinery is in most cases too small for efficient production methods.

#### Intermediate Goods

5. The rate of growth of the intermediate goods industry is slower than that of the investment goods industry but higher than the average for the manufacturing industry. Import substitution is the main force behind this growth. In some branches this process has only started, but in others it has saturated the domestic market and has forced the manufacturers of the products in question to seek export outlets.

6. The chemical industry, shows the highest continuous rate of growth in this group. This is largely due to the creation of new, large fertilizer plants financed to a great extent from external aid. This has resulted in a reduction of fertilizer imports. The rest of the chemical industry consists of numerous specialized units, which can be grouped under the heading of medical-pharmaceutical preparations and basic industrial chemicals.

7. The growth of the paper industry has been quite rapid, deriving part of its stimulus from import substitution. In 1955, out of 24.5 thousand tons of newsprint paper consumed in Korea, 72% was supplied from imports, while in 1965, out of 48 thousand tons consumed, only 5% was imported.

8. The petroleum and coal products industries have also developed apace. The petroleum industry started in 1964 with the opening of a refinery in Ulsan. This refinery has caused a considerable change in the pattern of petroleum products imports, the emphasis now being on importing crude products (80%). In 1963, 97% of petroleum imports were refined products. The use of coal briquettes for heating and cooking has, in the cities, largely replaced rice and barley straw, and wood, as fuel. The annual rate of growth in the use of briquettes was about 20%.

9. Growth in the use of rubber products has slowed down due, mainly, to two factors: saturation of the domestic market, and reduced replacement demand due to better quality. Textile producers are also facing a fairly slow growth of domestic demand. In 1965 cotton manufacturers were operating at only 66% of capacity, with unsold stocks at the end of the year equalling one month's production. Both the rubber and textile industries relied on raw materials which were imported under U.S. foreign assistance programs, and were thus not subject to rigid quota restrictions which applied to other raw material imports. The relative ease of acquiring these inputs and the low rate of exchange led to considerable over-investment in rubber and cotton manufacturing.

10. The rapid rise in the export demand for plywood and veneer, especially in the U.S.A., has helped the growth of Korea's wood industry. The industry as a whole exported over 40% of its production in 1965, and plywood factories, operating at full capacity, exported 75% of their production.

#### Consumer Goods

11. The growth of consumer goods industries has been far below the average. Food constitutes about 52% of private consumption expenditures, and this share has remained relatively constant throughout the past ten years. The share of the consumer goods industry in total manufacturing production has decreased by one-sixth since 1960, as can be seen from Table 3. Part of this decrease can be attributed to the lack of scope for import substitution in consumer goods, as a considerable portion of demand is met from local production.

12. The relatively slow growth of consumer goods industries especially during the 1960's is illustrated by Table 4 which shows that the expansion of these industries proceeded at a slower rate than the growth of private consumption expenditures. By contrast, the local production of investment goods was considerably more rapid than the increase in gross domestic capital formation.

## II. CHANGES IN THE PATTERN OF OUTPUT

### International Perspective

13. To place the structure of Korean industry in an international context, a comparison is made in Table 5 between the actual structure of the Korean manufacturing industry and the "normal" pattern of the manufacturing industry, such as exists in countries of comparable population and income size and degree of industrialization.<sup>1/</sup> The comparison shows that food, wood, leather and basic metal industries are lagging behind the norm, while textile, paper, printing, chemical and rubber industries contribute more to the manufacturing sector in Korea than in comparable economies. The offsetting deviation from the norm of textiles on the one hand and clothing and footwear on the other may partly result from differences in industrial classification.

14. A further comparison of Korea's manufacturing structure with Taiwan and the Philippines (Table 6) shows that the share of textiles in manufacturing is greater in Korea than in Taiwan or the Philippines, while the share of food, beverages, tobacco, wood products and basic metals is less. These differences point to a certain lack of balance in the structure of the Korean manufacturing industry, resulting from the stress laid in the past upon the development of the textile industry which has no evident comparative advantage over several other industries, and from the insufficient development of especially the food industry and the basic metal industry (which could offer a number of inputs necessary for the engineering industry).

### Inter-industry Relations

15. The pattern of inter-industry relations in Korea, as derived from input-output tables, is quite different from the usual picture in developing economies. Intermediate demand in Korean manufacturing absorbs 47% of production, (Tables 7 and 8), while in most developing countries manufacturing output mostly consists of final products. The corresponding proportion for intermediate demand in India is nearly 50 percent, in Israel 46 percent, in Taiwan 32 percent, and in the Philippines 17%.

16. A comparison between the distribution of output in 1960 and 1963 shows that while intermediate demand of textile fabrics was 28.6% in 1960, it had risen to 35.9% in 1963. The same trend was evident for intermediate chemicals, whose share directed to further processing and industrial uses grew from 62.9% to 95.6%. Similar developments occurred in other important branches, with the notable exception of steel products, where a sizeable share has been diverted to exports to Viet Nam.

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<sup>1/</sup> This conclusion is based on a cross-section regression analysis of a sample of 53 countries (1953) and 42 countries (1958). The coefficient of the "relative degree of industrialization" for Korea in 1965 is 1.404. Regression equations have also been formulated for the distribution of value added among various manufacturing branches. See UN: A Study of Industrial Growth, 1963.

17. The degree of inter-industry dependence has great importance for the optimum location of industry. This was not always sufficiently taken into consideration in the past, with results such as the transportation of pig iron and iron ore around the whole Korean peninsula, from Samchok in the northeast to the mills in Inchon in the west, at a cost approximately equal to the transportation of iron ore from Australia. The same is true for petroleum products, where the freight from the refinery in the south (Ulsan) to the major consuming centers in the north is roughly equal to the freight of oil transported from the Arabian Sea to Ulsan. The question of inter-dependence and proper location becomes particularly urgent with the creation of new industries serving consumers spread over a wide area, such as a petrochemical complex or machinery industries. Errors in location could destroy many advantages these industries are supposed to bring.

#### Size Characteristics

18. In all three groups of industries a shift to larger manufacturing units has taken place. The rubber industry, which produces a rather small variety of products but in very large quantities (78 million rubber shoes, 430 thousand automobile tires) is composed mostly of large enterprises. At the other end of the scale the furniture industry, which is almost a handicraft industry in Korea, is characterized by a large number of small enterprises. (Table 9)

19. The problem of the optimum size of industrial enterprises is crucial in Korea, as in other economies. Among the recently created large enterprises, a glass factory, petroleum refinery, plywood factories and fertilizer plants appear all to be in the range of optimum size. Production of sheet glass is centralized in one enterprise. It has only three drawing machines per kiln (the usual modern factory has six drawing machines) but the installation of additional drawing machines in the near future appears likely. In the production of plywood, the size of a plywood mill is influenced by the availability of raw materials. Preferably, these should be of one species and be available in large volume. Economies of scale relate mainly to power and presses; only mills using large quantities of homogenous material and manufacturing standard products can profitably use mechanical equipment and some automation. Labor requirements per cubic metre of output depend upon the degree of mechanization, log sizes, average thickness of veneer used for patching and other factors. Another consideration influencing mill size is the possibility of exports. In the plywood producing countries of East Asia, average mill size has generally been large. It is generally considered that capacities greater than 8,900 m<sup>3</sup> (15 million sq. ft.)<sup>1/</sup> are needed if the mills are to engage profitably

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<sup>1/</sup> Information gathered from the 1963 Consultation on Plywood and Other Wood-based Panel Products (organized by FAO) indicates that in Japan, out of the 218 mills engaged in plywood manufacture in 1959, only about 70 were supplying overseas markets, and among these, about 40 large mills with capacities ranging from 8,000 to 20,000 m<sup>3</sup> a year (13.5 to 152 million sq. ft.) accounted for the bulk of exports.

in exports, so even the smaller Korean plywood units, one with a capacity of 80 million sq. ft. and another of 60 million sq. ft., together with 3 large mills having a capacity of 250 million square feet each, meet the optimum size for plywood factories.

20. The petroleum refinery is designed to process 35,000 BPSD of crude oil. While the share of gasoline in the product mix is small, the refinery is processing, in excess of this volume, about 39,000 BPSD. According to international standards this refinery is of average size,<sup>1/</sup> and investment costs are even slightly below the international level of capital expenditure for this size of refinery.

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<sup>1/</sup> See "A Modern Refinery" by C.H. Gamer in "Techniques of Petroleum Development" UN, New York, 1964, page 192.

### III. IMPORT SUBSTITUTION

21. Industrialization in Korea has been motivated for the most part by import substitution. Government industrial policy has taken the following forms:

- (i) Restrictive measures on imports (customs tariffs, import quotas, taxes).
- (ii) Promotional measures for local production (tax exemptions, preferential credit).

#### Restrictive Measures

22. Among the restrictive measures employed, quotas had more effect than import duties, as the latter were not high and the old official rate of exchange chronically over-valued the domestic currency. As shown in Table 10 traders and direct importers in the manufacturing sector received windfall profits resulting from the difference between the official and the true value of the 1963 won, and the fact that import duties were levied on the goods valued at the official exchange rate.

23. The exchange rate loophole was partially closed with the promulgation, in June 1964, of a special import duty, levied upon imported items, for which the rate of profits exceeds 30%. Furthermore the commodity tax (Table 11-B) has become instrumental in partially reducing gains in imports affecting in particular plastics and textile fabrics.

24. With the introduction in 1965 of a floating exchange rate, restrictive measures against imports of manufactured goods have changed considerably. Import quotas have been abolished except for 16 items which account for 17% of imports financed from foreign exchange earned through exports of Korean goods and services. There is however a long list of prohibited items. (Table 11-D) In addition to this, the import of investment goods is subject to government approval. The decision of the Government depends on the question whether the capital goods (a) are already being manufactured in Korea; (b) the price is in conformity with world market prices; and (c) the technology involved is not obsolete.

25. The economic rationale behind the screening of investment goods imports is not entirely clear. Generally, the authorities appear inclined to favor local suppliers. This may contribute to a virtual price and quality monopoly of local manufacturers. There is a widely expressed desire to reduce the level of Korean prices to the international level. A strong necessity is also felt to improve the quality of Korean manufactures, which is still low and which incites the majority of buyers of capital goods to look for the required products directly on the foreign market, without any attempt to examine the local possibilities first. A

too mechanical but restrictive screening of investment goods import may contribute to the unchecked rise in domestic prices for equipment and hamper any drive towards its better quality. On the other side, a complete liberalization of imports of equipment, especially considering that, principal installations for key industries are exempted from import duties and also that the tariff rate on general machinery is quite low (16.5%) may take away the entire potential market from the Korean producers of machinery.

26. The existing and very important list of prohibited imports plays a most decisive role of protecting practically all important branches of the Korean manufacturing industry. In particular the textile, chemical, and paper industries which have been pointed out before as principal import-substitution branches are heavily protected (Table 11-D). If the prohibitive barriers were entirely withdrawn without being replaced by a sufficiently high tariff wall, a considerable share of domestic demand would be diverted from locally produced goods to imported items, mostly because of their relatively lower prices and superior quality. There is no doubt that domestic industries generally would suffer severely from the competition and instead of increasing the efficiency of the industry, many firms may be forced out of business. However, substitution of a tariff structure, which could be gradually lowered, for the prohibited list would be desirable for the following reasons:

- (i) If the height of the tariff wall would correspond to the economically justified differences between the world market prices and Korean domestic prices, it should check any substantial price increases for domestically produced items in the future.
- (ii) The gradual lowering of the tariffs would give to local producers time necessary to develop better management, better quality, and to lower costs of production.
- (iii) Items entering Korea in spite of import duties would indicate that the corresponding domestic production is probably uneconomic.

#### Promotional Measures

27. Among the most important promotional measures in the field of import substitution are credit facilities. The banking system (which is either outright owned by the Government or Government controlled) has to adjust its credit-granting activity to certain priorities established by the authorities. The lists of priorities contain categories A (absolute priority), B (second priority) and C (third priority). The following import-substitution industries have been included into category A, during different periods:

	From August, 1955 onwards	From April, 1962 onwards	From March, 1964 onwards
Textile industry	A <u>1/</u>	C or B <u>2/</u>	A <u>1/</u>
Chemical industry	A <u>1/</u>	A or B mostly A	A
Basic metals	-	A	n.a.
Metal products	A	B	n.a..
Transport equipment	A	A	A
Food industry	A	C or B	n.a.
Machine industry	A	mostly B	A
Petroleum	n.a.	A	n.a.
Wood and cork	n.a.	B or C	A
Paper	n.a.	n.a.	A
Cement	n.a.	n.a.	A

1/ Excepting a few special fancy items.

2/ Except man-made fibre, included in A.

28. The proportion of loans received by import-substituting industries in the total of outstanding bank loans to the manufacturing sector has been considerable. Only three principal import-substituting industries account for half of total bank loans to manufacturing.

	1 9 6 4	
	% Share of the Total of Outstanding Loans	% Share in Total Output
Chemicals (mostly for fertilizers)	17.3	7.2
Clay, glass, stone (mostly for cement)	8.7	4.1
Textiles	22.8	27.8
	<u>48.8</u>	<u>39.1</u>

29. A further large amount of funds for investment in these industries has come from foreign loans. Credits received since the beginning of 1960 amount to:

	(in million \$)	
	1960-1965 (Sept.)	
	Public loans	Private loans
Fertilizer plants	48.8	43.9
Cement plants	4.1	17.6
Textile industry	3.1	52.5

(Excluding trade credits. Estimate of private loans is based upon the letters of credit opened at the Bank of Korea.)

30. Evidently, the orientation of the public industrial policy has been decisive to the development of import-substituting industries not only because priority loans have been extended to them by the Korean Reconstruction Bank, but also because they have received government guaranteed foreign loans in large measure.

31. The combined result of import restrictive measures (reflected mostly in import quotas) and import-substitution promoting measures (reflected mostly in credits) was most spectacular. The whole composition of imports of manufactures has changed. The market dependence on imports has fallen very sharply in the group of intermediate goods, while the dependence on imported investment goods remains still very considerable, and has even increased. (Table 12)

32. The reason for this recent increase in the dependence on investment goods imports lies in the rapid growth of investment. As calculated above, the growth of production of investment goods is only slightly quicker than the growth of investment, but as the structure of fixed capital is changing in Korea, however slowly, and the share of equipment in it is increasing  $\frac{1}{2}$ , import of investment goods and the dependence on it is necessarily growing.

33. The dependence on imported inputs has increased mostly in the investment goods sector. This is primarily due to the fact, that local supplies of metals have become insufficient. This is reflected in the approaching or existing shortages of copper for electrical machinery industry, because of a more limited possibility to recuperate copper from used army shells. Even more important is the depletion of post war reserves of scrap for metal industry. Also in iron and steel industry, shortages of flat products became quite acute and increased the dependence on imports.

1/ The share of machinery and transport equipment amounted to 32.7% in the fixed capital formation of 1960-61, and 34.3% in the fixed capital formation of 1963-65, all calculated in constant prices.

34. As the plywood industry becomes increasingly export oriented, reliance on imported Philippine wood also increases. Considering the difference between the equilibrium and the actual exchange rate, the dependence on imported inputs is actually about one-fourth higher than the figures for this and other industries would indicate.

35. The high dependence of the manufacturing industry on imported inputs renders the economy very vulnerable to any changes in world market prices, and in particular, to any changes in freight rates. Changes in the exchange rate are also directly felt by the producer, and any devaluation of the won is immediately transmitted to the market through increased prices of those products which have a high import content.

36. Many import substitution industries are operating profitably which may be accepted as a measure of their success. The problem of their real profitability (i.e. social marginal productivity) would become, however, less clear if additional economic factors are introduced here such as the low interest rates, which the newly created plants pay for Government-sponsored loans. There is considerable difference between the rates charged by Government Banks before and after the revision of the Bank's rates was introduced, as well as between the Government Banks' rates and the private usury market (curb market).

	<u>Organized</u> Old Rates	<u>Banking</u> <sup>1/</sup> New Rates	<u>Curb Market</u>
<u>Capital loans:</u>			
Under 2 years	10%	16%	
2 - 5 years	9%	11%	
Over 5 years	8%	10%	
<u>Operational loans:</u>	10%	18%	About 80% <sup>2/</sup>
Overdue charges on loans	1.46%	36.5%	

<sup>1/</sup> Since September 30, 1965.

<sup>2/</sup> Average.

37. The average effective interest rate paid by import substitution industries on loan capital obtained from the organized banking system in 1964 was:<sup>1/</sup>

Low interest:	Textiles	9.9%
	Wood and cork	5.3%
	Rubber	5.6%
	Chemicals	4.3%
Higher interest:	Glass & clay	16.0%
	Paper	15.4%

Other factors explaining the profitability of some import-substitution industries were (i) gains on imported inputs, imported at the actual exchange rate which until May 1964 was far below the equilibrium rate, and (ii) inflationary price increases, during almost the entire post-war era, which were bound to bring increases in profit rates as they were not accompanied by parallel wage increases. Korean prices for manufactured goods were insulated from the world market because of import prohibition and quotas.

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<sup>1/</sup> Table 26.

#### IV. EXPORT PROMOTION MEASURES

38. Although the export drive started in Korea later than the drive for import substitution, its results have been equally spectacular and the array of policy measures implemented to promote exports has been extensive. Korean exports of manufactures started from a modest \$4.5 million in 1960 (13.7% of total Korean exports of that year) and attained a level of \$107 million in 1965 (60.9% of Korean exports - Table 13). While total exports grew at a rate of 40% p.a., during the period 1960-65, exports of manufactures increased 24 times. This rapid growth of exports was encouraged by government policy, subsidies and other promotional measures but was also, though to a lesser extent, influenced by transient and accidental demand, created by extra-economic circumstances such as the war in Viet-Nam.

39. The Government's export-promoting policy consisted of tax exemptions, credit facilities and direct subsidies. Tax exemptions on exported products cover all the main taxes in Korea.

(i) Income taxes

A tax exemption from the corporate income tax is given for 50% of profits earned on exports. This exemption benefits, however, only the exporter. The same 50% exemption applies if the exporter is subject to individual, instead of corporate, income tax.

(ii) Other taxes

Business activities tax. Exporters are given complete exemption from the business activities tax on gross receipts derived from exports.

Commodity tax. Exemption from the commodity tax is given on goods which are exported. This exemption is particularly important for such commodities as cotton yarn, plywood and glass, which together accounted for 70% of total commodity tax exemptions in 1964.

(iii) Customs duties

Exemption from customs duties and special custom duties is given for imports, other than capital goods, used in the production of exports.

40. The most important credit incentives for exports are:

(i) Export loans

Credit in the form of 90-day loans (renewable to 135 days) at an interest rate of 6.5% p.a., <sup>1/</sup>up to an amount of

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<sup>1/</sup> Compare to 80% p.a. on short-term loans, obtained from private money-lenders in Korea, and to 26% p.a., representing the highest interest rate on loans extended by the banking system.

200 won for every dollar of net foreign exchange earned.

Export loans are given on the basis of a letter of credit, opened by the foreign importer. In case of non-fulfillment of export commitments a penalty rate of interest is imposed and in case of mala fide the exporter becomes ineligible for further preferential credit. The cost of the subsidy provided by the low interest rates on export credits is absorbed by the Bank of Korea.

(ii) Import usance credits

Import usance credits at 6% p.a. are given by the banking system to exporters for the goods (inputs) they import for processing in Korea.

41. Other subsidies granted exporters were discounts for railway transportation and electricity used in export production and direct export subsidies. The latter were mainly given to encourage the export of commodities for which the world market prices are below their domestic cost and commodities not exported before or sold in new foreign markets. The average direct subsidy in 1964 was 25 won per dollar, and was directed at such important exports as plywood, iron and steel plates, clothes, rubber tires and footwear, sheet glass and cotton sheeting, which among themselves accounted for 38% of total exports of manufactures. As, however, the difference between the official and the realistic exchange rate amounted at that time to about 48 won/dollar <sup>1/</sup> direct subsidies have been filling only a half of this difference. Exporters had an ample chance to make up for the remaining difference through fiscal exemptions and credit facilities, as well as export-import linkages. Out of the remaining 23 won/dollar difference in exchange rates (official - realistic) existing in 1964, exporters of manufactures <sup>2/</sup> were getting about 4.5 won/dollar gain on fiscal and credit facilities and also a sizeable gain on additional possibilities to import. Direct subsidies were abolished at the end of 1964. Another incentive was offered in the form of an export-import linking system, permitting the exporters to offset whatever losses might have resulted from exporting goods at the rate of exchange below equilibrium rate by allowing them imports at the official rate of heavily restricted items. This system was also discontinued at the end of 1964.

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1/ 255 won - 207 won = 48 won

2/ As calculated in Peggy B. Musgrave "Trade Targets and Policies in Korea's Economic Development", Seoul, August 1965, p. 53.

42. There are several reasons why Korean exports of manufactures although making spectacular progress can not be regarded as firmly established.

- (i) A thin margin of profitability, and sometimes a financial loss, in the export of different items. (para 128) Production is maintained by export subsidies, and justified by the authorities on the grounds that part of productive capacity will otherwise be idle. This seems to be the case in the textile industry, where the utilization of productive capacity has increased with the increase of the share of exports in its total output

	<u>1960</u>	<u>1963</u>	<u>1965</u>
% utilization of capacity <sup>1/</sup>			
Spinning (spindles) <sup>2/</sup>	87.8	87.4	89.9
Weaving (looms) <sup>3/</sup>	64.5	73.5	75.4
Share of exports <sup>1/</sup> in output (%)			
Spinning (yarn)	5.7	9.6	23.2
Weaving (cloth)	9.2	20.6	51.8

1/ Only cotton textiles.

2/ Established as relation between the number of spindles operating and the number of spindles installed.

3/ Ratio of looms operating to looms installed.

- (ii) The main comparative advantage of Korean production is the low level of wages which constitutes only two-thirds of the wage level in China (Taiwan) and one-fifth of the Japanese wages. (Table 15) However, Korean exports are on the whole not particularly labor-intensive. Imported inputs represent a sizeable share of the costs of production, amounting to 70% of the costs of production of plywood and veneer, 71% of rubber tires, but only approximately 30% of textiles (1965). The full benefits of low wages can moreover only be realized when applied in conjunction with optimum use of fixed capital. If Korea can be justly proud of its manpower, well-trained and well-educated, the uses it makes of its fixed capital are not so impressive. This is well illustrated by a comparison of the costs of production of plywood in Korea and in Japan. This shows that the wage-cost in relation to cost of logs in the Japanese plywood industry is only 40% higher than in Korea, whereas the wage differential in wood industries is more than triple, (9 cents per hour in Korea, as compared to 31 cents in Japan). This points to a very

considerable difference in productivity. Increase in productivity and better utilization of imported inputs may serve to eliminate losses (or increase profits) of Korean exports. 1/

- (iii) Some exports, such as those of galvanized iron sheets for Viet-Nam, are temporary and cannot be considered an integral part of Korea's export potential.
- (iv) The last factor which should be taken into consideration is quality of exported goods. In some cases, this quality is very satisfactory (like in exports of plywood). In other cases, it depends very much on raw materials used (as in the exports of cotton textiles). Still in others, the small size of producing units (sub-contracting plants, executing orders for exports of clothes) is apt to bring the quality downwards. And finally, very often, the low quality of exported goods is a result of neglect or of a lack of entrepreneurship (as in case of exports of ceramic wares and tiles).

43. The following factors would help to put Korean exports on a firmer footing:

- (i) Permanent contacts between Korean exporters and foreign markets. This has already been initiated by the Korean foreign trade center (Kotra) which establishes contacts abroad.
- (ii) A larger injection of technological knowledge from abroad. As Korea seems to wish to follow the Japanese path of development of exports, it is useful to recall that the initial steps of Japanese exports were facilitated by technically developed countries (USA, Germany, Great Britain). This is true in Korea only in the radio-exporting enterprises, which maintain contacts with technically advanced producers in Western Europe.

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1/ This necessity seems to be recognized by the plywood industry in Korea, which aims at a 20% decrease in production costs. This can be achieved both by a better utilization of raw materials, a decrease of the spread of adhesives, and by a higher productivity per worker. In the textile industry, economical use of imported inputs depends, to a large degree, upon maintenance of looms in a technically efficient condition.

- (iii) Attraction of foreign capital to profitable export ventures. This field is sometimes more attractive for foreign private capital than manufacturing for the domestic market. Although this kind of arrangement sometimes has a negative effect on the balance of payments through repatriation of profits, it brings with it sales outlets, technical know-how and investment funds. Foreign capital may profitably be used to export tiles, lacquer and glassware, clothing, silk products and processed food.

44. The major export market for Korean manufactured products is the United States, which takes 94% of exported plywood, 87% of footwear, 54% of clothing, 50% of sheet glass and 27% of cotton fabrics. (Table 14) So far Korea's share of total imports into the U.S. is very small, and as it increases, Korea can expect to face stiff competition from other more established exporters.

V. USES OF CAPITAL AND LABOR IN THE MANUFACTURING INDUSTRY

45. Due to the fact that prices of factors of production in Korea were not very high in the past, the use of factors by manufacturers has been often relatively wasteful. Machinery and equipment have been imported from abroad, duty-free (if destined for major industries).<sup>1/</sup> Moreover, funds necessary to import this equipment have been borrowed at a low rate of interest, and the won equivalent of their dollar value has been paid at the exchange rate below a "realistic" level. In the case of medium-term suppliers' credits which have become quantitatively important in recent years, the cost to the borrowers is kept low by government repayment guarantees which are given without charging a fee. Wages paid to the Korean industrial labor have not only been 50% lower than in China (Taiwan), (Table 15) and more than five times lower than in Japan, (which can be explained through differences in the respective levels of GNP in these countries and in Korea) but the increase in nominal wages during 1957-65 was largely offset by the rise in cost of living. Real wages have increased by only 1.4 p.a., in spite of substantial increases in the GNP and in the value added per worker.

46. According to official statistics (Table 17) the utilization of productive capacity in manufacturing has, on the whole, been quite low throughout the sixties, in spite of the impressive increase in industrial production. It is difficult, however, to decide how much significance should be attached to this statistical information. In various branches idle capacities are obsolete and inefficient and should really not have been included in the computation of total productive capacity. This is the case in the pig-iron making industry. It is also true for a large part of the textile weaving industry, where a large number of looms were installed a long time ago. Information about the age of machinery and plant is incomplete and it is therefore difficult to judge what part of industrial capacity is obsolete. There are however several instances of idle capacity where equipment has been installed in the recent past and where obsolescence is therefore less likely. Among these are the tire industry, flour milling and sugar refining. These are cases of misdirected investment (mostly before 1962) which went far beyond the capacity of the domestic market or any conceivable expansion of the export market.

47. Also, the measurement of installed capacity is bound to be quite imprecise. Firms have, in general, an interest in reporting accurately, because this facilitates exaggerated deductions for depreciation in computing taxable income. However, they may also fear that a higher declared value of

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<sup>1/</sup> In 1963, customs duties paid as a % of imports destined for the investment goods group of industries, and consisting mostly of items classified in groups 67-73 of the SITC code (Investment Goods), amounted to 6% only. This is the result of widespread exemptions; typically, tariff range between 15 and 33% on particular items.

capital would make it difficult to hide effectively the real volume of output and would lead, therefore, to a payment of higher taxes. A trade-off point between gains in terms of tax savings from depreciation allowances and gains through evasion of taxable income decides the exactitude of statistical information here. Notwithstanding these disclaimers about the value of the present statistical information, there is no doubt that under-utilization of capacity does present a problem in Korea. Recent efforts to assess more accurately the extent and causes of under-utilization may therefore prove highly beneficial in formulating policy.

48. In order to facilitate an assessment of the required future investment effort in Korea, the Mission presents two independent series of average capital-output ratios in branches of manufacturing. (Table 18 - A and B) The first series is based on a survey aimed at assessing the value of fixed capital, the second on the basis of statements of a purely financial nature. The first series, calculated for main industrial branches, contains a more detailed breakdown. It is interesting that the differences between the two series, are small although they are the result of different statistical investigations. The major exception is the food processing industry, where reliability is low, however, due to an abnormally low capacity utilization rate.

49. Capital-output ratios in the investment goods group are above the overall average, if we exclude non-ferrous metals. Reasons for the low capital-output ratio of the electrical machinery industry have been mentioned before - production concentrating on small appliances does not necessitate the use of costly equipment. In the group of intermediate goods, paper, fiber spinning, wood products, and intermediate chemicals (dyestuffs, inorganic chemicals, paints) have the highest coefficients. These comparisons are of importance as far as assessment of the future investment effort in Korea is concerned. The greatest development effort is expected to concentrate on branches which show the highest capital coefficients, such as synthetics (intermediate chemicals), steel products, machinery and transport equipment. Therefore, either the investment effort will have to increase considerably, or future increases in industrial production are likely to be much less spectacular than during recent years.

50. The evolution of the capital coefficients in the years 1962-1964 shows already a steady increase. (Table 18-B) If the year 1964 (when increase of output was significantly lower, which could have influenced the capital-output ratio upwards) is disregarded, comparisons between 1963 and 1962 point to the fact that the increase of the coefficient took place almost exclusively within the investment goods industries, wood and cork and textiles.<sup>1/</sup> Nevertheless, this increase has been sufficient to raise the total ratio for manufacturing quite considerably.

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<sup>1/</sup> Other industries where the capital-output ratio has increased, namely leather, play an insignificant role in the total. Increase of the ratio in rubber and petroleum industries is very marginal. It becomes important for petroleum in 1964, when the oil refinery was completed.

51. The share of investment which went into the manufacturing sector was higher than the contribution of this sector to the GNP in Korea.<sup>1/</sup> This can be considered more or less normal at this stage of development, and similar relations can be established for the Philippines and for China (Taiwan). (Table 19)

52. A more detailed comparison between the structure of manufacturing sectors in these three countries (Table 5) point also to the following differences in the productivity of capital and labor:<sup>2/</sup>

- (i) In general, in all three countries, food processing industries are more productive than the manufacturing industry as a whole. Nonetheless, while they are only 25% above the average in the Philippines and 68% in China (Taiwan), they are more than 100% above the average in Korea.
- (ii) The inverse relation is true for the next largest branch - textiles. Its productivity lags behind the average industry as a whole by 46% in Taiwan, 36% in Korea and 23% in the Philippines.
- (iii) The increase in the relative productivity of the chemical industry in Korea, from below the average for all manufacturing to above the average, is due to the creation of an oil refinery and fertilizer plants. This has brought the comparative productivity of this branch much nearer the respective levels in the Philippines and Taiwan, but there still remains a notable difference between the latter two countries and Korea.

53. Roughly speaking industrial development in Korea has, in the past, been achieved by the increase of production through the creation of new capacity or the extension of old facilities, rather than through a more efficient use of existing capacity. As mentioned before, the corollary has been idle capacity in a number of branches. It is the Mission's opinion that the forthcoming period of industrial development should follow, contrary to the previous one, an intensive pattern of industrialization where all existing possibilities to increase industrial production are exploited, without automatically resorting to increases in capital investment.

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<sup>1/</sup> Average for 1960-65.

<sup>2/</sup> In branches where the share of value added to the total value added is equal to the share of employment to total employment, productivity per worker is at the average level of the whole manufacturing industry. In branches where the share of value added is larger than the share of employment, the productivity is above the average and, inversely, if the share of value added is smaller than that of employment, productivity lags behind the average.

54. The main possibility for improvement is management. As explained above, cheap factors of production were not conducive to striving for good management. Furthermore, the economic chaos of an inflationary period did not permit long-term planning with any degree of certainty. Hopefully, those days are past, and no efforts should be spared to improve the management of enterprises.

55. Another possibility for increased efficiency lies in better organization of the relationships between enterprises. In certain branches considerable economies and a better quality could be achieved through standardization of products. This is particularly true for electric machinery, general machinery and metal product industries. A major effort in the field of industrial standardization may contribute to a reduction in types of products and should bring concentration of production. The creation of pilot plants or technological centers for such industries as ceramics should lead to more effective and modern methods of production which are lacking in this particular industry, and several others.

56. Labor productivity in the Korean manufacturing industry has increased by 4.2% per year during the five-year period 1960-65. <sup>1/</sup> This has been accompanied by increases of productive equipment per worker, which, calculated in horsepower per worker, has increased by 9.6% per year over the five-year period 1958-63. (Table 22)

57. In some industries such as paper, chemicals, textiles, wood and cork, electrical machinery, stone and glass, increases in capital intensity were accompanied by increases in labor productivity. In others such as transport equipment, machinery, metal products and basic metals, while equipment per worker has increased, labor productivity has diminished. The first group is composed mainly of industries producing intermediate goods, while the second consists predominantly of investment goods industries. Employment has increased in investment goods industries during 1960-64 (excepting metal products and stone and glass) faster than in intermediate goods industries (excepting chemicals). (Table 23)

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<sup>1/</sup> 1960-64 figures are given in Table 20. Estimate for 1960-65 is based on July 1965 data on employment. As data used in the computation were derived from various sources, (employment data from KRB Sample Surveys, value-added data from National Accounts) this calculation may not be absolutely precise. The growth rate of 4.2% per annum differs from that shown in Table 21 which uses employment data from the "Survey of the Economically Active Population". (EPB)

58. These differences may simply mean that industries which have a higher rate of growth (like investment goods industries) have hired additional manpower. But it can also imply that industrial growth in some areas was achieved through a better utilization of employed manpower, as in the case of intermediate goods industries, where the growth of production in 1960-1964 was often twice as rapid as the growth in employment, with a very insignificant increase in capital intensity.

59. The question of labor productivity is of course most important in the more labor-intensive branches of manufacturing. Table 24 shows the large degree of variation in labor intensity as between different branches. In such labor-intensive branches as transport equipment or machinery the share of wages in the total cost of production is twice as high as the average in all manufacturing. It is important to point out, however, that exactly in these branches labor productivity was at a rather low level.

60. Although the criterion of labor intensity should be taken into consideration in decisions regarding the future of industrial development of Korea, the increase of employment should certainly not be accepted as the sole or even most important criterion. If the future industrial development is divided into direct and induced development, it can be expected that main decisions as to the direct development may lead to only a small increase in employment.<sup>1/</sup> On the contrary, it is the induced development and all complementary capital investment it entails which brings usually an increase in employment. This is true for such branches as the petrochemical industry (where employment is normally rising in man-made fiber plants, plastic factories, and other enterprises induced through the creation of a main complex, whereas the production process of a basic product - ethylene, requires rather small manpower), the iron and steel industry (where employment is induced mostly in the adjacent metal products industry) and others.

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<sup>1/</sup> This has been often the case in the most recent past, whenever investments in modern technologies were made. For instance, the new oil refinery in Korea, constructed at the cost of \$20 million, employs less than 500 workers.

VI. FINANCING THE MANUFACTURING SECTOR

61. Financing the manufacturing sector in Korea is a key aspect of Government industrial policy. A general shortage of working capital and the role of Government-owned or controlled banks in industrial development add to the importance of this aspect of Government industrial policy.

62. In spite of the relatively advanced stage of industrialization attained in Korea, two main characteristics of the financing pattern are very much like those found in the industrial sector of more backward countries. These are the abnormally high ratio of working capital loans from banks and other sources compared to fixed capital loans or net worth and the very limited knowledge of the rate of profit and its distribution.

63. Out of the outstanding loans of Government Banks<sup>1/</sup> to the manufacturing industry in 1964, 34% only goes into the fixed capital investment, the remaining 66% is borrowed to supplement the working capital requirements. From whatever statistical information the Mission could put together, it appears that total net profits of the manufacturing sector could permit, if ploughed back, the financing of at least new fixed capital investment.

	<u>(Estimates of the Mission)</u>			<u>(billion won - current prices)<sup>2/</sup></u>		
	1963			1964		
	Net Profits	Depreciation Allowances	Gross fixed Investments	Net Profits	Depre- ciation Allow.	Gross fixed Investments
Whole manu- facturing Industry	18.7	n.a.	14.5	23.4	14.6	17.6

<sup>1/</sup> This wide classification labels the whole group of banks, encompassing the Korean Reconstruction Bank, Medium Industry Bank, and Commercial Banks.

<sup>2/</sup> Net rates of profits to value added have been obtained from sample survey, carried by the Research Department of the Bank of Korea (Analysis of Financial Statements of a Sample of 580 Enterprises, 1964, pp. 77 and 83) which covers about 20% of all enterprises. They have been applied to recent value added data, derived from National Accounts and computed for all branches of industry. There seemsto be no likelihood that they contain an upward bias -- the opposite may however be true which can only strengthen the above conclusions.

64. This has not, however, been the case. Internal sources of financing<sup>1/</sup> which include both retained profits and depreciation, provided only 13% of all finances necessary for the functioning of the manufacturing sector. (Tables 25-A and B)

65. This raises a question about the distribution of profits derived from industrial activities. At the present stage of information available it is impossible to trace this with any degree of confidence. All we can offer at this stage is the hypothesis that industrial profits have been a main source of real estate and inventory speculation. As the effective rates of interest paid by industrial entrepreneurs on borrowed funds were quite low<sup>2/</sup> it has been certainly much more profitable to borrow from the Banks, as much as it was possible, and invest the profits in other ventures. These, in the years of inflation and speculative demand, were more attractive in the fields of real estate or commerce than in industry. Only part of the profits was therefore plowed back. A further possibility is that part of net earned profits could have left the industrial enterprises in Korea through the back door, for reasons of tax evasions, and come back through the main entrance. This accounts mostly for development financing through stocks. Korea has a very limited stock market and it certainly could not have contributed to this source of financing, which as the data shows (Table 25) accounts for a half of total external financing. The sources of stock financing should therefore be looked for elsewhere. Although the dominant majority of Korean industrial enterprises is family-owned and family-run, there is general preference for registration as corporate enterprises. Financing through stocks, however, usually does not pass through the stock exchange, but, more often than not, represents funds put back into the enterprise by friends or relatives. Thus, ostensible financing through stocks are in reality funds put back into the enterprise by friends or relatives. It is possible that the recent increases in interest rates may have curtailed these activities to some extent.

66. Borrowing of working capital from the organized banking sector was especially heavy in industries using large material inputs: textiles, rubber, paper, wood and cork. (Table 27) Short term borrowing, from all sources, accounts for about 25% of all financial resources in these industries. This would have been normal if it were not for the fact that some of the industries borrowing these funds were making large profits on the import of materials due to the undervalued exchange rate, and therefore could have ploughed these profits back into business.

1/ Calculated from "Sources of Funds Statements" prepared by BOK.

2/ In industrial enterprises financed by the KRB and representing 42% of the total output, the effectively paid rate of interest on the total loaned capital has been only 10.2% in 1964. (Table 26) This is confirmed in the Bank of Korea analysis (Op. cit. p. 71) where this rate for all enterprises is given as 8.5% in the same year.

67. The orientation of Government bank loans reflected the Government's emphasis on import-substitution industries. The chemical industry received almost 20% of all loans, the largest share of this being absorbed by investments in fertilizer plants. An even higher percentage of bank loans went into the textile industry.

68. The share of investment goods industries in bank loans was generally higher than their respective shares in total sales.

Table 27 points out some interesting facts regarding profits:

- (i) The basic metals industry enjoys a percentage share in total profits which is double its share in total sales. As this industry is not particularly profitable, the explanation lies in the small depreciation charges it is allowed to make.<sup>1/</sup>
- (ii) Profits in the chemical industry are falling because of the financially unsound condition of two main Government-owned fertilizer plants, the deficits of which have been growing since 1964. Price adjustments since then may have led to an improvement in the situation.
- (iii) The share of profits of the petroleum and coal products industries was abnormally low in 1963. At that time this industry consisted mostly of producers of coal briquets. While the price of briquets is controlled, it was permitted to rise by 9% in 1963. It is true that prices of coal were not increased at this time, but in the presence of a general inflation net profits of this industry as a whole, were low. Profits of the industry increased considerably, however, since the oil refinery started operations in 1964.

69. The Korean Reconstruction Bank has been responsible for the lion's share of development financing in Korea. The KRB was established in April 1954, as a national development bank, succeeding the Industrial Bank of Korea, which had been in existence since 1918. The original law establishing KRB, dated December 20, 1955, was amended on December 27, 1961 (Law No. 873). Article 1 of this law states: "The primary purpose of the Korean Reconstruction Bank shall be to supply and administer funds, in conformity with the Government's policies, for financing necessary industrial projects in order to expedite industrial rehabilitation and economic development of the nation." KRB's main function is the granting of investment (capital) loans to industrial enterprises, both government and private. Operational (working capital) loans are authorized only to

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<sup>1/</sup> Until December, 1965 -- only 6% per year on the basis of decreasing value of equipment. This has been recently (as of January 1, 1966) raised by over 2 times, which will bring redistribution between profits and depreciation.

recipients of capital loans and to government-owned enterprises. The underwriting of stocks and bonds authorized in 1961 is not yet significant. The issuance of guarantees has become an important function since KRB assumed won guarantees containing a maintenance of value clause in favor of the Bank of Korea, as backing for dollar guarantees this bank assumes in favor of foreign creditors. 1/ Furthermore, the KRB acts as the agent for "Cooley" loans, extends subloans under DLF Loan No. 94 (now AID Loan No. 489-A-007), and administers the utilization of won proceeds resulting from development loans repayable in dollars. The KRB also administers housing loans.

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1/ The KRB Act authorized the bank "to guarantee the BOK as to the reimbursement in local currency for foreign credit when the BOK has guaranteed the repayment of the credit in foreign exchange". Ninety-nine percent of all guarantees written by the KRB fall in this category.

Guarantees now constitute by far the biggest single item in the balance sheet; they comprise more than 50% of all assets and liabilities, while they were a minor item up to 1962. As the influx of foreign loans became significant, guarantees increased rapidly amounting to 36% of assets and liabilities by the end of 1963. Since guarantees carry a maintenance of value clause, the adjustment of the Won/Dollar rate in May, 1964, nearly doubled the amount outstanding.

The claims of the KRB against the recipients of the foreign loans are backed by collateral and by a re-guarantee of the Government, in case the collateral is not sufficient. Furthermore, repayments of existing loans and profits will probably exceed in any given period the recourse on the KRB the BOK is likely to take. If this assumption is correct, the guarantee commitments while impairing the availability of funds to carry out the loan program, will probably not impair the bank's liquidity and will not endanger its capital and reserves.

In the total of KRB's guarantees on the repayments of foreign loans amounting to won 40,915 million, fisheries is the biggest category with 31%, followed by textiles with 24%. Korea Marine Development Corporation, a Government-owned corporation, is by far the biggest account in the fishing industry. All together, three government-controlled enterprises compose 46% of the outstanding guarantees.

70. The relative importance of these functions of the KRB is shown in the table below:

<u>KRB Loans, Guarantees and Investments</u> (in million of won)				
	<u>12/31/62</u>	<u>12/31/63</u>	<u>12/31/64</u>	<u>6/30/65</u>
Capital Loans	20,765	23,584	26,051	26,818
of which, Housing Loans	(2,595)	(2,966)	(3,168)	(3,131)
Cooley Loans	(65)	(71)	(51)	(56)
DLF Subloans <sup>1/</sup>	(17)	(66)	(125)	(166)
Working Capital Loans	3,558	4,037	5,679	6,143
Guarantees	2,211	18,136	38,338	40,915

<sup>1/</sup> On disbursement basis, which differs substantially from the loan approval basis.

71. Interest rates charged by the KRB are shown in Table 28.

72. In according preference to one group of industrial borrowers as opposed to another, KRB is guided by a priority list of loans, where industries are grouped in categories according to the importance the Government attaches to their development. This system of priorities, and the influence exerted by different Government agencies on the KRB, have determined the specific pattern of loans. Often the largest share of bank loans has been channeled to industries showing very low rates of return. This is particularly apparent for industries such as transport equipment, fertilizers or textiles. The share of these three industries in the total output for the manufacturing industry is 37.2%, the share of profits however only 26.4%, and the share of outstanding bank loans 44.5%. Within the transport industry, loans extended to the Korea Shipbuilding Corporation account for 30%, and in the chemical (including fertilizers) industry, loans extended to two Government-owned fertilizer plants account for 86% of loans granted to these branches. (Table 29)

73. Out of the total loans extended by the KRB to the manufacturing sector (outstanding as of June 30, 1965) 24% are granted to Government-owned enterprises and 76% to private enterprises. The share of Government-owned enterprises in the total output of industry is much less than its share in credits received.

VII. OUTLINE OF THE FUTURE DEVELOPMENT OF THE  
MANUFACTURING SECTOR

74. At the time of the Mission's stay in Korea, there was no sectoral breakdown of the draft macroeconomic model for the Second Five Year Plan and no development plan for the manufacturing sector was in existence. Production and investment concepts, put together by the Ministry of Commerce and Industry (MCI), were based mostly upon the thinking of professional and regional organizations such as associations of manufacturers and chambers of commerce. The analysis which follows is based upon whatever development intentions and projections could be obtained, as well as on information collected at the branch level of industry. Mission's projections are outlined in Table 30.

A. Development of Investment Goods Industries

75. Transport equipment. This industry consists of two main branches: motor vehicles and shipbuilding. The existing stock of means of transportation is relatively small and faces a rapidly growing demand. Development plans in this industry are not very clear. The first version of the plan, drafted by the MCI, aimed at a rather modest increase of production of motor vehicle parts, and a rapid increase of the tonnage of ships produced in Korea. A large planned expansion of shipbuilding is based mainly upon three assumptions: (i) That a large part of the rapidly growing bulk of Korean exports shall be carried in domestically built ships, (ii) That the future expansion of fisheries will require sizeable fleet of locally-built fishing boats, and (iii) That steel plates used for construction of shells and now imported from abroad will be locally produced. According to the estimates of Korean planners, additional capacity of ships required during the Second Plan will amount to 587 thousand GT, and this production goal has been set before the shipbuilding industry. Investment in shipbuilding would aim at a tripling of present capacity,<sup>1/</sup> which incidentally is utilized at present only to the degree of 30%. Shipbuilding in Korea is still unprofitable. Sixty percent of the cost of production consists of imported materials and the Government has to subsidize up to 30% of the sale price to bring it down to the level of Japanese prices for ships.<sup>2/</sup> Even if the hypothesis of domestic production of thick steel plates (over 3.75 mm) is accepted as valid, it cannot be expected that their cost will be below the import price. Although the presently under-utilized productive capacity will be better utilized at the planned increased production, economies of scale do not play a major role in shipbuilding (the share of overhead and depreciation in total costs is only 16.7%) and the industry may suffer considerable losses. Moreover, the construction of 300-700 hp marine engines and ships exceeding 13,000 GT, requires specific skills and experience which presently may not be available in Korea. It is, therefore, suggested that less ambitious goals be set before this industry. In particular, it would be desirable to limit the range of production to fishing boats and freight carriers with a capacity below 4,000 GT. Postponing the construction of ocean liners and large oil

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<sup>1/</sup> Steel-made ships only.

<sup>2/</sup> Average cost of production of Korean cargo amounts to \$400/ton, while it is only \$300/ton in Japan.

tankers will relieve the industry of the necessity of installing costly special metal-working equipment to process large parts (for large marine engines) which, considering the limited demand for such units, is very likely to remain underutilized.

76. The total tonnage of sea-going Korean vessels amounted to 151 thousand tons in 1965. Average domestic production is only about 10 thousand GT per year (out of which 40% consists of wooden ships). In line with the tentative investment plan of the Bank-sponsored Transport Survey in progress at the time of writing, the requirement for the Second Plan can be estimated at about 1/3 of the tonnage, proposed by Korean planners and should not exceed 190 thousand GT, of which more than half could be produced domestically.

77. Expansion of the motor car industry is based mostly upon an increase of production of parts. This, unfortunately, perpetuates the present orientation of the industry on replacing worn-out parts of old motor vehicles. Principal new parts, such as pistons, are produced from imported metals (aluminum) and these parts have a limited, diversified market. Rationale for such production is doubtful. Assembly of foreign-produced automobiles, both trucks and sedans, will certainly meet a local demand, which should increase by 10% p.a.

78. Electrical machinery. According to available plans, this industry will develop rapidly. At present, the scope of production is limited to small electric motors, transformers, batteries, radios, etc. Considering the low level of income and housing conditions in Korea, there may not be sufficient demand for a rapid expansion of domestically produced consumer durables, especially in view of highly competitive Japanese imports. Growth of the electrical machinery production may become, however, justified providing that the production structure emphasizes to a larger extent than at present the production of investment goods.

79. As economies of scale are particularly important in determining the cost structure here, an effort towards standardization should be initiated prior to any major new investment in this industry. Production plans for this industry may be based on a growth rate of about 15 p.a., provided new products are standardized to allow production in larger series. Production should also be linked to parallel production of such items of general machinery industry as lathes, engines, with which electrical machines would form larger aggregates.<sup>1/</sup>

80. General machinery. This branch of industry has been neglected in the past. Future demand is related to the expected growth rate of fixed capital formation, which will be about 10 p.a. (see Volume I - Main Report, Table 9, page 51). This sets a limit to the expansion of this industry. Allowing for private and public demand for various simple

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<sup>1/</sup> A lack of consideration given to this obvious principle has been felt in the past.

machines falling into the consumption bracket, and also for a certain, but necessarily limited, degree of import substitution, growth of production may amount to about 15 p.a. This growth should entail an investment of about \$60 million, permitting a substantial expansion of capacity in machine tools and construction machinery. The few machine tool factories operating in Korea have had reasonable success. A new plant producing heavy construction machinery can incorporate rolling stock into its line of production. Future (1967-71) requirements of freight and passenger rolling stock are considerable and a sizeable share of it can be supplied from domestic production (see Korea Transportation Survey, IBRD, Section VI, Chapter 7).

81. Basic metals. Production of basic metals is a bottleneck in Korean heavy industry, mostly because of insufficient capacity in pig iron and the limited scope of rolling mills. Importance is attached to the construction of a new integrated iron and steel plant. Various Government agencies as well as several outside teams have surveyed the steel industry and made forecasts of steel demand. The Mission is not in a position to resolve the outstanding issues, but a preliminary analysis of this industry highlights the main points.

82. According to the Mission's forecast, based on 1965 production data, the demand for steel should increase in the period 1965-71 at the rate of 9.9% p.a. This projection is more optimistic than that made by the MCI which sets the growth of demand at 8.4% p.a. and the EPB forecast, setting it at 9.2% p.a. The Mission roughly estimates demand in 1971 to reach about 570,000 MT of finished products or 680,000 MT of steel ingots. On a per capita basis, ingot consumption will rise from 13 kg in 1965 to 20 kg in 1971.

83. This projection is based on the following assumptions:

- (i) The composition of demand for steel in 1965 is the same as shown in the 1963 Input-Output Table.
- (ii) Exports should be excluded from the base year figure. Present exports, largely to Viet-Nam, are extraordinary in character. They may continue and even increase, but Korea should not undertake a large investment on the basis of an analysis which assumes that such exports will continue to grow.
- (iii) Output of engineering industries (machinery, transport, equipment and metal products) will rise at rates shown in Table 30.
- (iv) The use of steel in construction will increase in line with the growth of fixed investment.

Consuming Sector	1965		1971		1965-1971 Growth Rate Per Year (%)
	Share in Total Consumption of Steel (%)	Demand 000 MT	Demand 000 MT	Share in Total Consumption of Steel (%)	
Engineering Industries <sup>1/</sup>	30.2	97.5	195.0	34.3	12.3
Construction	39.1	126.2	218.4	38.5	9.3
Others	18.3	59.0	83.2	14.6	6.0
Basic Metals	<u>12.3</u>	<u>40.1</u>	<u>71.0</u>	<u>12.6</u>	<u>10.0</u>
	100.0	322.8	567.6	100.0	9.9

<sup>1/</sup> Machinery, transport equipment and finished metal product industries.

84. The present capacity for producing steel is 235,000 MT. If demand grows, as forecast by the Mission, to 680,000 MT by 1971 then there will be room for an additional plant of about half a million tons. From the standpoint of economies of scale, a half million ton facility is acceptable provided the raw material situation is favorable.<sup>1/</sup>

85. Existing iron-ore reserves with an iron content of more than 25% are estimated at about 16-18 million MT. However, reserves of relatively high grade ore (iron content of more than 40%) are of the order of 7-10 million MT. If ores with high titanium content are excluded, then the reserve figure is reduced to 6 million MT only. Furthermore, the location of the iron mines on the East coast implies a heavy transport cost either to Pusan or Inchon - the main steel manufacturing centers. Everything considered, it may prove preferable to continue to export Korean ores to Japan where they are blended with other materials. If a new steel plant is established in Korea, it will probably have to depend on imported iron ore. The Mission could not include into this estimate the deposits discovered in 1966, as their extent remained still largely unexplored. It is however, highly improbable that they will contain high grade ores.

<sup>1/</sup> The unit cost of production of a 430,000 ton plant is 8% lower than that of a 250,000 ton plant. However, a million ton plant can produce at a unit cost which is 24% lower than a 250,000 ton plant (E.C.L.A.: A Study of the Iron and Steel Industry in Latin America, New York 1964, p. 113).

86. Korea has no reserves of coking coal. The Mission is not competent to judge the probability of success of experiments, now being conducted, designed to use Korean anthracite coal for steel making. Even if these experiments establish the technical and economic feasibility of using anthracite, there will remain the problem that there is not much room for expanding Korean coal production. Viewed in the perspective of Korea's overall energy balance, fuel for a new steel plant should either be imported or anthracite (if technical experiments are successful) should be diverted from the power sector by appropriate changes in price policy. Another solution is offered by the electric reduction process; however, under Korean conditions this alternative may prove to be fairly expensive.

87. Domestic collections of scrap have been dwindling since 1962. Even at the present level of steel production, Korea is likely to require imports of about 100,000 tons during 1966. This dependence on imports is likely to increase in the future.

88. Under these rather unfavorable raw material conditions, the Mission suspects that the proposed steel plant will involve rather high cost of production. Korea can achieve a measure of import substitution with respect to pig iron and steel ingots but only at the expense of rising dependence on imports of iron-ore, coal and scrap. At present, the domestic cost of steel ingots is about \$74 per ton (open hearth production). The ex-factory price of 50 mm billet is about \$90 compared to a Japanese f.o.b. price of about \$69 and European quotations<sup>1/</sup> f.o.b. of about \$70. The Mission cannot determine the extent to which the proposed plant will succeed in reducing Korean production costs below their present level.

89. The production capacity of the non-ferrous industry is also planned to be expanded, with the main share of investment going into aluminum refining and smelting. The Mission feels that the likely growth of demand and expected production costs do not support the tendency towards investment expenditures of large magnitude. Aluminum is used in Korea for a local production of motor parts which are used as replacement of used parts of the existing fleet of motor vehicles. If installation of one or two automobile assembly lines in the Korean transport industry would materialize, the future of this type of replacement may become somehow different in view of an increasing share of standard type vehicles in the whole and, as a result, the domestic uses of aluminum may narrow down considerably. In the second place, Korea has negligible resources of bauxite and would have to rely almost entirely on imports. What is, however, more important, the country has no cheap sources of electric power, and this lack would render the process highly uneconomical. At the electricity rate charged to industry, the cost of

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<sup>1/</sup> Low European price of billets has been influenced by the present recession in the steel production in Europe.

electric power per ton of aluminum would amount to about \$160<sup>1/</sup> or 30% of the import price of aluminum. This cost amounts to about \$60 in certain countries with rich deposits of bauxite but no sources of cheap electricity<sup>2/</sup> and to about \$40 or less in countries producing cheap electricity but without bauxite deposits.<sup>3/</sup> Moreover, considering the increasing capital intensity of coal mining in Korea, the cost of electric power may go up especially as the present supply of electric power is only just ahead of demand.

90. Other investment for the development of non-ferrous metal industries is directed towards the expansion of zinc smelting facilities. Korea's average annual import of zinc is about \$3 million. Its application may be as alloy in the production of antifriction metals and brass, as well as for piping and dry-cell batteries. These specific and narrow uses are not expected to increase radically in the future. There is no mine engaged exclusively in zinc mining in Korea, as it is associated there with other metals such as gold, silver, copper and lead. The value of zinc ores mined in 1964 barely reached \$300 thousand.

91. The above limitations do not justify important investments in the non-ferrous metals industries.

92. Non-metallic minerals. This industry is divided into three main branches: cement, sheet glass, and ceramics. Demand for cement is expected to rise from 1.3 million MT in 1965 to 3.4 million MT in 1971; that is at the same annual rate (17.5 percent per annum) as during 1956-65. There is in Korea, as in other developing countries, a preference for permanent structures which implies a displacement of other building materials by cement. The combined capacity of seven plants operating at present is about 1.7 million MT. The industry plans to expand capacity to keep up with domestic demand. Limestone of adequate quality is available but gypsum must be imported. Domestic prices are about 18% higher than import prices c.i.f.; however, the industry expects to reduce costs by about 6% through economies in quarrying and in use of power and labor.

93. Sheet glass. Both the growth in domestic demand and the export target are in conformity with the Mission's projections. Investment needed to extend productive facilities in the sheet glass industry are estimated by the Mission at \$3.7 million during the period 1967-71.

94. Ceramics. In this field the Mission has doubts as to the targets proposed by the Korean planners. The industry has a long tradition. All raw materials are available in Korea. However, the industry cannot claim any success in the field of exports. The degree of waste<sup>4/</sup> is quite high (16%) and export prices are 34% below the production cost. Furthermore, the designs are far from being able to attract potential customers. The target

<sup>1/</sup> At 9 mills (in US ¢) per Kwh and 18,000 Kwh/ton of aluminum.

<sup>2/</sup> Such as Greece, where the cost of electricity charged to new aluminum plant is 4.37 mills per Kwh.

<sup>3/</sup> Such as Norway, at 1-2 mills per Kwh, or Northwest of the United States at 2 mills/Kwh.

<sup>4/</sup> Rejected or broken production.

of exporting 42% of production can therefore be attained only after a major change in the entire ceramic industry has taken place. The quality of locally produced tiles is quite uneven. Facing tiles seem to possess quite good characteristics, being durable, fireproof, moisture and water resistant and meet construction requirements. A high incidence of idle capacity and the good quality of the product have led producers to think about export possibilities, but so far with little success. Japanese funds have been allegedly attracted into this industry and ambitious export plans aim at reaching a target of US\$8 million annually during the 1967-71 period. It is quite difficult to assess the prospects of reaching this goal. It has been derived from the fact that the USA imports considerable quantities of ceramic tiles (in 1964 US\$29 million worth, of which 76% came from Japan). Korea possesses excellent raw materials which when combined with Japanese funds and know-how seem to point to an excellent combination. In order to export, in 1971, about US\$8 million worth of facing tiles, something like 1,200,000 pyongs<sup>1/</sup> of tiles are to be exported. If we add to this figure 250-300,000 pyongs to meet domestic demand, the present capacity should increase from 400,000 pyongs to 1,500,000, i.e., almost four times over. This should entail investment outlays of about \$3 million.

95. With regard to the export of pottery and chinaware, the absorptive capacity of the world market remains considerable. United States imports of pottery in 1965 exceeded US\$70 million, over a half of which came from Japan and 15% from Great Britain. The growth of U.S. imports throughout the period of the last few years amounted to 8% p.a. A sizeable contract for about one million dollars was tentatively concluded between US importers and Korean producers in 1965, but the quality requirements were not met by chinaware factories in Korea and only US\$20 thousand worth of chinaware are to be exported under this contract. This is an indication of technological improvements needed in industry.

96. To promote exports of Korean chinaware during the Second Five Year Plan period, three basic steps should be undertaken:

- (i) Contacts with large department stores or importers in major developed countries should be organized to orient the production of Korean chinaware to a mass consumer market.
- (ii) Original designs should be found or adopted from Korea's artistic past.
- (iii) Technical improvements should be undertaken in the industry.

97. Korean authorities hope that exports of ceramic products (excepting tiles) will reach a value of U.S. \$20 million in 1971, i.e., several hundred times the present level. If allowance is made for a 4% increase in domestic consumption, present productive capacity would have to be increased five times. The estimated additional investment would, according to the Mission's tentative calculation, require about \$23 million. This amount of investment would certainly be premature at this time. An initial investment should be directed into the establishment of a pilot plant, installed within a medium-size ceramic technological center, which may induce consumer demand abroad through exports of experimental samples of chinaware, determine

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<sup>1/</sup> At the unit price of US\$2 per m<sup>2</sup>, i.e., US\$6.6 per 1 pyong.

the optimum size and technology of future plants, and investigate business and technical problems connected with this major venture. The expenditure necessary to create such a center would require a foreign component of about US\$2.6 million. Construction of the pilot plant may take about 30 months. Exports from it may not exceed US\$1.5 million per year. After its initial operations in 1968, a further investment in about two new regular ceramic plants may be envisaged, before the end of the Second Five Year Plan. Total investment outlays and total exports may be as follows:

<u>Venture</u>	<u>1967-71 Investment (\$ million)</u>	<u>1971 Exports (\$ million)</u>
Pilot Plant and Ceramic Center	2.6	1.5
Two Ceramic Plants (newly built)	4.4	4.0
Existing Plants	<u>Nil</u>	<u>1.0</u>
	7.0	6.5

#### B.. Intermediate Goods

98. Petroleum and coal products. An oil refinery, situated in Ulsan, is operating now at slightly over 35,000 B.P.S.D.<sup>1/</sup>, which is its full capacity. Motor gasoline refining amounts to only 10% of this product mix, which may be considered as relatively uneconomical, but typical for low-income countries with a limited number of motor cars in circulation.

99. The Mission expects that the demand for petroleum products will increase at a growth rate of 11.6% per annum.<sup>1/</sup> Underlying the Mission's forecast are the following hypotheses:

- (i) Gasoline consumption will rise 50% faster than the fleet of motor vehicles. The latter will increase 10% per annum. (IBRD Korea Transportation Survey, Vol. I, Section VII, Ch. 9 t. 70.)
- (ii) The consumption of the power sector will increase at a faster rate than power use. The assumption is that oil will be substituted for coal in the new thermal plants in response to deliberate changes in price relations.
- (iii) The consumption of the industrial sector will rise rapidly on the assumption that a petro-chemical complex and the nitrogen fertilizer plant will be established before the end of the Second Plan.

<sup>1/</sup> Civilian consumption of petroleum products increased 12.6 percent per annum from the average of 1956-58 to the average of 1963-65. However, demand increased by only 5.9 percent per annum during 1962-65.

- (iv) The bulk of military consumption will continue to be imported.

DEMAND PROJECTION FOR PETROLEUM PRODUCTS

(thousand barrels)

Consuming Sectors	1 9 6 5			1 9 7 1		
	Gasoline	Fuel Oil	Total	Gasoline	Fuel Oil	Total
Transport	812	3,889	4,701	1,876	5,708	7,584
Industry	94	2,095	2,536 <sup>1/</sup>	137	2,735	6,457 <sup>1/</sup>
Power	-	52	1,247	-	1,464	2,659
Household	-	-	427	-	-	517
Total	906	6,036	8,911 <sup>1/</sup>	2,013	9,907	17,217 <sup>1/</sup>

<sup>1/</sup> Including Bunker C and other derivatives of petroleum.

Source: Mission Estimates.

100. As the refinery is operating now at its full capacity, a further extension seems to be imperative so that the domestic demand for petroleum products is met at least during the next few years. The basic installations were constructed with a view to future expansion. With crude unit revisions and platformer revamp, and an addition of a saturate gas concentration unit, merox unit, and a cooling tower, the refinery should be able to increase its capacity by about 57%, i.e., from 35,000 BPSD to 55,000 BPSD. Time necessary for these additions should not be excessively long, and should not even take a full year to complete. The total cost may reach some US\$6 million, which is about 30% of the initial investment. The expansion should be accomplished by the end of 1966, and, under the assumption that the Mission's projections hold true, should be sufficient to meet the domestic demand until 1970<sup>1/</sup>, when the construction of a new refinery would be necessary to meet the increased demand of the last year of the Second Plan, and should be oriented to meet the demand of the years during the Third Plan.

<sup>1/</sup> Demand for petroleum products will increase until 1969 at a rate lower than the projected average, and rise steeply afterwards, when the new petroleum-consuming projects start production.

101. At least three main problems need to be investigated before any decision as to the Second Oil Refinery is taken: (i) choice of location; (ii) size of refinery; and (iii) structure of demand.

102. The choice of location determines largely, in Korea, the price of the final product and in this case may be as or more important than the cost of fixed investment. The main market for petroleum products is the Seoul Area consuming more than 40% of the total product. However, the cost of the sea transport from the refinery (Ulsan) to the port nearest to Seoul (Inchon) is approximately the same as ocean transport from the Arabian Sea to Ulsan. The reason for this is the small capacity of Korean coastal tankers as compared to foreign ocean tankers. It may therefore be a good solution to build the new refinery on the West Coast, nearer the market. There exist, however, some technical difficulties (high tidal water and shallowness during the ebb time) which make mooring difficult.

103. It would therefore be advisable that the decision as to the future choice of location is made on the basis of:

- (i) Findings regarding Inchon of the Bank-sponsored Transport Survey Mission, which were recently made available to the Korean Government.
- (ii) Tentative industrial development plan for the period 1971-1976 (as the new refinery is supposed to cover the demand of that period).
- (iii) Some exercises in linear programming, as applied to the minimization of costs of transportation to consumers (G.B. Dantzig, A. Charnes or other models).

104. As regards size, the equipment in the refinery should be designed to handle a small output (30,000 BPSD) and later, when justified by the demand, a higher output of about 50,000 BPSD. If this procedure is adopted, investment expenditures involved should not exceed \$18 million to be disbursed in 1970-71.

105. According to Mission estimates, the structure of demand will be only slightly changed in 1971, with 12% of the total product going into motor gasoline refining, compared to 10% in 1965. But if a new refinery is constructed before that time, its product should be oriented towards satisfying the demand of three possible new customers, a fifth fertilizer plant, a petrochemical complex and a new thermal power station. This new demand would be, therefore, mostly for naphtha and fuel oil (1.4 million barrels of naphtha per year for fertilizers, about 1 million barrels per year for the petrochemical complex and over 1 million barrels of fuel oil for power station) which equal only 30% of the lowest possible refining capacity of the new refinery.

106. The justification for the early construction of a second refinery would be more apparent if the pricing policy for heavy oil (for industrial and power generation uses) and LPG (for heating and cooking) were revised in the light of the country's overall energy balance. Coal is becoming scarce in Korea, and coal mining is becoming more capital intensive as surface reserves are being depleted and shafts have to be sunk deeper. The Mission's calculation made on the basis of new prices for coal (coal prices were increased in September 1965) shows that the use of coal in thermal plants of the Korean Electric Company have only a 5% cost advantage over oil and if the price for liquid fuels were reduced by only 10% <sup>1/</sup> this margin would cease to exist. In view of the rapidly increasing demand for coal for household use and the desirability of protecting the country's forest resources from being consumed for household purposes there would be great merit in a switch from coal to heavy oil use in electric power generation. A moderate reduction in the price for heavy oil could be offset by a price increase for petroleum and petroleum products. The general reduction in January 1966 of prices for petroleum and its products went in the opposite direction. A 21.1% reduction of prices for motor gasoline seemed to have no economic justification, as the demand for gasoline is scarcely price-elastic. A reduction in the price of heavy oil would also be important for ceramic kilns or open hearth steel furnaces which are operating on a very tight production cost schedule.

#### Chemical industry

107. This industry can be broken down into its three main branches: fertilizers, acid alkali and petrochemical products.

108. Fertilizers. Although two large fertilizer plants have been built in Korea in the early 1960's, a large share of the demand for fertilizers is still covered from imports. Korean authorities have accelerated construction of the largest (Han-kuk) fertilizer plant, which would start supplying the domestic market for nitrogen fertilizer in 1967. Two remaining plants, under construction (Yong-nam and Chin-hae) would commence their supplies of complex fertilizers also in that year. Construction of fertilizer plants will be, therefore, virtually completed in 1966.

109. The country would attain, by 1971, a self-sufficiency in nitrogen fertilizers, which the farmers have learnt to use and to appreciate. A deficit in the production of phosphate and potash fertilizers would remain.

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<sup>1/</sup> Carrying and operation charges being different for coal and for oil plants, the economic advantage is not directly proportional to alternative prices of fuel.

Korean farmers seem to have accepted these fertilizers, albeit much more slowly than nitrogen. <sup>1/</sup> Korea is short of phosphate rocks, sulphur and potash deposits and in 1971 about 40% of demand in phosphate fertilizer and 60% of demand for potash fertilizers will have to be supplied from imports.

110. The present and projected situation in the supply of fertilizers can be assessed as shown below:

<u>Supply/Type of Fertilizer</u>	(In 1,000 tons of plant nutrient)						(\$ million)
	1965			1971			Investment necessary <u>1966-1971</u>
	<u>N</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>	<u>N</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>	
Chungju	40	-	-	39	-	-	
Naju	35	-	-	39	-	-	
Yong-nam	-	-	-	72	50	22	44.2
Chin-hae	-	-	-	72	50	22	45.1
Hang-kuk	-	-	-	152	-	-	50.0
Others	-	-	-	-	31	15	
Total domestic supply	75	-	-	374	131	59	139.3
Demand	250	166	82	316	222	148	
Imports	175	166	82	-	91	89	
Exports	-	-	-	58	-	-	

<sup>1/</sup> On the whole, however, use of fertilizers is still falling short of the target. For instance in 1965, the use of all three (NPK) fertilizers was only 393 thousand tons, compared to the target of 486 thousand tons.

111. The acid-alkali industry comprises a large range of products processed from salt, phosphate, and sulphur. The two largest investments in this group are to be made in soda-ash and ammonia plants. Imports of soda ash reach about \$1.5 million p.a. and are used mainly in the production of glass and inorganic chemicals. A light soda ash can be used for the production of detergents but there is no productive capacity for this now in Korea. Consumption of soda ash reached 26,000 tons in 1965 and will probably increase continuously. Therefore, the projected capacity of a new plant of 50,000 tons/year may meet sufficient market demand by 1971. The capacity of a soda ash plant depends on the number of carbonators (each having a capacity of about 15,000 tons) and it is always possible to add additional ones later. A larger problem, however, is the choice of the technological process. Of the two main processes the Solvay process is more expensive and using it the cost of production will be about the same as the import price. Moreover, it uses sulphuric acid, which is in short supply in Korea. The dual process is far cheaper, but depends on ammonia supplies. Since the demand for ammonia is expected to go up sharply because of the new fertilizer plants there is likely to be scope for an increase in ammonia production. If the petrochemical complex is constructed, uses of the off-gas (synthesis gas) and of naphta may offer a relatively cheap source of production of ammonia. The future development of the chemical industry should be viewed as an interrelated complex. Partial solutions, although capable of satisfying current demand for a particular product, may prove uneconomical in a broader perspective.

112. Petrochemical industry. The major point to consider here is that of economies of scale. The cost of material input and of capital represent between 60 and 80 percent of the total cost of production, so it becomes clear that the fullest possible utilization of productive capacity as well as the maximum utilization of by-products are prerequisites to any profitable and justified investment in this field. Another consideration may prove to have considerable importance in the Korean economic situation. If the petrochemical industry is viewed as being rather capital-intensive and as producing substitutes for labor-intensive products, such as textile fabrics, leather goods, etc., its establishment may bring undesirable changes in Korean manufacturing by eliminating some of the labor-intensive processes.

113. The main problem faced by the petrochemical industry is the size of domestic demand. The existing demand is mostly centered around plastics and synthetic fibers. At present, there is substantial over-investment in the plastic industry in Korea. Present capacity (extruders, calendars, injection moulding machines) can easily use about 27 thousand metric tons of plastics per year, but the total imports of synthetic resins, the raw material of this industry, amounts to about 9 thousand

tons per year and is still limited by a quota system and made expensive through supplementary taxes doubling the import price. Therefore only 35% of the productive capacity of this industry is being used. The domestic market for synthetic plastics products seems good. Its present and future potential falls, broadly into: consumer goods (such as leather imitation items -- bags, sandals, raincoats, etc.), packing sheets made of polyethylene, as a substitute for wood in the construction and furniture industries, and for electrical appliances (mostly cable coating). In spite of the high price of synthetic resins and the under-utilization of capacity, the profit rate in the industry is high, about 20% on sales. This is due to the virtual monopoly position of the industry. The cost of materials is 80% of production costs. The area in which plastics can be substituted for conventional materials in Korea is quite large. Considering that business profits are considerable and that existing productive capacities do not require any further investments, manufacturers may be sufficiently interested to promote this substitution when raw material supplies become less scarce.

114. The construction of a petrochemical complex in Korea deserves consideration for the following reasons:

- (i) Korea lacks natural resources to build its chemistry around other technological processes. Although it possesses coal resources, the quality is not adequate for chemical processes and the use of it through gasification involves high investments in oxygen plants. Korea also lacks natural gases.
- (ii) A petrochemical complex may result in immediate import substitution (PVC, polyethylene, synthetic fibres). This positive effect on the balance of payments will only partly be offset by increased imports of raw materials (crude oil or naphtha) and equipment. The present imports of products which could otherwise be produced by a fully developed petrochemical industry (i.e. including synthetic fibre) amount to about \$30 million per year. The figure would be higher if there were no quota restrictions.

115. The cost of investment necessary to build a petrochemical complex in Korea should reach, according to Mission's estimates, about \$70 million (for a plant producing 35,000 tons of ethylene per year).

116. Notwithstanding the fact that the creation of a petrochemical complex is now under consideration in Korea, authorization was recently issued to establish a plant which will produce synthetic resins (PVC) from calcium carbide (acetylene). This type of production is bound to be very costly in view of the high power consumption and excessively high ash content of Korean coal.<sup>1/</sup> Production cost may come to about 20 cents per lb., which is about 60% higher than the import price (c.i.f.-Korea) paid for PVC. Production will also be more costly than polymerization of vinyl chloride within the petrochemical complex would be. However, more important is the fact that acetylene-based production of vinyl chloride diminishes the justification for creating a petrochemical complex. The present (acetylene-based) plant is to be completed by the end of 1966 and is expected to expand to 13,200 MT/year of PVC in 1967.

117. The total potential demand for ethylene, which is the main output of the petrochemical industry, may reach some 30,000 MT/year by late sixties. Out of this some 7 thousand tons may go into polyethylene film (for packing), about 7-10 thousand tons into the fabrication of polysterene for furniture, household appliances, and 10-15 thousand MT of PVC into consumer and industrial uses. If the domestic demand for PVC is largely satisfied from acetylene-based production, the future uses of ethylene would amount to only 15-20 thousand MT/year, which, when compared to the projected 35 thousand MT potential of the petrochemical complex<sup>2/</sup> would render its construction unjustifiable.

#### Paper

118. Estimates by Korean planners set the rate of growth of the demand during 1965-1971 at 7.5% p.a. As there is no import of finished paper products and demand is fully met by local supply, the rate of growth of production is the same as the rate of growth of domestic demand.

119. According to the Mission's analysis, this forecast is an underestimation as far as the growth of demand is concerned. As food, beverage, tobacco and other industries expand, the demand for packaging materials will continue to grow at the high present rate (15.4% p.a. since 1960) or perhaps even accelerate. Demand for newsprint and other printing and writing paper is unlikely to exceed a composite growth rate of about 7% p.a. The Mission's growth estimate for the paper industry

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<sup>1/</sup> 30% as compared to 7% desirable for this process.

<sup>2/</sup> Which is the smallest optimum size.

as a whole is approximately 11% p.a. because of the growing proportion of the share of packaging paper. This rate should continue until the first products of the petrochemical industry become available. This may take place only in the last year of the Second Plan.

120. In the Mission's opinion the investment required is only about half the amount foreseen by the Korean planners.

- (i) For a 23,000 ton/year barley straw  
pulp mill ..... \$12.6 million
- (ii) For an additional 58,700 tons of  
paper making capacity ..... \$ 7.0 million  
\$19.6 million

There is considerable scope for displacing imports of pulp but domestic supply bottlenecks and technical difficulties cloud the prospects. A reduction in the availability of ground wood pulp resources from local forests has prevented the full utilization of installed capacity.

#### Textiles

121. Outlining the future development of the textile industry is a formidable task. The present structure of fixed capacity lacks homogeneity, being composed of equipment from varied vintage. Twenty-five percent of all spindles and 29% of all looms is more than 20 years old, and 40% in each category is 10-20 years old. Also, profitability appears to depend largely on import prohibition. While world prices for yarn and cotton fabrics are roughly equal to the costs of production in Korean textile industry and consequently, there are scarcely any profits on textile exports, domestic prices permit a profit on sales of almost 30%. <sup>1/</sup> This margin of profit must have been even larger in the past, when imports of raw cotton and cotton yarn were paid with overvalued domestic currency.

122. The textile industry is a composite of many products. The Mission has singled out four main products: cotton fabrics, wool fabrics, silk fabrics and synthetic fabrics. The task of making a forecast is complicated by the fact that the industry is currently moving towards a larger share of synthetic fiber textiles in total textiles production. This movement will be reinforced if a petrochemical complex would lead to domestic availability of raw materials.

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1/ Early 1966.

123. The growth of synthetic fiber manufacturing depends largely on the availability of raw materials, such as propylene, acrylonitrile, caprolactam and PVA from the projected petrochemical complex. The decision about the establishment of a petrochemical complex and the timing of its construction are therefore of great importance in determining the nature and size of investment in the textile industry. The other main factors in this respect are the future domestic demand for textile fabrics and export possibilities.

124. Domestic Demand. Domestic demand for textile fabrics has been more or less steadily correlated with private consumption expenditure. Whereas private consumption expenditure has grown by 38.8% (constant prices) over the period 1960-65, private consumption of clothing and other personal effects has grown by 35.5%, which yields an elasticity coefficient of 0.9. Assuming that the income elasticity of textile consumption would continue to revolve around 1.0, the demand for textiles as a whole should grow at about 4.6% p.a. This is even slightly higher than the assumption of Korean planners. As far as the structure of consumption of textiles is concerned, it is obvious that major changes will only occur after raw materials for the synthetic fibers industry have started to be supplied from domestic sources and also when the price structure is changed in a way conducive to domestic consumption of synthetics:

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PROJECTED STRUCTURE OF CONSUMPTION (%) <sup>1/</sup>

	<u>1965</u>	<u>1971</u>
Cotton fabrics	76	48
Wool fabrics	3	5
Silk fabrics	1	2
Synthetic fabrics	13	30
Regenerated fabrics	<u>7</u> <sup>2/</sup>	<u>15</u> <sup>2/</sup>
Total	100.0	100.0

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<sup>1/</sup> Shares in the total volume (in metric tons).

<sup>2/</sup> Viscose, acetate.

125. Exports. It is the intention of Korean authorities that future exports of textiles should grow very quickly. They are expected to quadruple within a period of six years only. It is true that the success in textile exports has been remarkable since 1961. The Mission believes, however, that the initial impressive surge is bound to slacken in the future, when the increasing volume of textile exports comes up against the hard realities of the world market.

126. As the spinning, weaving and finishing of textiles are becoming increasingly mechanized throughout the world, low cost of labor, constituting the main advantage of Korean textile exports, is becoming less of a factor in determining a nation's ability to export textile fabrics and yarns at competitive prices. While Korean exports of textile items are still a tiny fraction of the world market, they are catching up quickly with such exporting countries as India or Hong Kong. <sup>1/</sup> It is tempting to infer that Korea could boost exports significantly without unsettling world markets. But the markets in which Korea hopes to sell either have an absorptive capacity limited to the extent of their import quotas (all quotas for Korean imports of cotton fabrics, in principal industrialized countries of western Europe and North America, would amount to about \$6 million only in 1965/66, if added together), or may be planning to have their own textile industries (like the majority of developing countries of Asia and Africa). Korea's ambitions as an exporter of textiles need to be tempered by the recognition that competition in the international market is becoming increasingly keen. Although it is in Korea's interest to work through GATT and other channels towards the relaxation, if not the elimination of quantitative curbs on the international textile trade, the Korean textile industry can hardly assume that its products will be welcomed in the world market.

127. Another point worth taking into consideration while promoting exports of textile fabrics from Korea is profitability. Data on profits are not fully reliable, but from whatever information the Mission has been able to collect it transpires that cotton textile exports run on the verge of profitability.

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PROFITABILITY OF PRODUCTION AND SALES (1965/66)

	<u>Unit</u>	<u>Cost of Production</u>		<u>Sale Prices</u>			
		<u>Won</u>	<u>US\$</u>	<u>Domestic</u>		<u>Export.</u>	
				<u>Won</u>	<u>\$</u>	<u>Won</u>	<u>\$</u>
Cotton yarn	400 lbs	48,850	180.9	63,000	233.3	48,490	179.6
Cotton shirting	40 yds	1,713	6.3	2,200	8.1	1,700	6.3
Poplin	"	3,500	13.0	3,600	13.3	2,800	10.4

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128. Both these elements, i.e. increasing difficulties in the way of Korean exports of textiles and doubtful profitability, induce the Mission to suggest more modest rates of growth for textile exports from Korea:

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<sup>1/</sup> In 1964 Korea's exports of cotton cloth were 26.6 thousand MT, while India has exported 67.0 thousand MT and Hong Kong 43.7 thousand MT. In 1960 exports of cotton cloth from these three countries were, respectively, 2.9 thousand MT, 82.1 thousand MT and 34.7 thousand MT.

EXPORTS OF TEXTILES AND CLOTHING  
US\$ Million

<u>Main products</u>	<u>1965</u>	<u>(Mission Est.)</u> <u>1971</u>	<u>Rate of growth p.a.</u>	
			<u>Mission</u>	<u>Plan</u>
Cotton fabrics	10.5	35.0	23.0	30.0
Silk fabrics	0.4	8.0	64.0	70.0
Other fabrics <u>1/</u>	13.9	34.0	16.1	16.1
Yarn	1.5	7.4	31.0	31.0
Clothing <u>2/</u>	<u>20.7</u>	<u>49.0</u>	<u>15.4</u>	<u>15.4</u>
Total	47.0	138.4 <u>3/</u>	19.7	22.0

1/ Mainly rayon, woolen and synthetic fiber fabrics; knitted, embroidered sewing goods.

2/ Outer garments, sweaters and socks.

3/ Includes exports of other textile products, for \$5.0 million.

129. If the Mission's assumptions prove correct, the share of exports would reach 23.7% of the total production of textile fabrics in 1971<sup>1/</sup>. As currently exports are being sold at prices often slightly below the costs of production, the increasing share of exports may require vigorous efforts to increase efficiency and lower the production costs of the industry significantly.

130. At the growth rates for demand and exports of textiles, projected by the Mission, a total absolute increase of the value added in this industry during the period 1965-1971 would amount to about \$65 million. According to this, admittedly very rough yardstick, the Mission concludes that the further development of the textile industry may not require investment of more than \$85 million (net) or \$170 million (gross), during the entire period of 1966-71. The capital: value added relation in this industry is, in principle, revolving around the ratio of 1.3 (net) or 2.6 (gross). There are indications, however, that this ratio would tend to reach a far higher level, according to the EPB calculation underlying the 2nd Five-Year Plan. It is, therefore, highly important that this investment is kept within reasonable limits and is directed at modernizing the technological processes in this industry, so that any possible losses on export production are avoided.

131. The Mission also recommends that immediate action be taken to improve management in the textile industry. Better management should not only contribute to a rise in productivity of existing fixed capital, which would permit additional output without substantial additional investment outlays, but would also result in a better use of imported cotton and fibers.

132. Korea still needs 8.76 employees per bale of cotton (20's) versus 5.28 in Japan, and it produces 0.364 pounds of yarn per spindle (8 hours, 20's) versus 0.516 pounds in Japan. Productivity in the cotton textile industry was,

1/ In value terms. In physical terms (weight or yardage) this share would be higher.

roughly, equal in both countries in 1955, but since then Japan made quicker progress than Korea.

133. Rubber. Korean officials expect a gradual further development of the rubber industry. The rate of growth of demand is expected to be 5.1% p.a., and exports should reach \$11.7 million in 1971, which would bring the rate of production growth to 8.3% p.a. No major investment is foreseen for this industry. Export targets for 1971 can be broken down into rubber and canvas shoes (\$10 million) and exports of rubber tires (\$1.7 million). As far as future exports of footwear are concerned, some basic assumptions seem to underlie it, such as: the expectation that the United States will continue to import about 50 million pairs of rubber shoes. The share of Korean exports barely reaches 8% of this total (1965) whereas Japanese exports fill almost the entire balance. As labor costs comprise only 10% of the total export price of Korean rubber footwear, and they reach a higher percentage in Japanese-made export boots and shoes (18-23% of the price), there is a definite hope attached to the competitiveness of the Korean export of footwear as compared to the Japanese. In addition to this it is expected that a rising share of footwear exports will be taken by the markets of Canada, Australia and Western Europe. As far as tire exports are concerned, projected increases are based upon future trade openings in the Vietnamese market.

134. The Mission considers that the export of rubber footwear amounting only to US\$5 million in 1971 can be judged as possible and realistic. As far as rubber tires are concerned it is hardly probable that exports can pass the limit of US\$1 million. Both these figures shall bring down the expected export target for the rubber industry from US\$11.7 to US\$6 million, cutting it, therefore, by half. The Mission estimates that the increase of domestic demand for rubber shoes should grow at the rate of 4.2% p.a., and the demand for tires at the rate of 8.8% p.a. As the existing excessive productive capacity in both these branches will allow additional production, no further capital investment is necessary in this industry.

135. Wood products. The Mission was able to examine only plywood and veneer, which accounts for about 60 percent of the value added in this industry. There is no formal plan for this industrial branch. Plywood and veneer production is predominantly export-oriented. Seventy-five

percent of the output is exported. Export plans set a target of \$35 million for plywood and veneer in 1971. The projected 12.3% p.a. rate of growth of exports is only slightly above the rate of growth of US imports, 10.9% p.a. in quantity terms, in the last decade, induced by the phenomenal increase in domestic consumption of plywood in this country. Korean projections do not, however, take into consideration the possible reaction of competitors in the Philippines, who possess their own raw material resources and enjoy preferential entry tariffs in the US. Also, the competition of China (Taiwan) cannot be discounted.

136. The Mission has examined three possibilities regarding Korean exports of plywood:

- (i) Decline or maintenance of export prices for plywood, (the long-term trends show a slow decline of export prices);
- (ii) Decline or maintenance of rate of growth of US imports;  
and
- (iii) Decline or maintenance of the comparative advantage in the wage-cost of the Korean plywood industry, as compared to Japan, Philippines and China (Taiwan).

137. Under the optimistic assumption of the maintenance of the status quo, the export projection of \$35 million could be attained. The pessimistic assumption involves the rise in US imports of plywood to only 109 million dollars in 1971, and the Korean share in it being 20%. This should bring Korean exports in 1971, up to a target of 21.8 million dollars, which implies a conservative growth of 3.4% p.a. A moderate export projection would probably be between the optimistic and pessimistic assumption, i.e., on the level of US\$28.4 million in 1971. As compared with exports of \$18.0 million in 1965 this presents an attainable goal, at the rate of growth of 8.1% per year.

138. The productive capacities of the Korean plywood industry allow processing, as of January 1966, 970 million square feet of plywood per year. Production reached 700 million square feet in 1965. Supposing that exports increase at the rate of 8.1% p.a., as projected, and that domestic consumption remains at its highest level of 180 million square feet (observed in 1962 and 1965 only), increase of production to 1,000 million square feet (820 million square feet for exports and 180 million square feet for the domestic production) should meet both export and domestic targets. Allowing an additional 10% as a technical reserve,

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<sup>1/</sup> Concurring with the Yale University projection, setting US imports of plywood at the level of \$106-114 million in 1971 (Bela Balassa "Trade Prospects for Developing Countries", Yale, 1963, p. 444).

productive capacity of 1,100 million square feet should entail an investment of about \$3.7 million.<sup>1/</sup>

C. Consumer Goods Industries

139. Food Processing Industry. As seen from an analysis of the past, this industry has been growing at a very low rate of 1.1% p.a. during the last five years. No future production plan exists for this branch. Export targets set before this industry are broken down as follows:

	<u>1971</u> <u>(\$ million)</u>
Processed beef	4.5
Canned fish	12.0
Canned mushrooms	<u>2.9</u>
	\$19.4 million

140. Investment plans may call for fixed capital expenditure of about \$11 million within the Plan period. Considering that substantial equipment loans have been launched for this industry in 1965, by the KRB, it may be expected that the fixed investment in 1966 shall reach some \$3 million adding to the program for 1967-71.

141. The income<sup>2/</sup> elasticity of food products is relatively low, being only 0.82 during the period 1960-1965.

142. The Mission expects that the income elasticity for food will remain below unity, which should set the growth of demand for food at 4.6% p.a. It cannot be expected that the share of unprocessed food will continue to grow in the future<sup>3/</sup>, therefore consumption of processed food shall grow probably at the same rate as total food consumption, if not more. Its share of exports would be only 5.5% of total production of processed food at the end of the Second Five Year Plan.

143. Clothing. Export plans for the clothing industry are quite substantial and amount to \$4<sup>0</sup> million in 1971, which implies a growth of 15.4% p.a. during the period 1965-1971. This growth expectation may

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<sup>1/</sup> At a cost of \$48 thousand per each 1,000 m<sup>3</sup> of capacity (1.7 million square feet), Asian Conference on Industrialization, Study on Forest Product Industries, Manila, December 1965, p.49.

<sup>2/</sup> Or, more precisely, private consumption expenditures.

<sup>3/</sup> This share grew considerably in the recent past.

not be unduly optimistic; world exports of cotton clothing climbed from \$230 million in 1953 to \$990 million in 1964, increasing at the rate of 14.2% p.a. The Mission is, therefore, inclined to believe that export targets can be attained especially if it is considered that the principal importers of Korean clothing are exclusively high-income countries, such as United States, Sweden and the Netherlands, where labor costs are high. Korea should emphasize the export of clothing and made-up textiles rather than the export of fabrics. Exported clothing over the three years 1963-1965 has involved an average value per metric ton ranging from \$2,500 to \$3,000. Prices of exported fabrics were about \$1,000 per metric ton in 1963, dropped in 1964, and dropped still further in 1965. Although these prices are not, of course, strictly comparable, they indicate the advisability of further study of the gains to be secured by exporting relatively more clothing and less fabric. Korea's chief competitor in the international market for cotton clothing is Hong Kong, which in 1964 exported apparel valued at \$155 million. As far as domestic consumption of clothing is concerned, it should grow at the same rate as projected for textiles, namely at 4.6% p.a.

144. The Mission is inclined to believe that, although production of clothing is done mostly at the unmechanized artisan level, the fact that a large increase of sweater exports is planned may entail the necessity of investment in knitting machines. Also, the number of sewing machines used in this industry will probably increase. It is, therefore, recommended that an investment of \$8-10 million be foreseen for the clothing industry.

145. Tobacco. There is no plan for the production of tobacco, although the export plan is quite substantial. Exports of tobacco were only \$0.9 million in 1965. According to the plan they are expected to rise to \$6 million in 1966 and will remain unchanged until the end of the Second Five Year Plan. According to information, collected elsewhere, some West-European importers of tobacco may divert a part of its imports from the Balkan countries to Korea. This may make this goal easier to attain.

146. Beverages. No detailed information as to the prospects of this industry exist. It does not suffer from any lack of raw materials, considering the surpluses of sweet potatoes in Korea. No specific export possibilities can be envisaged here. Domestic demand for beverages was rather uneven in the past, with a slight tendency to fall (income elasticity coefficient, calculated in constant prices being 0.92). The future of production in this industry depends upon the price and fiscal policy of the Government. If the past elasticity holds true in the future, and there is a likelihood that it may, the projected growth of the beverage industry should attain 4.7% p.a.

Table 1: LONG TERM GROWTH TRENDS OF MANUFACTURING PRODUCTION AND IMPORTS

Manufacturing Production			Imports of Manufactures			
Industrial Branches	Rates of Growth p.a. <sup>1/</sup>		Code	SITC Groups	Rates of Growth p.a. <sup>2/</sup>	
	1955-57	1959-61			1956-57	1959-61
	1963-65	1963-65			1963-65	1963-65
<u>A. Investment Goods</u>			<u>A. Investment Goods</u>			
Transport equipment	13.8	33.0	73	Transport equipment	9.1	55.0
Electric machinery & appl.	30.0	29.0	72	Electric machinery	4.8	8.6
Machinery	2.1	1.6	71	Machinery	9.4	14.7
Base Metal	14.2	8.5	67/68	Base Metals	8.3	25.0
Metal products	12.0	14.1	69	Metal manufactures.	12.0	30.0
Clay, glass, stone			661-02	Cement	-11.0	14.1
(including cement & glass)	16.0	16.5	664-03	Glass	gradually eliminated	
Total, Group A	13.9	18.0		Total, Group A	7.0	19.7
<u>B. Intermediate Goods</u>			<u>B. Intermediate Goods</u>			
Chemicals (including fertilizer)	23.0	18.5	5(-56)	Chemicals	8.3	11.3
Paper	19.0	16.4	56	Fertilizer	-0.5	3.6
Textiles	6.2	8.1	64	Paper	-0.3	5.4
Rubber	11.3	6.1	65	Textiles	1.2	9.6
Wood and cork	6.1	7.7	62	Rubber	gradually eliminated	
Petroleum		40.0	63	Wood and cork	negligible	
			31(-31101)	Petroleum products	3.8	3.6
Total, Group B	11.4	15.4		Total, Group B	0.9	5.1

Table 1: LONG TERM GROWTH TRENDS OF MANUFACTURING PRODUCTION AND IMPORTS (cont'd)

Manufacturing Production			Imports of Manufactures			
Industrial Branches	Rates of Growth p.a. <sup>1/</sup>		Code	SITC Groups	Rates of Growth p.a. <sup>1/</sup>	
	1955-57	1959-61 1963-65			1956-57	1959-61 1963-65
C. <u>Consumer Goods</u> <sup>3/</sup>			C. <u>Consumer Goods</u>			
Tobacco	7.1	10.3	12 Tobacco		gradually eliminated	
Beverages	6.1	1.9	11 Beverages		" "	
Leather	1.3	1.9	84 Clothing		" "	
Food	5.1	1.1				
Printing	13.0	14.0				
Total, Group C	6.6	5.4				
Total, Manufacturing Industries	11.0	12.0 <sup>4/</sup>	Total, Imports of Manufactures		2.7	10.6 <sup>5/</sup>

<sup>1/</sup> In terms of physical increase of industrial production.

<sup>2/</sup> In terms of dollar value of imports of manufactures. Underlying data is subject to some reservations. A sizeable share of imports during the late 1950's and early 1960's could not be properly classified.

<sup>3/</sup> Rate of growth of clothing manufacturing is not available.

	<u>1955-57</u>	<u>1959-61</u>
	<u>1961-65</u>	<u>1963-65</u>
<sup>4/</sup> Growth in Value added of manufacturing p.a.	9.4	12.1
Growth of all sectors of the Korean economy p.a.	5.3	6.3
<sup>5/</sup> Growth of Total Imports p.a.	1.5	10.0

Table 2: LONG TERM GROWTH TRENDS OF MANUFACTURING  
PRODUCTION IN DEVELOPING COUNTRIES

Country	Period	Growth p.a.	Relation between growth of the GNP and growth of mfg.
Korea	1955/57- 1963/65	11.0	1.72
	1959/61- 1963/65	12.0	1.97
Philippines	1957-65	5.5	1.34 <u>/1</u>
	1960-65	5.0	1.34 <u>/1</u>
China (Taiwan)	1957-65	13.7	
	1960-65	14.8	1.24 <u>/2</u>
Spain	1959-65	10.9	
UAR	1959/60- 1963/64	9.6 <u>/3</u>	1.50
Less industri- alized countries	1956/57- 1963/64	7.2	
South East Asia <u>/4</u>	1956/57- 1963/64	8.3	

/1 1959-63 constant prices.

/3 Includes mining.

/2 1959-63 in current prices.

/4 Excluding Japan.

Source: Monthly Bulletin of Statistics, UN, New York, 1966.

Bent Hansen and Donald Mead; The National Income of  
the UAR Memo No. 355, The Institute of National Planning,  
Cairo, July 1963.

Table 3: DISTRIBUTION OF MANUFACTURING VALUE ADDED & MFG. IMPORTS ACCORDING TO END USE

Manufacturing Production			Imports of Manufactures /1			
Industrial Branches	Average Share in Total Value Added (%)		SITC Groups Code	Average share in total imports of manufactures (%)		
	1960-61	1963-65		1956-57	1959-61	1963-65
<b>A. Investment Goods</b>			<b>A. Investment Goods</b>			
Transport equipment	3.5	4.6	73 Transport equipment	4.2	1.8	6.8
Electric machinery & Appl.	0.9	1.8	72 Electric machinery	5.8	7.3	6.8
Machinery	3.7	3.4	71 Machinery	10.2	14.4	16.8
Basic metal products	2.5	2.9	67/68 Base metals	7.8	7.2	11.8
Metal products	2.3	2.2	69 Metal manufactures	1.0	1.1	2.1
Clay, glass, stone (including cement)	5.2	7.6	661-02 Cement	2.5	0.7	0.8
Total Group A	18.1	22.5	664-03 Glass	0.9	0.3	0.1
			Total Group A	32.4	32.8	45.2
<b>B. Intermediate Goods</b>			<b>B. Intermediate Goods</b>			
Chemicals (including Fertilizers)	5.1	7.2	5(-56) Chemicals	8.1	12.0	12.5
Paper	2.4	3.5	56 Fertilizers	27.6	27.3	21.0
Textiles	18.0	15.9	64 Paper	4.9	3.6	0.7
Rubber	2.3	2.5	65 Textiles	10.7	10.0	9.6
Wood and cork	1.9	2.1	62 Rubber	0.7	negl.	negl.
Petroleum & products	2.5	4.2	63 Wood and cork	0.1	negl.	negl.
Total Group B	32.2	35.4	31(-31101) Petroleum products	10.0	14.2	10.9
			Total Group B	62.1	67.1	54.7
<b>C. Consumer Goods</b>			<b>C. Consumer Goods</b>			
Tobacco	10.6	10.0	12 Tobacco	1.6	negl.	negl.
Beverages	9.4	6.2	11 Beverages	2.5	negl.	0.05
Leather	1.2	1.0	84 Clothing	1.4	0.1	0.05
Food	16.5	14.1				
Printing	3.4	3.6				
Footwear and clothing	4.9	4.3				
Furniture	1.1	0.7				
Total Group C	47.1	39.9	Total Group C	5.5	0.1	0.1
<b>D. Other Manufacturing</b>	2.6	2.2				
Total Manufacturing	100.0	100.0	Import of Manufactures	100.0	100.0	100.0
Manufacturing as part of GNP	13.6	16.8	Import of Manufactures as a part of Total Imports	51.4	55.4	56.5

Table 3: DISTRIBUTION OF MANUFACTURING VALUE ADDED & MFG. IMPORTS ACCORDING TO END-USE

FOOTNOTE

/1 The classification of imports shown here is subject to serious reservation. A sizeable share of imports during the late 1950s and early 1960s cannot be classified. Therefore, comparisons over time should be interpreted cautiously.

Sources: Shares of branches in the manufacturing production calculated from revised National Accounts (in 1960 prices) prepared by the BOK. Shares in imports based upon statistics contained in the Foreign Trade Statistics (Ministry of Finance) and Economic Statistics Yearbooks (Bank of Korea) for respective years.

Table 4: GROWTH OF OUTPUT OF MANUFACTURING INDUSTRIES  
AND RELATED MACRO-ECONOMIC VARIABLES

	<u>1955/57 - 1963/65</u>	<u>1959/61 - 1963/65</u>
1. Investment goods industries (output) (% p.a.)	13.9	18.0
2. Gross domestic capital formation (in constant prices) (% p.a.)	8.4	12.8
3. Relation between the rates of growth of investment goods industries and of gross domestic capital formation [ $\sqrt{1/2}$ (ratio)]	1.65	1.41
4. Consumer goods industries (output) (% p.a.)	6.6	5.4
5. Private consumption expenditures (in constant prices) (% p.a.)	4.7	5.8
6. Relation between the rates of growth of consumption goods industries and private consumption expenditures (4/5) (ratio)	1.40	0.93

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Source: Mission estimates.

Table 5: COMPOSITION OF VALUE ADDED IN MANUFACTURING BY BRANCH;  
COMPARISONS OF ACTUAL WITH NORMAL PATTERN

(percent of total value added)

	Food, Beverages and Tobacco	Textiles	Clothing, Footwear	Wood Products and Furniture	Paper and Paper Products	Printing and Publishing	Leather and Leather Products	Rubber Products	Chemicals, Petroleum Coal Products	Non-Metallic Mineral Products	Basic Metals	Metal Products /2	Other Manufacturing
A. Value Added in 1965 Actual /1	30.0	16.6	3.6	2.7	3.2	3.8	0.9	2.4	11.9	8.3	2.7	11.9	2.3
Value Added in 1965 "Normal" /3	35.5	14.4	5.7	4.1	1.2	2.1	2.0	0.9	8.7	8.3	4.0	11.9	1.2
Deviation of the actual structure from the pattern	-5.5	+2.2	-2.1	-1.4	+2.0	+1.7	-1.1	+1.5	+3.2	0	-1.3	0	+0.8
B. Value Added in 1971-projected pattern	31.3	14.5	5.4	4.2	1.5	2.2	1.8	0.9	9.1	8.0	4.8	14.9	1.4

/1 At 1960 prices.

/2 Including electrical machinery, transport, equipment and general machinery

/3 Equations have been taken from "A study of industrial growth," United Nations, N.Y., 1963 p 13, variables calculated by Mission, on the basis of the latest (February-March 1966) available data and deflated to the level of 1953 dollar prices to conform with parameters of the regression equations.

Note: Following variables have been introduced into equations:

Source: Mission estimates.

National Income (1965)	688.78 billion won	(1971)	978.07 billion won
Population	" 29,149 thousand	"	34,091 thousand
Per capita income	" \$87.5	"	\$106.26 (1965 prices)
Value added (all mfg.)	\$566.7 million	"	\$1,003.1 million

Deflation of dollar prices 1953/1965 = 90.2.

1971 values are based on the assumption of 6% p.a. growth of the G P, 2.6% p.a. growth in the population and 10% p.a. growth of the value added of manufacturing industry.

Table 6: COMPARATIVE ANALYSIS OF INDUSTRIAL STRUCTURE

	Unit	Manufac- turing	Food, bever- ages, tobacco	Textiles	Clothing, foot wear, made-up textiles	Wood products & furniture	Paper and paper pro- ducts	Printing & publishing	Leather and Leather prod.	Rubber products	Chemicals & chemical prod. (petroleum included)	Non-metallic mineral prod.	Basic metals	Metal products /5	Other Manufacturing
<u>PHILIPPINES - 1958 /1</u>															
Value added	%	100.0	41.4	5.8	4.3	6.0	2.1	3.9	0.3	3.3	8.0	4.2	1.2	10.7	8.8
Number of engaged	%	100.0	33.3	7.5	13.7	13.4	1.3	4.6	0.4	2.1	5.1	3.4	1.1	11.2	2.8
Value added per person - (3 pesos/US\$)	\$thou	2.0	2.5	1.6	0.6	0.9	3.2	1.8	1.2	3.2	3.2	2.9	2.1	1.9	6.5
<u>CHINA - (TAIWAN) 1959 /2</u>															
Value added	%	100.0	36.2	12.7	n.a.	8.3	3.0	n.a.	0.1	1.1	16.0	11.2	4.7	6.1	0.2
Number of engaged	%	100.0	21.6	23.5	n.a.	9.1	4.8	n.a.	0.4	3.0	10.2	10.2	7.3	8.2	1.7
Value added per person - (38 dollars/US\$)	\$thou	0.9	1.6	0.5	n.a.	0.9	0.7		0.3		1.5	1.0	0.6	0.7	n.a.
<u>KOREA - 1960 /3</u>															
Value added	%	100.0	36.6	19.2	5.1	3.5	2.2	3.7	1.2	2.4	7.0	5.0	2.7	9.3	2.1
Number of engaged	%	100.0	15.7	29.7	5.4	6.0	2.9	4.5	0.3	4.0	8.8	6.0	2.5	12.1	2.7
Value added per person - (127 won/US\$)	\$thou	0.9	1.6	0.6	0.9	0.5	0.7	0.8	3.3	0.6	0.9	0.8	1.0	0.7	0.9
<u>KOREA - 1965 /4</u>															
Value added	%	100.0	30.0	16.6	3.6	2.7	3.2	3.8	0.9	2.4	11.9	8.3	2.7	11.9	2.0
Number of engaged (1964)	%	100.0	13.7	25.7	4.8	4.5	3.3	4.7	0.6	4.7	9.8	5.9	3.3	16.4	2.7
Value added per person - (1964 - 255 won/US\$)	\$thou	1.1	1.6	0.7	0.9	0.7	1.1	0.8	1.9	0.6	1.3	1.5	1.0	0.8	0.9

- 1/ GNP per head (1958) \$115.  
 2/ GNP per head (1959) \$124.  
 3/ GNP per head (1960) \$ 75.  
 4/ GNP per head (1965) \$ 99.  
 5/ Including all kinds of machinery.

Sources: Calculated on the basis of data taken from:  
 The Growth of World Industry, UN, New York, 1963 pp 152 & 620  
 A Study of Industrial Growth, UN, New York, 1963, p. 17  
 Data collected by the IBRD Mission while in Korea  
 (National Accounts, revised 1966 version, Survey of Manufacturing Industries by the KRB, 1960/61/62/63/64/65, etc.)

Table 7: COMPOSITION OF DEMAND BY BRANCH OF MANUFACTURING - 1960

(percent of total)

Branches	Intermediate Demand			Final Demand					Total
	Own Branch	Other Branches	Total	Consumption		Exports	Investment		
				Private	Government		Fixed	Stocks	
<b>A. Investment Goods</b>									
Transport equipment	4.8	39.4	44.2	6.7	5.3	5.6	35.6	2.6	55.8
Electrical machinery	3.1	49.0	52.1	14.3	4.1	17.2	11.3	1.0	47.9
Machinery	4.5	25.0	29.5	3.2	.6	1.5	61.4	3.7	70.5
Basic metals:	8.3	78.9	87.2	.7	.7	3.3		8.1	12.8
Iron and steel	0.0	82.8	82.8			7.8		9.4	17.2
Steel products	12.3	83.7	96.0		.4	1.9		1.7	4.0
Non-ferrous products	2.6	60.6	63.2	3.6	2.1	4.1		26.9	36.8
Finished metal products	2.0	69.1	71.1	18.6	1.6	.6	.2	7.9	28.9
Clay, glass and stone	2.6	71.2	73.8	17.9	.5	2.8		5.0	26.2
Cement		98.0	98.0			1.3		.7	2.0
<u>Sub-total</u>	<u>4.1</u>	<u>62.4</u>	<u>66.5</u>	<u>8.9</u>	<u>1.7</u>	<u>3.4</u>	<u>14.3</u>	<u>5.2</u>	<u>33.5</u>
<b>B. Intermediate Goods</b>									
Chemicals:	3.3	41.7	45.0	37.5	1.8	2.7		13.0	55.0
Basic chemicals	13.7	76.7	90.4		.1			9.5	9.6
Intermediate chemicals	3.4	59.5	62.9	1.3	3.5	7.2		25.1	37.1
Finished chemical products	1.7	27.7	29.4	65.3	1.2	1.1		3.0	70.6
Fertilizer		25.0	25.0			1.8		73.2	75.0
Paper	.2	86.9	87.1	10.5	2.9	.6		-1.1	12.9
Textiles:	2.2	43.6	45.8	50.5	.2	2.5		.9	51.2
Fiber spinning	2.9	91.9	94.8	1.8		2.2		1.2	5.2
Textile fabrics	2.9	25.7	28.6	67.1	.2	2.9		1.2	71.4
Finished textile products	.1	20.0	20.0	76.9	.6	2.2		.1	79.9
Wood and cork:	0.0	78.2	78.2	11.6	2.9	3.1	2.7	1.5	21.8
Sawmills and plywood	0.0	95.7	95.7	0.0	1.5	.8		2.0	4.3
Wood products and furniture	0.0	41.9	41.9	35.6	5.9	7.8	8.4	.4	58.1
Petroleum and coal products	1.7	42.6	44.3	55.1	.1			.5	55.7
Rubber products	5.1	25.9	32.0	51.2	.8	5.8		10.2	68.0
<u>Sub-total</u>	<u>2.2</u>	<u>47.7</u>	<u>49.9</u>	<u>43.3</u>	<u>.8</u>	<u>2.6</u>	<u>.3</u>	<u>3.0</u>	<u>50.1</u>
<b>C. Consumer Goods</b>									
Food Products	6.2	22.4	28.6	66.0	.2	2.4		2.8	71.4
Beverages and tobacco	6.6	12.0	18.6	73.0	0.0	1.0		7.4	81.4
Leather and leather products	19.6	5.8	25.4	55.3	.2	3.6		17.5	74.6
Paper products, printing, and publishing	3.5	44.9	48.4	36.8	14.2	1.0		-.4	51.6
<u>Sub-total</u>	<u>6.7</u>	<u>20.6</u>	<u>27.3</u>	<u>64.8</u>	<u>1.5</u>	<u>1.8</u>		<u>4.6</u>	<u>72.7</u>
<u>GRAND TOTAL</u>	<u>4.3</u>	<u>39.3</u>	<u>43.6</u>	<u>46.4</u>	<u>1.2</u>	<u>2.4</u>	<u>2.4</u>	<u>4.0</u>	<u>56.4</u>

Note: Figures may not total due to rounding.

Source: Input-Output Table for 1960.

TABLE 8:

COMPOSITION OF DEMAND BY BRANCH OF MANUFACTURING - 1963  
(percent of total)

Branches	Intermediate Demand			Final Demand					Total
	Own	Other	Total	Consumption			Investment		
	Branch	Branches		Private	Government	Exports	Fixed	Stocks	
<b>A. Investment Goods</b>									
Transport equipment	8.1	44.9	53.0	4.1	3.5	2.2	34.7	2.5	47.0
Electrical machinery	4.8	46.9	51.7	15.7	2.4	3.5	23.6	3.1	48.3
Machinery	11.2	44.6	55.8	3.8	0.9	3.0	35.3	1.2	44.2
Basic metals	6.2	73.1	79.3		0.0	18.5		2.1	20.7
Iron and steel	7.4	89.4	96.8		0.0	0.3		2.9	3.2
Steel products	6.9	63.6	70.5		0.0	28.0		1.5	29.5
Non-ferrous products	3.3	87.7	91.0		0.2	5.5		3.3	9.0
Finished metal products	1.3	72.6	73.9	20.9	2.2	1.7		1.2	26.1
Clay, glass and stone	3.0	78.4	81.4	13.8	0.5	2.0		2.3	18.6
Cement		100.5	100.5		0.2	0.1		-0.8	-0.5
<u>Sub-total</u>	<u>5.7</u>	<u>63.8</u>	<u>69.5</u>	<u>7.4</u>	<u>1.3</u>	<u>6.5</u>	<u>13.4</u>	<u>1.9</u>	<u>30.5</u>
<b>B. Intermediate Goods</b>									
Chemicals	1.5	50.5	52.0	36.9	2.6	0.9		7.6	48.0
Basic chemicals	7.5	90.1	97.6		0.2	1.0		1.2	2.4
Intermediate chemicals	4.4	91.2	95.6	0.1	1.9	2.5		0.0	4.4
Fertilizer		52.8	52.8		1.0			46.2	47.2
Finished chemicals	0.6	37.2	37.8	54.4	3.2	0.6		4.0	62.2
Paper	17.6	63.8	81.4	15.6	0.8	0.1		2.2	18.6
Textiles	1.0	43.4	44.4	48.2	0.2	4.7		2.5	55.6
Fiber spinning	1.1	85.6	86.7	3.5		5.5		4.2	13.3
Textile fabrics	1.2	34.7	35.9	55.8	0.1	5.7		2.4	64.1
Finished textile products	0.8	18.6	19.4	75.6	0.3	3.4		1.2	80.6
Wood and cork	0.0	73.9	73.9	9.8	1.6	9.6	3.3	1.7	26.1
Sawmills and plywood	0.2	83.1	83.3		0.4	12.6		3.6	16.7
Wood products and furniture	0.0	52.2	52.2	32.6	4.4	2.6	10.9	-2.8	47.8
Petroleum and coal products	0.2	24.8	25.0	73.5	0.5	0.0		1.0	75.0
Rubber products	3.7	34.5	38.2	54.5	1.0	3.2		3.1	61.8
<u>Sub-total</u>	<u>2.3</u>	<u>46.9</u>	<u>49.2</u>	<u>42.8</u>	<u>0.8</u>	<u>3.8</u>	<u>0.3</u>	<u>3.1</u>	<u>50.8</u>
<b>C. Consumer Goods</b>									
Food products	8.9	25.2	34.1	60.2	0.2	3.4		2.1	65.9
Beverages and tobacco	6.9	21.1	28.0	71.1	0.0	0.2		0.6	72.0
Leather and products	23.3	8.8	32.1	64.5	0.2	0.2		3.0	67.9
Paper products, printing & publishing	0.6	43.3	43.9	39.1	16.0	0.6		0.4	56.1
<u>Sub-total</u>	<u>8.4</u>	<u>24.4</u>	<u>32.8</u>	<u>62.4</u>	<u>1.2</u>	<u>2.0</u>		<u>1.5</u>	<u>67.2</u>
<u>GRAND TOTAL</u>	<u>5.1</u>	<u>41.8</u>	<u>46.9</u>	<u>43.5</u>	<u>1.0</u>	<u>3.6</u>	<u>2.6</u>	<u>2.3</u>	<u>53.1</u>

Note: Figures may not total due to rounding.

Source: Input - Output Table 1963

Table 9: SIZE CHARACTERISTICS OF KOREAN MANUFACTURING /1

(Per cent Share of Small, Medium & Large Enterprises  
in Total Employment by Branch)

<u>Branch</u>	1 9 5 8			1 9 6 3		
	Small	Medium	Large	Small	Medium	Large
<u>A. Investment goods</u>						
Transport equipment	69.0	19.4	11.6	45.2	15.9	38.9
Electric machinery	67.7	8.6	23.7	35.8	29.2	35.0
Machinery	66.6	24.8	8.6	64.0	19.4	16.6
Basic metals	45.1	29.6	25.3	33.2	31.1	35.7
Metal products	72.4	25.9	1.7	72.2	19.9	7.9
Clay, glass, stone	51.9	27.7	20.4	48.4	28.4	23.2
Total Group A	59.4	25.6	15.0	47.5	26.7	25.8
<u>B. Intermediate Group</u>						
Chemicals	52.2	34.8	13.0	36.4	29.5	34.1
Paper	71.0	23.0	6.0	47.0	31.4	21.6
Textiles	39.2	23.7	37.1	28.3	22.2	49.5
Rubber	11.1	23.2	65.7	6.4	11.1	82.5
Wood and cork	79.6	10.4	10.0	59.5	9.1	31.4
Petroleum and coal products	67.3	21.9	10.8	83.8	10.8	5.4
Total group B	44.1	23.2	32.7	34.6	20.9	44.5
<u>C. Consumer Goods</u>						
Tobacco				--	8.4	91.6
Beverages	83.2	11.6	5.2	80.3	11.2	8.7
Leather	57.4	42.6	--	45.4	32.8	21.8
Food	59.5	28.0	12.5	59.5	22.6	17.9
Printing	46.2	34.1	19.7	49.0	22.1	28.9
Footwear & clothing	81.3	13.3	5.4	70.4	15.7	13.9
Furniture	88.3	11.7	--	87.0	13.0	--
Total Group C	67.1	22.6	10.3	59.0	18.0	23.0
Manufacturing	53.6	23.6	22.8	44.2	21.7	34.1

/1 Small enterprises -- 5 - 49 workers

Medium enterprises -- 50 - 199 workers

Large enterprises -- 200 - and over

Source: Calculated from the Censuses of Mining and Manufacturing, 1958 and 1963, organized by the KRB.

TABLE 10:

GAINS DERIVED BY THE MANUFACTURING SECTOR FROM THE UNDERVALUATION OF FOREIGN EXCHANGE -- 1963  
(On Imported Inputs Only)

(Estimates of the IHRD Mission)

Purchasing Sectors	PRIVATE IMPORTS				GOVERNMENT IMPORTS				Total	
	Imports (\$ thous)	Paid at	Real Value	Gain	Imports (\$ thous)	Paid at	Real Value	Gain	Gain on Imports (4+8) (million won)	Custom Duties Paid (million won) <sup>2/</sup>
		170 won/\$ (million won)	189 won/\$ (million won) <sup>1/</sup>	(3-2) (million won)		130 won/\$ (million won)	189 won/\$ (million won) <sup>1/</sup>	(7-6) (million won)		
1	2	3	4	5	6	7	8	9	10	
<b>A. Investment Goods</b>										
Transport equipment	5,330	906	1,008	102	26,093	3,392	4,932	1,549	1,611	79
Electric Machinery & appl.	9,777	1,662	1,848	186	10,516	1,367	1,988	620	806	253
Machinery	11,388	1,936	2,152	216	28,434	3,697	5,374	1,677	1,894	467
Basic metals	32,678	5,555	6,176	621	9,099	1,183	1,720	537	1,158	340
Metal products	2,993	509	566	57	3,906	508	738	230	287	92
Clay, glass and stone	5,848	994	1,105	111	2,087	271	394	123	234	86
Group A	68,014	11,562	12,855	1,293	80,135	10,418	15,146	4,727	6,020	1,317
<b>B. Intermediate Goods</b>										
Chemicals	32,935	5,599	6,225	626	51,801	6,734	9,790	3,056	3,582	1,021
Paper	1,850	315	350	35	347	45	66	21	56	65
Textiles	1,995	339	377	38	35,579	4,625	6,724	2,099	2,137	752
Rubber	598	102	113	11	319	42	60	19	30	22
Wood and cork	519	88	98	10	973	127	184	57	67	19
Petroleum and products	29,298	4,981	5,537	557	2,241	291	424	132	689	870
Group B	67,195	11,424	12,700	1,277	91,260	11,864	17,248	5,384	6,661	2,749
<b>C. Consumer Goods</b>										
Tobacco and beverages	95	17	18	1	96	13	18	6	7	0
Leather	7	1	1	0	83	11	16	5	5	1
Food	13,653	2,321	2,580	259	12,589	1,637	2,379	743	1,002	217
Printing	265	45	50	5	376	49	71	22	27	91
Group C	14,020	2,384	2,649	265	13,144	1,710	2,484	776	1,041	308
Total	149,229	25,370	28,204	2,835	184,539	23,992	34,878	10,887	13,722	4,374

<sup>1/</sup> Realistic exchange rate.<sup>2/</sup> The Commodity Tax, on imported items amounting to 2,052 million won in 1963 could be subjected to the same analysis.Ratios (a) Average custom duties  $\frac{(10)}{(2 \frac{1}{2} \times 6)} = \frac{4,374}{19,359} = 8.7\%$ (b) Loss on custom duties, due to the unrealistic exchange rate  $\frac{(10)}{(2 \frac{1}{2} \times 6)} (9) = 8.7 (13,722) = 1,194$  million won

**Note:** The above computation has been made on the basis of the detailed list of imported inputs and their destination, prepared for the Mission by the Research Department of the Bank of Korea. Although the total value of imported inputs, calculated above corresponds roughly with the value given in the input-output tables (discrepancy - 13%) there is considerable difference in the classification of inputs by industrial branches. It is therefore, difficult to establish whether gains on imports, calculated by the Mission, correspond to real gains derived by each industrial branch. It is recognized that a part of these gains accrued to traders rather than producers in the manufacturing sector.

Table 11: RESTRICTIVE MEASURES ON IMPORTS

A. Weighted Average Tariff Rates, 1964

<u>Commodity Imported</u>	<u>Weighted Average Tariff Rate (%)</u>
<u>A. Investment Goods</u>	
Transport equipment	32.9
Electric machinery	24.6
Machinery	16.5
Basic Metals:	
Ferrous metals	17.0
Non-ferrous metals	15.7
Metal products	29.3
Clay, glass, stone (non-metallic mineral mfg.)	22.4
<u>B. Intermediate Goods</u>	
Chemicals:	
Chemical elements	26.1
Mineral tar and derivatives from coal & petro.	12.6
Dyeing, tanning, coloring materials	28.8
Medicinal, pharmaceutical products	18.5
Oils, perfumes	41.8
Fertilizers	6.5
Paper	36.2
Textiles	45.2
Rubber	39.8
Wood and cork	47.9
<u>C. Consumer Goods</u>	
Food	
Dairy products, eggs	51.3
Meat and meat preparations	66.6
Fish and fish preparations	50.4
Cereal and cereal preparations	20.0
Beverages	176.4
Tobacco	139.5
<u>D. Inputs (Unprocessed)</u>	
Pulp	8.0
Crude fertilizers and minerals	5.7
Petroleum and petroleum products	11.0
Coke, coal, briquettes	10.6
Textile fiber and waste	17.1
Wood, lumber, cork	10.3
Crude rubber	11.0

Source: Prepared for the Mission by the Customs Bureau, Ministry of Finance. Weighted averages calculated by dividing the amount of custom duties collected by the value of taxed imported items in each group. These tariff rates would have been much smaller if the value of items exempted from import duties (such as investment goods and raw materials destined for important industries) were added to the denominator.

Table 11: RESTRICTIVE MEASURES ON IMPORTS

B. Commodity Taxes - 1964

	<u>Tax Rate (%)</u>
A. <u>Investment Goods</u>	
Cement	5
Aluminum and products	10
Plate glass	10
B. <u>Intermediate Goods</u>	
Textile fabrics, etc.	40
Plastics (resin and imported resin products)	40
Paper and imported paper products	2
Plywood	5
C. <u>Consumer Goods</u>	
Beverages	20
Sugar	4¢ /lbs.
D. <u>Inputs (Unprocessed)</u>	
Raw wool	45
Cotton yarn	10
Raw rubber	20
Raw silk	10
Chemical fiber	10

Source: Tariff table, Republic of Korea, 1964, p. 321.

Table 11: RESTRICTIVE MEASURES ON IMPORTS

C. Import Quotas (1965)

<u>Item</u>	<u>Amount of the quota (US\$1,000)</u>
1. Powdered milk	400
2. Raw sugar	2,400
3. Molasses	285
4. Coffee	210
5. Raw wool (unwashed)	600
6. Raw wool (washed)	700
7. Waste wool	500
8. Acrylic fiber	2,000
9. Polyester fiber	7,000
10. Staple fiber	1,461
11. Essential oil and perfumes	300
12. Fishing net yarn	870
13. Filament nylon yarn	400
<hr/>	
Total	10,826 <sup>1/</sup>
<hr/>	

<sup>1/</sup> The total is equivalent to 17% of imports paid from Korea's foreign exchange earnings (i.e. excluding foreign aid, etc.)

Source: Bank of Korea.

Table 11: RESTRICTIVE MEASURES ON IMPORTS

D. List of Prohibited Items  
July - December, 1965  
(Principal Selected Items Only)

A. Investment Goods

Transport equipment:

Pistons, brake linings, valves, clutch disks, axle shaft, engine gear, motorcycle, bicycle.

Electric machinery & appliances:

Telephone circuits, electric fans, flashlights, switches, PVC wire, electric motors (different types), transformers (different types), transistor radio, vacuum tube radio.

Machinery:

Textile weaving looms, sprayers, flour milling rollers, circular saws.

Base metals:

Lead pipes, aluminum sheets, steel tubes, galvanized iron sheets and wires.

Metal products:

Shovels, plows, nails, rivets.

Clay, glass, stone:

Asphalt tiles, color glass, tiles.

B. Intermediate Goods

Chemicals:

Zinc and potassium chloride, sulphuric acid, calcium carbonates, butylacetate. Pharmaceuticals: vitamins, penicillin, quinine, caffeine, streptomycin, and other finished pharmaceuticals and raw materials.

Paper:

Woodfree printing paper, tissue, drawing paper, manila paper board.

Textiles:

Cotton cloth and yarn, rayon cloth, woolen cloth and yarn, PVC yarn, staple fiber yarn, silk cloth.

Rubber:

Bicycle tires and tubes.

Wood and cork:

Plywood, hard board.

(Continued on next page)

Table 11

D. List of Prohibited Items (cont'd)

C. Consumer Goods

Food:

Condensed milk, beans, oils: soybean, peanut, castor, vegetable seed, cotton seed oil, oleomargarine, sesame.

Beverages:

Tea

Clothing:

Socks, stockings, underwear, knitted goods.

Source: Trade Plan for the last half of 1965, Korean Traders Association, Seoul, Korea, 1965, various pages.

Table 12: MEASURES OF IMPORT SUBSTITUTION

(percent)

	DEPENDENCE ON IMPORTED INPUTS /1 (Share of Imported Inputs in Total Material Inputs)		MARKET DEPENDENCE ON IMPORTS (Share of Imports in Total Supply) /2		
	1960	1963	1955-57	1959-61	1963-65
<b>A. Investment Goods</b>					
Transport equipment	26.0	25.0	25.6	9.3	27.3
Electrical machinery	21.2	29.9	82.0	60.9	44.3
Clay, glass, stone (including Cement)	21.2	22.0	30.8	5.4	3.5
Machinery	17.8	21.8	50.1	51.7	56.9
Basic metals (steel and primary products)	16.2	31.5	62.5	37.7	35.5
Metal products	23.6	41.0	10.8	6.6	18.1
Total Group A	20.9	30.7	42.1	30.4	32.8
<b>B. Intermediate Goods</b>					
Chemicals (including fertilizer)	25.3	34.6	83.5	63.7	48.7
Petroleum & coal prod. /3	n.a.	n.a.	n.a.	na.	n.a.
Paper and printing	29.9	28.8	32.4	13.1	2.5
Textiles	33.1	29.1	11.7	7.9	6.5
Rubber	55.2	50.3	8.7	nil	nil
Wood, cork, furniture	19.3	50.2	1.6	nil	nil
Total Group B	33.5	33.5	38.1	22.0	15.6
<b>C. Consumer Goods</b>					
Food	21.7	22.2	-	nil	nil
Beverages & tobacco	12.4	5.0	9.3	nil	nil
Leather & leather products	8.0	11.4	-	nil	nil
Total Group C	18.6	17.0			
Total manufacturing industry /4	25.4	26.2	27.9	19.0	15.4

Table 12: MEASURES OF IMPORT SUBSTITUTION

FOOTNOTES

- /1 To calculate this dependence, the value of imported inputs has been taken at the actual rate of exchange. Considering the difference between the actual and equilibrium rates of exchange, dependence on imported inputs could be adjusted upwards, in which case, it would become in 1963: For investment goods 39.1% instead of 30.7%; for intermediate goods 42.3% instead of 33.5%; for consumer goods 21.3% instead of 17.0%; for the whole of manufacturing industry dependence on input imported at the adjusted rate of exchange would increase from 26.2% to 33.3%.
- /2 Total supply = domestic output plus imports. Domestic output has been calculated as follows: Gross value of output (for 1960 and 1963) has been converted into US dollars at the equilibrium rate of exchange and interpolated for respective periods by applying to each branch separately, its index number of physical production. The only reliable output data used for the calculation were computed from the input-output tables (1960 and 1963). The market dependence on imports is therefore based upon adjusted rates of exchange applied to domestic outputs, both estimated by the Mission.
- /3 The industry contains two separate items: (i) petroleum, the market dependence on imports of which remains high until the installation of refinery in 1964, (ii) production of coal briquets, which do not depend on external supplies. It was therefore, preferred to exclude this industry altogether and to treat its problems elsewhere.
- /4 Excluding petroleum and unclassified industries, but including consumer goods industry, which brings the ratios of market dependencies downwards considering its large bulk of output and absence of imports of finished products.

Sources: Input-output Tables and Indexes of Industrial Production supplied by the Bank of Korea. Import data supplied by the Ministry of Finance and the Bank of Korea.

TABLE 13:

## EXPORT OF MANUFACTURES

SITC Code	Value in million dollars										Percent share in total exports						
	Ave. 1957-										Ave. 1957-						
	1959	1960	1961	1962	1963	1964	1965	1966 <sup>1/</sup>	1971 <sup>1/</sup>	1959	1960	1961	1962	1963	1964	1965	
(5) Chemicals	-	0.4	0.6	1.0	0.9	0.6	0.4	2.2	15.6	-	1.2	1.5	1.8	1.0	0.5	0.2	
(6) Manufactured Goods	2.6	3.9	4.0	6.2	28.1	42.3	66.4	93.3	204.8	13.5	11.9	9.8	11.3	32.4	35.5	37.9	
Rubber Manufacture	-	-	-	-	0.5	0.9	1.0	1.5	1.7	-	-	-	-	-	-	-	
Plywood and Veneer	-	-	1.2	2.3	6.3	11.4	18.0	24.0	35.0	-	-	-	-	-	-	-	
Cotton Fabrics	0.9	2.4	0.8	1.8	4.3	11.1	10.5	20.0	49.0	-	-	-	-	-	-	-	
Other Textiles	0.3	-	0.2	0.4	3.5	8.5	15.8	15.3	44.0	-	-	-	-	-	-	-	
Cement	-	-	-	-	-	0.3	0.9	5.0	4.0	-	-	-	-	-	-	-	
Iron and Steel	-	-	0.1	0.6	11.7	4.5	12.7	6.5	9.3	-	-	-	-	-	-	-	
Sheet Glass	-	-	-	-	0.3	0.8	0.4	0.9	1.7	-	-	-	-	-	-	-	
(7) Machinery Equipment	-	0.1	0.9	1.4	4.1	2.2	5.5	8.2	33.7	-	0.3	2.2	2.6	4.7	1.8	3.1	
(8) Miscellaneous	0.3	0.1	0.8	2.0	6.4	13.2	34.5	22.7	74.0	1.5	0.3	2.0	3.6	7.4	11.1	19.7	
Clothing	-	-	-	1.1	4.6	6.6	20.7	11.8	49.0	-	-	-	-	-	-	-	
Footwear	-	-	-	0.2	0.7	0.9	4.1	3.0	12.1	-	-	-	-	-	-	-	
Total Exports of Manufactures	2.9	4.5	6.3	10.6	39.5	58.3	106.8	126.4	328.1	15.0	13.7	15.5	19.3	45.5	48.9	60.9	

<sup>1/</sup> Planned (EPB).

Source: Economic Statistics Yearbooks of the Bank of Korea, Foreign Trade Statistics of the Ministry of Finance.

Table 14:

## MAJOR EXPORT MARKETS BY MAJOR EXPORT OF MANUFACTURES

Commodity	Total	Million \$ Jan.-Nov., 1965			Per cent Jan.-Nov., 1965		
		USA	Japan	Other	USA	Japan	Other
Rubber Manufacture	0.9	-	-	0.6 <sup>/1</sup>	-	-	66.7
Plywood & veneer	15.4	14.5	-	-	94.2	-	-
Cotton fabrics	9.4	2.5	-	2.3 <sup>/2</sup>	26.6	-	24.5
Iron and steel	11.5	-	-	10.0 <sup>/3</sup>	-	-	87.0
Clothing	18.3	9.9	0.2	2.9 <sup>/4</sup>	54.1	1.1	15.8
Footwear	4.0	3.5	-	-	87.5	-	-
Sheet glass	0.4	0.2	-	-	50.0	-	-
Radio	1.3	0.6	0.5	-	46.2	38.5	-

<sup>/1</sup> Thailand    <sup>/2</sup> Hongkong    <sup>/3</sup> Viet Nam    <sup>/4</sup> Sweden

Source: Ministry of Finance; Foreign Trade Statistics

Table 14a: CALCULATIONS OF PROFITABILITY OF EXPORTS OF FEW SELECTED ITEMS -- 1965  
(Estimates of IBRD Mission Material Collected Through Interviews)

Item:	PLYWOOD		SHEET GLASS		RUBBER PRODUCTS		BICYCLES			
	Unit:	(1000 sq. ft. 1/8" thickness)	(1 case-9.2m <sup>2</sup> )		Waterproof Hunting boots Pair	Automobile Tires (750-20 1 2 pr)	(1 Bicycle)			
	(\$)	(won)	(\$)	(won)	(\$)	(won)	(\$)	(won)		
<b>1. Costs of Production</b>										
Materials (raw mat, fuel, packing)		6,300		800		300		9,452		2,205
Wages		900		380		40		998		945
Depreciation		450		82				230		315
Overhead and other costs <sup>1/</sup>		1,350		516		40		2,712		2,830
Total cost of production		9,000		1,778		380		13,283		6,295
<b>2. Prices</b>										
Export Price	\$40.....	10,800	\$5.12..	1,380	\$1.50..	405	\$36...	9,720	\$14.5.	3,915
Domestic market price		9,222		1,990				13,618		7,000
<b>3. Apparent profits</b>										
Profit (+) or Loss (-) on:										
exports (won)		+1,800		-398		+25		-3,563		-1,380 <sup>2/</sup>
( % ) <sup>3/</sup>		+16.6%		- 20%		+6.2%		-26.2%		-19.7%
domestic sales (won)		+ 222		+212				+ 335		+ 705
( % ) <sup>3/</sup>		+ 2.4%		+10.6%				+ 2.5%		+ 10%
<b>4. Export incentives (\$ price x 11.3 won)</b>										
		452		57.8		16.8		403		162.4
<b>5. Shares of export in total production in 1965 = %</b>										
		75%		25%		23.8%		9.8%		2.5%
<b>6. Overhead costs (without incentives) <sup>4/</sup></b>										
		1,686		530		44		2,751		2,834
<b>7. Total cost of production (without incentives)</b>										
		9,336		1,792		384		13,332		6,299

1/ Including interest and taxes.

2/ As exported bicycles are incomplete, 1000 won worth of spare parts (based upon information collected from Bicycle Association in Korea) is subtracted from production costs.

3/ Profit or loss as percent of sales.

4/ Multiply line 4 by line 5 & add the result to "Overhead and other costs."

Source: Mission estimates.

Table 15: EARNINGS PER HOUR IN US \$ BY BRANCH OF MANUFACTURING

Industry	Korea	Taiwan	Japan
1. Food	0.08	0.17	) 0.38
2. Beverage	0.10	0.10	
3. Tobacco	-	0.11	0.64
4. Textiles	0.07	0.07	0.29
5. Wood	0.09	0.10	0.31
6. Paper products	0.10	0.10	0.44
7. Printing	0.11	0.11	0.52
8. Leather products	0.07	0.12	0.36
9. Rubber products	0.09	0.10	0.35
10. Chemicals	0.08	0.12	0.56
11. Petroleum and coal	0.08	0.13	0.66
12. Ceramics	0.09	0.15	0.43
13. Basic metal industry	0.12	0.11	0.58
14. Metal products	0.08	0.14	0.38
15. Electrical machinery	0.08	0.10	0.38
16. Transport equipment	0.09	0.16	0.53
17. Miscellaneous	0.06	0.09	0.33
Manufacturing total	0.08	0.12	0.42

Source: Calculated from the 1964 labor statistics, published by ILO, Geneva. Values in \$ established by using exchange rates from IFS, XVIII volume.

Table 16:

KCREA: VALUE-ADDED IN MANUFACTURING INDUSTRY 1960-1965 1/  
(At 1960 Constant Market Prices)

Item	Rate of Growth p.a. 1960-65	Rate of Growth From Year to Year (%)					Share in the Total of Each Item (%)					
		1961/60	1962/61	1963/62	1964/63	1965/64	1960	1961	1962	1963	1964	1965
Food	7.5	3.3	3.4	22.0	0.7	9.7	16.7	16.3	14.5	14.9	14.2	13.1
Beverages	4.9	5.7	-16.6	6.7	3.1	30.9	9.4	9.5	6.8	6.1	5.9	6.6
Tobacco	12.6	7.7	11.2	11.5	12.9	20.1	10.5	10.7	10.2	9.6	10.2	10.3
Textiles	9.7	-7.0	14.7	8.5	10.1	24.0	19.2	16.9	16.6	15.2	15.8	16.6
Footwear, other wearing apparel, etc.	5.5	-2.8	33.1	15.9	-18.7	7.1	5.1	4.7	5.4	5.3	4.0	3.6
Wood and cork products	10.7	-26.9	45.7	25.2	0.6	24.1	2.3	1.6	2.0	2.1	2.0	2.1
Furniture and fixtures	-2.7	-12.6	15.6	2.3	-19.7	5.4	1.2	1.0	1.0	0.8	0.6	0.6
Paper and paper products	22.0	23.5	40.2	38.5	2.1	7.5	2.2	2.6	3.1	3.7	3.5	3.2
Printing, publishing and allied industries	13.6	-10.4	28.8	11.6	20.3	21.9	3.7	3.1	3.5	3.3	3.7	3.8
Leather and leather products	7.5	17.4	3.7	-8.6	14.5	12.7	1.2	1.3	1.2	0.9	1.0	0.9
Rubber products	13.5	-4.8	15.8	35.6	15.5	9.1	2.4	2.2	2.1	2.4	2.7	2.4
Chemicals and chemical products	23.0	34.6	35.8	31.3	5.3	8.6	4.5	5.8	6.8	7.5	7.4	6.8
Petroleum and coal products	30.0	11.3	17.3	42.3	46.2	37.7	2.5	2.6	2.6	3.2	4.4	5.1
Stone, glass and clay products	25.0	16.1	32.0	20.3	35.3	21.4	5.0	5.5	6.3	6.4	8.1	8.3
Basic metal products	13.1	-6.6	43.1	33.4	-3.8	8.2	2.7	2.4	2.9	3.3	3.0	2.7
Metal products	12.8	14.8	15.4	18.9	-15.0	36.3	2.2	2.4	2.3	2.3	1.9	2.2
Machinery	13.2	34.3	41.8	-9.8	-7.8	17.3	3.3	4.2	5.0	3.8	3.3	3.3
Electric machinery, apparatus, appliances and supplies	33.0	51.4	53.7	33.2	31.3	2.3	0.7	1.1	1.4	1.6	2.0	1.7
Transport equipment	22.0	31.9	15.3	56.2	-16.9	37.9	3.1	3.9	3.9	5.1	4.0	4.7
Other manufacturing industries	11.4	9.6	27.0	23.9	-5.1	4.8	2.1	2.2	2.4	2.5	2.3	2.0
<u>Total</u>	<u>12.9</u>	<u>5.4</u>	<u>16.7</u>	<u>18.5</u>	<u>6.0</u>	<u>18.5</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

1/ 1965 preliminary estimates.

Source: Calculated from the National Accounts data, revised in December 1965/January 1966.

Table 17: RATE OF CAPACITY UTILIZATION (%)

	1961	1962	1963	1964	1965
		<u>Low Rate:</u> 1/			
Steel bars	34.0	41.9	53.3	22.3	9.1
Worsted yarn	45.1	32.9	n.a.	14.1	15.3
Refined sugar	26.1	21.8	16.2	7.0	16.5
Wheat flour	23.3	36.4	56.8	27.5	23.1
Bicycles	26.6	41.0	21.0	25.8	24.0
Paint	19.4	27.8	14.6	18.7	24.1
Ethyl alcohol	35.2	22.0	21.4	17.6	27.5
Pig iron	14.2	00.0	8.4	2.0	28.4
		<u>Medium Rate:</u> 1/			
Galvanized iron sheet				8.4	50.8
Steel ingots	67.7	104.5	86.4	43.7	56.6
Cotton cloth	49.8	56.4	56.5	60.8	66.5
		<u>High Rate:</u> 1/			
Rubber shoes	58.4	73.3	74.3	80.3	71.9
Motor vehicle tires	53.4	59.7	49.9	52.8	74.2
Cotton yarn	66.0	78.2	76.3	77.7	77.9
Plywood				91.2	80.0
Newsprint	90.8	98.9	78.6	80.8	84.6
Flat glass	123.9	51.8	97.6	92.6	89.8
Petroleum				43.7	92.1
Rayon cloth	84.7	93.3	66.8	73.0	93.8
Woodfree paper	84.8	88.9	87.4	94.2	96.3
Fertilizer	76.1	95.6	57.5	83.0	96.9
Cement	72.6	109.7	108.1	72.2	97.2
Nylon yarn	n.a.	n.a.	8.9	7.7	106.3

1/ Classified according to capacity utilization in 1965.

Source: Research Department, Bank of Korea.

Table 18: AVERAGE CAPITAL - OUTPUT RATIOS BY BRANCH OF MANUFACTURING

A. Estimates based on survey of fixed capital (1963)

1	2	3	4	5	6	7	8	9
Name of Industry	Number of Sample Firms	Buildings & other Construction	Machinery & Equipment	Vehicles & Other Means of Transport	Tools & Instruments	Stock Value of Fixed Assets/Gross Output	Value Added as a % of Gross output (%)	Average Capital-Output Ratios
<u>A. Investment Goods</u>								
Transport equipment	36	0.3986	0.2032	0.0334	0.0185	0.6537	32.7	2.00
Electrical machinery	30	0.1151	0.2012	0.0013	0.0196	0.3372	28.7	1.17
Machinery (except Electrical)	87	0.2750	0.3477	0.0055	0.0236	0.6518	45.3	1.44
Non-metallics:								
Cement	9	0.3786	9.4208	0.0187	0.0119	0.8300	49.0	1.69
Other ceramic, clay & Stone products	90	0.3132	0.1589	0.0066	0.0281	0.4968	41.0	1.21
Basic metals:								
Iron and steel	24	0.1439	0.1710	0.0052	0.0111	0.3312	25.1	1.32
Steel products	12	0.2253	0.1540	0.0118	0.0085	0.3996	21.1	1.89
Non-ferrous metals and primary products	8	0.0216	0.0524	0.0017	0.0018	0.0775	28.6	0.27
Finished metal products	59	0.2082	0.2531	0.0052	0.0349	0.5014	30.1	1.66
<u>B. Intermediate Goods</u>								
Petroleum & coal products	21	0.0488	0.0673	0.0094	0.0076	0.1331	17.4	0.76
Chemicals:								
Basic chemicals	21	0.1545	0.1820	0.0107	0.0235	0.3707	38.6	0.96
Intermediate chemicals	37	0.1357	0.2497	0.0071	0.0218	0.4143	28.3	1.46
Finished chemical prod.	44	0.0745	0.0837	0.0016	0.0124	0.1722	41.3	0.42
Fertilizer	3	0.0720	0.0127	0.0088	0.0100	0.1035	28.8	0.36
Paper and paper products	39	0.1674	0.2491	0.0014	0.0229	0.4308	30.8	1.40

Table 18: AVERAGE CAPITAL - OUTPUT RATIOS BY BRANCH OF MANUFACTURING (cont'd)

A. Estimates based on survey of fixed capital (1963)

1	2	3	4	5	6	7	8	9
Name of Industry	Number of Sample Firms	Buildings & other Construction	Machinery & Equipment	Vehicles & Other Means of Transport	Tools & Instruments	Stock Value of Fixed Assets/Gross Output	Value Added as a % of Gross Output (%)	Average Capital-Output Ratios
<u>Textiles:</u>								
Fiber spinning	18	0.1600	0.3284	0.0036	0.0117	0.5037	32.8	1.53
Textile fabrics	51	0.1104	0.3285	0.0004	0.0069	0.4462	21.3	2.09
Finished textile prod.	42	0.0893	0.1534	0.0003	0.0049	0.2479	27.4	0.90
Rubber products	20	0.0670	0.0994	0.0048	0.0069	0.1781	26.1	0.68
<u>Wood and cork:</u>								
Sawmills and plywood	17	0.1371	0.1736	0.0139	0.0062	0.3308	29.9	1.10
Wood prod. & furniture	27	0.5978	0.3089	0.2629	0.0211	0.5978	31.3	1.91
<u>C. Consumer Goods</u>								
Processed foods	86	0.2679	0.3328	0.0093	0.0281	0.6381	25.6	2.49
Beverages and tobacco	35	0.1348	0.0532	0.0000	0.0247	0.2127	49.8	0.43
Printing & publishing	47	0.2252	0.2079	0.0038	0.0146	0.4515	43.3	1.04
Leather & leather products	37	0.1503	0.1533	0.0010	0.0113	0.3159	27.5	1.15

Source: Coefficients calculated by Industrial Management Research Center, Yonsei University on the basis of survey data, collected in May 1964, by the Research Department, Bank of Korea. Share of value added in gross output and capital/output ratios estimated by the IPRD Mission on the basis of input-output tables for 1963.

Note: Implicit stock figures, derived from the above sub-branch capital coefficients are close to those obtained by applying the implicit 1955-63 net ICOR of 1.45 to the 1963 outputs. The difference of results obtained by those two methods, is only 1.3%.

Table 18: AVERAGE CAPITAL-OUTPUT RATIOS BY BRANCH OF MANUFACTURING

B. Estimates based on financial statements

	Average Capital - Output Ratio /1		
	1962	1963	1964
<u>A. Investment Goods</u>			
Transport equipment	1.10	2.12	2.24
Electric machinery	n.a.	1.53	1.09
Clay, glass, stone	1.65	2.03	2.52
Machinery	n.a.	1.53	1.09
Basic metals	1.17	1.63	1.47
Metal products	n.a.	1.11	1.20
<u>B. Intermediate Goods</u>			
Petroleum and coal products	0.74	0.82	2.20
Chemicals	1.04	0.72	1.19
Paper	1.97	1.88	1.47
Textiles	1.35	1.67	1.20
Rubber	0.71	0.87	0.80
Wood and cork	0.50	1.53	0.57
<u>C. Consumer Goods</u>			
Processed food	1.25	0.89	1.42
Beverages	0.75	1.01	0.61
Leather & leather products	1.46	2.06	1.79
Footwear and clothing	0.77	0.44	1.06
Furniture	1.71	1.42	2.10
Printing	0.99	0.78	1.02
Total Manufacturing	<u>1.17</u>	<u>1.47</u>	<u>1.51</u>

/1 Fixed assets/value added, both calculated in current prices. Coefficients computed by taking the inverse of the ratio of value added to tangible fixed assets.

Source: Analysis of financial statements, 1964, Research Department, BOK, p. T6.

Table 19:

## ROLE OF MANUFACTURING IN ASIAN COUNTRIES

Item	Korea 1960-65 / <u>2</u>	Taiwan 1959-63 / <u>3</u>	Philippines 1959-63
Share of Manufacturing in GNP (%)	15.6	19.9	15.9 / <u>2</u>
Share of manufacturing in total investment (%)	20.3	23.2	25.2 / <u>3</u>
ICOR / <u>1</u> in manufacturing (ratio)	1.35	1.21	1.47 / <u>3</u>
Share of Agriculture in GNP (%)	34.4	29.8	32.9 / <u>2</u>
Share of agriculture in total investment (%)	9.5	18.4	6.2 / <u>3</u>
ICOR / <u>1</u> in all sectors excluding manufacturing (ratio)	2.45	1.55	1.77 / <u>3</u>
ICOR / <u>1</u> in all sectors (ratio)	1.97 / <u>4</u>	1.72	1.22 / <u>3</u>

/1 Fixed investment per unit of value-added; one year lag.

/2 Constant prices.

/3 Current prices.

/4 Fixed capital formation to increase in the GDP. If related to increase in GNP, the coefficient becomes somewhat lower.

Source: Calculated from various issues of the Yearbook of National Accounts, United Nations.

Table 20: LABOR PRODUCTIVITY

(Thousands of won per worker)

Item	1960	1962	1963	1964
Food	196.5	195.8	199.5	206.0
Beverages	204.9	157.0	182.1	183.2
Tobacco	n.a.	n.a.	n.a.	n.a.
Textiles	77.3	61.4	66.8	83.1
Footwear, other wearing apparel, etc.	113.2	133.0	146.9	112.9
Wood and cork products	63.9	79.4	83.8	86.4
Furniture and fixtures	81.3	77.2	73.1	61.0
Paper and paper products	93.0	115.7	158.8	146.3
Printing, publishing & allied industries	99.0	94.9	96.2	107.2
Leather and leather products	416.0	216.4	241.7	237.1
Rubber products	72.0	54.1	61.7	75.7
Chemicals and chemical products	116.1	139.0	139.3	164.5
Petroleum and coal products	86.3	70.9	103.0	159.1
Stone, glass and clay products	99.8	115.4	128.9	185.3
Basic metal products	127.4	93.1	120.5	123.4
Metal products	65.5	76.9	75.0	62.5
Machinery	111.8	151.4	127.1	108.2
Electric machinery apparatus, surplus appliances	54.9	66.1	74.3	95.8
Transport equipment	109.1	107.9	123.1	106.8
Other manufacturing industries	114.0	103.6	101.6	113.4
<u>Total</u>	<u>119.8</u>	<u>112.2</u>	<u>122.2</u>	<u>135.1</u>

Sources: Value added in manufacturing industry (at 1960 constant market prices) obtained from revised National Accounts prepared by Research Department of the BOK. Employment data obtained from the Sample Survey conducted by the KRB. (There is a substantial difference between total employment in manufacturing, according to KRB (377,000 in 1964) and according to The Survey of the Economically Active Population (670,000 in 1964) conducted by EPB.)

Table 21: RELATIONS BETWEEN WAGES, PRODUCTIVITY  
AND PRIVATE CONSUMPTION EXPENDITURES

	1957	1960	1965	Increases p.a.		
				1957/60	1957/65	1960/65
<u>In Current Prices:</u>						
1. Average monthly wages manufacturing (won)	2,030	2,600	5,000 <sup>1/</sup>	8.6	12.0	14.0
2. GNP (billion won)	199.3	243.4	779.4	6.9	18.6	26.0
3. Private Consumption expenditures (billion won)	157.6	202.5	669.6	6.5	18.9	27.0
<u>On Constant 1960 Prices</u>						
4. Deflator: Seoul consumer price index (1960 = 100)	92.9	100.0	204.4	2.3	10.4	15.4
5. Real annual wages per worker in manufacturing (thousand won)	26.2	31.2	29.3	6.0	1.4	- 1.0
6. GNP (billion won)	219.1	243.1	341.3	3.5	5.7	7.0
7. Private consumption expenditures (billion won)	182.9	202.5	281.0	3.4	5.5	6.8
8. Labor productivity (value added per worker in the manufacturing sector - in thousand won)	n.a.	70.6 <sup>2/</sup>	79.3 <sup>3/</sup>	n.a.	n.a.	3.0 <sup>4/</sup>

<sup>1/</sup> October 1965

<sup>2/</sup> Average 1959-61

<sup>3/</sup> Average 1963-65

<sup>4/</sup> 1959-61 to 1963-65

Sources: Mission's estimates, BOK, EPB and KRB surveys and censuses.

Table 22:      PRODUCTIVE EQUIPMENT IN MANUFACTURING  
CALCULATED IN HORSEPOWER (HP)

	Total		Per Worker	
	1958	1963	1958	1963
Manufacturing total	384.3	936.6	1.4758	2.3298
Food	79.8	118.8	3.1050	3.3184
Beverage	12.0	12.6	0.8163	0.7826
Tobacco		5.0		0.6250
Textiles	79.4	110.1	0.9168	1.0054
Footwear & clothing	1.4	107.2	0.1238	6.2325
Wood & cork	25.0	31.1	2.1551	2.5702
Furniture	.96	2.9	0.3000	0.5370
Paper	44.3	43.4	2.7500	3.9099
Printing	5.9	5.8	0.4469	0.3558
Leather	1.6	3.6	1.8390	2.0000
Rubber	23.9	26.0	2.2129	1.3684
Chemicals	13.8	181.9	1.2660	7.0503
Petroleum	8.0	25.7	1.2500	1.7364
Clay, glass & stone	41.7	57.3	2.1832	2.4177
Basic metals	28.4	55.5	3.6410	4.2045
Metal manufacture	10.7	18.2	1.3896	1.2133
Machinery	8.5	24.5	1.1038	1.6896
Electric machinery	1.8	17.0	0.8181	1.6504
Transport equipment	13.9	69.7	1.4946	3.4850
Miscellaneous	13.2	20.1	2.0625	1.6750

Source: Calculated from 1958, 1960 and 1963 Industrial Censuses.

**Table 23:** GROWTH RATES IN EMPLOYMENT  
BY MANUFACTURING BRANCHES

(percent per year)

	1955-63	1960-64
Manufacturing total	7.8	8.1
Food	5.8	5.7
Beverage	3.2	2.1
Tobacco	n.a.	n.a.
Textiles	3.0	3.1
Footwear and clothing	13.8	5.1
Wood	2.5	-0.99
Furniture	24.0	2.6
Paper	11.6	11.7
Printing	6.7	9.4
Leather	8.4	23.0
Rubber	4.1	13.2
Chemicals	16.3	15.6
Petroleum	29.0	10.2
Glass, clay and stone	5.4	7.6
Basic metals	11.8	15.4
Metal products	13.9	8.9
Machinery	13.2	13.1
Electric machinery	31.0	23.0
Transport equipment	13.6	20.0
Miscellaneous	15.1	13.3

Source: Growth rates for 1955-63 calculated from respective Industrial Censuses (for 1955 and 1963). Growth rates for 1960-64 calculated from the sample surveys conducted by the KRB.

Table 24: SHARE OF WAGES IN TOTAL PRODUCTION COST

	1960	1962	1963	1964
Manufacturing total	22.05	17.94	19.19	16.04
Food	9.74	10.58	9.28	14.92
Beverage	14.64	12.17	13.61	13.30
Tobacco	-	-	-	-
Textiles	22.09	17.78	20.06	15.17
Footwear and clothing	23.64	13.34	29.02	
Wood	14.35	13.53	11.69	
Furniture	51.15	31.78	33.33	
Paper	25.88	11.63	13.95	17.24
Printing	74.02	49.27	47.32	36.63
Leather	8.89	8.51	14.80	9.89
Rubber	16.67	13.77	18.83	12.84
Chemicals	19.88	15.78	16.85	10.78
Petroleum	16.07	14.24	10.67	11.01
Clay, glass and stone	52.95	27.52	39.05	33.67
Basic metals	22.44	11.27	10.19	9.83
Metal products	27.92	34.29	22.93	17.76
Machinery	59.39	52.05	40.80	24.43
Electric machinery	29.89	32.16	18.41	14.27
Transport equipment	81.04	56.28	36.99	35.57
Miscellaneous	34.05	24.40	21.06	18.05

Source: Wages calculated by multiplying employment (KRB Sample Survey) by wages per worker (BOK Monthly Statistical Bulletin).  
Production costs calculated by subtracting value added from gross output (KRB sample survey).

Table 25:

STRUCTURE OF DEVELOPMENT FINANCES IN KOREAN INDUSTRY  
A. 1963

	Percent Composition of Outstanding Bank Loans		Percent Composition of Internal and External Financing Sources								
	Working Capital	Fixed Capital	Internal Sources			External Sources					
			Retained Profit	Depreciation	Sub-Total	Short Term	Long Term	Trade Creditors	Stocks	Others	Sub-Total
<b>A. Investment Goods</b>											
Transport Equipment	57.6	42.4	4.4	1.6	6.0	7.9	15.2	3.3	55.2	12.4	94.0
Electric Machinery	69.2	30.8	7.4	5.7	13.1	6.4	14.9	3.9	48.3	13.4	86.9
Clay, Glass & Stone Machinery	47.4	52.6	4.1	4.0	8.1	15.2	15.4	3.8	32.9	24.5	91.9
Basic Metals	76.1	23.9	7.1	2.8	9.9	10.9	14.4	8.7	30.1	26.0	90.9
Metal Products	54.7	45.3	6.9	1.2	8.1	6.5	15.8	3.8	31.3	34.6	91.9
	77.0	23.0	8.2	2.2	10.4	15.6	10.2	4.6	31.6	27.6	89.6
Group A	60.6	39.4			10.3						89.7
<b>B. Intermediate Goods</b>											
Petroleum	98.0	2.0	10.9	1.9	12.8	14.3	2.8	7.3	2.5	60.3	87.1
Chemicals	34.5	65.5	14.6	4.8	19.4	5.7	3.2	1.8	27.5	42.4	80.6
Paper	58.0	42.0	3.7	2.6	6.3	19.4	15.5	3.3	35.9	19.5	93.7
Textiles	70.5	29.5	9.0	4.2	13.2	15.2	8.5	1.8	31.1	30.6	86.8
Rubber	87.8	12.2	9.6	2.2	11.8	17.7	2.8	8.0	34.9	24.7	88.1
Wood and Cork	85.8	14.2	9.5	2.7	12.2	23.1	6.9	4.4	36.0	17.3	87.8
Group B	61.0	39.0			13.2						86.8
<b>C. Consumer Goods</b>											
Processed Food	67.0	33.0	6.4	2.9	9.3	20.4	6.5	4.5	30.1	29.1	90.7
Beverages	80.5	9.5	12.8	2.5	15.2	13.6	9.6	10.1	24.7	26.8	84.8
Leather	84.2	15.8	9.8	2.1	11.9	37.8	20.2	3.0	13.4	13.8	88.1
Footwear & Clothing	87.5	12.5	7.3	0.4	7.7	10.6	5.4	5.0	39.4	31.9	92.2
Furniture	97.6	2.4	5.4	2.0	7.4	11.0	14.2	8.4	38.2	20.7	92.6
Group C	75.2	24.8			11.0						89.0
Total Manufacturing	62.9	37.1			12.2						87.8

Table 25:

## STRUCTURE OF DEVELOPMENT FINANCES IN KOREAN INDUSTRY

B. 1964

	Percent Composition of Outstanding Bank Loans		Percent Composition of Internal and External Financing Sources								
			Internal Sources			External Sources					
	Working Capital	Fixed Capital	Retained Profit	Depre- ciation	Sub- Total	Short Term	Long Term	Trade Creditors	Stocks	Others	Sub- Total
<b>A. Investment Goods</b>											
Transport Equipment	59.2	40.8	3.8	3.2	7.0	10.3	14.6	7.7	46.3	14.0	93.0
Electric Machinery	74.5	25.5	4.5	2.2	6.7	6.1	41.4	8.3	26.4	10.5	93.3
Clay, Glass & Stone Machinery	61.4	38.6	1.0	5.8	6.8	8.0	27.2	3.2	23.3	31.4	93.2
Basoc Metals	74.8	25.2	7.9	3.0	10.9	19.0	12.1	2.8	29.6	25.4	89.1
Metal Products	50.0	50.0	11.3	2.0	13.2	10.7	10.8	3.8	36.9	24.5	86.7
	74.7	25.3	10.0	1.7	11.7	17.5	2.7	7.2	36.3	24.5	88.3
Group A	74.3	35.7			7.9						82.1
<b>B. Intermediate Goods</b>											
Petroleum	97.3	2.7	21.9	7.3	29.2	0.3	22.0	0.5	31.9	16.1	70.8
Chemicals	34.5	65.5	7.8	6.5	14.3	6.8	27.2	2.8	39.4	9.6	85.7
Paper	74.8	35.2	7.4	3.1	10.5	24.1	9.1	3.1	34.6	18.6	89.5
Textiles	72.6	27.4	10.3	4.0	14.3	24.9	6.0	3.3	31.9	19.8	85.7
Rubber	87.3	12.7	7.0	1.5	8.5	25.0	3.6	13.8	24.0	24.9	91.5
Wood and Cork	86.5	13.5	7.6	1.2	8.8	19.4	1.7	9.1	25.6	35.4	91.2
Group B	63.4	36.6			16.0						84.0
<b>C. Consumer Goods</b>											
Processed Food	67.7	32.3	8.8	3.0	11.8	15.9	2.5	7.3	30.8	31.6	88.2
Beverages	90.2	9.8	7.1	1.3	8.4	14.0	9.4	23.3	15.8	29.0	91.6
Leather	87.0	13.0	10.4	1.6	12.0	13.9	22.1	6.7	24.0	21.3	88.0
Footwear & Clothing	88.3	11.7	7.3	1.5	8.8	13.2	6.7	19.5	39.5	12.3	91.2
Furniture	98.4	1.6	7.5	2.8	10.3	25.7	22.4	6.5	29.6	5.4	89.7
Group C	75.8	24.2			10.5						89.5
Total Manufacturing	65.6	34.4	9.1	4.3	13.4	14.2	14.9	5.1	31.5	20.9	86.6

Source: Composition of Bank loans calculated from Economic Statistics Yearbook for 1965 (BOK) pp.78-84; composition of internal and external financing sources calculated from Sources of Funds Statements, prepared by the Research Department of the Bank of Korea.

Table 26:

## KOREAN RECONSTRUCTION BANK FINANCING OF MANUFACTURING SECTOR

Industries	Production			Liabilities <sup>/1</sup>	Profits Rate		Interest Rate	Total Rate of Return	
	Output of KRB Clients as % of Total Output			Ratio of Liabilities to Gross Capital (5)	Net Profit/ Net Worth (%)		Rate of Interest Effectively Paid on Loan Capital(%)	Profit + Interest Total Assets (%)	
	1962	1963	1964	1963	1963	1964	1963	1964	1964
<b>A. Investment Goods</b>									
Transport Equipment	44.1	46.3	47.1	49.0	3.9	13.8	5.6		8.6
Electrical machinery	32.2	56.3	87.5	51.4	8.5	16.2	7.9		11.7
Clay, glass & stone	39.5	41.7	52.8	56.9	11.8	16.8	16.0		16.6
Machinery	33.4	30.4	26.5	33.9	nil	22.0	n.a.		n.a.
Basic metals	36.3	54.8	51.2	52.2	27.1	12.5	1.0		4.4
Metal products	10.9	13.8	17.0	51.9	7.8	19.0	3.8		13.0
<b>B. Intermediate Goods</b>									
Petroleum & coal products	7.5	7.6	2.6		n.a.	n.a.	n.a.		n.a.
Chemicals	41.0	20.4	54.2	32.8	17.9	10.4	4.3		7.7
Paper	81.7	87.9	93.1	51.6	21.4	12.3	28.1		13.9
Textiles	49.5	55.5	68.7	48.6	13.7	13.0	9.9		12.5
Rubber	52.6	48.8	48.4	64.1	24.0	23.9	5.6		13.2
Wood and cork	10.6	14.0	40.5	51.7	15.3	36.0	5.3		21.4
<b>C. Consumer Goods</b>									
Processed Food	30.5	33.6	41.9	41.6	28.1	14.0	12.3		13.1
Beverages	11.5	16.4	28.3	57.3	21.4	36.8	5.9		17.2
Leather	43.7	47.7	53.2	50.8	11.4	13.4	n.a.		
Footwear & clothing	2.3	1.0	2.0	46.9	6.0	10.8	4.2		
Furniture	2.4	1.5	0.6	71.1	16.7	6.1	n.a.		7.7
<b>Total Manufacturing</b>	<u>30.5</u>	<u>33.6</u>	<u>41.9</u>	<u>49.4</u>	<u>15.5</u>	<u>15.0</u>	<u>10.2</u>		<u>12.6</u>

<sup>/1</sup> Of the enterprises financed by the Korean Reconstruction Bank

Source: Calculated from data supplied by the Korean Reconstruction Bank.



Table 27: PERCENT DISTRIBUTION OF SALES, PROFIT, LOANS, DEPRECIATION AND TAXES BY BRANCH  
(in current market prices)

FOOTNOTE

1/ All banks; (Commercial Banks, Korean Reconstruction Bank, Medium Industry Bank).

Source: Gross output for 1963 calculated from input-output tables for 1964 extrapolated by using the physical index of production. Price increases inferred from National Accounts. Net profit rates, depreciation and taxes derived from the Analysis of Financial Statements for 1964 (Research Department, Bank of Korea, p.77-87) and applied to revised value added (National Accounts) to obtain absolute money values. Outstanding Bank loans calculated from the Economic Statistics Yearbook for 1965 (BOK) p. 78-84.

Table 28:

KOREAN RECONSTRUCTION BANK:

INTEREST RATES ON LOANS (PER ANNUM)

	<u>Before Oct.1965</u>	<u>After Oct.1965</u>	<u>Increased By</u>
1. Loans:			
a. Capital Loans:			
Housing Loans <u>/1</u>	4%	4%	- <u>/1</u>
"Basic" Industry Loans <u>/2</u>	6%	7.5%	25%
Loans under 2 years	10%	16%	60%
Between 2 to 5 years	9%	11%	22%
Over 5 years	8%	10%	25%
AID DL A-007 Subloans <u>/3</u>	8%	8%	-
b. Operational Loans	10%	18%	80%
2. Overdue (total charges on loans)	1.46% <u>/4</u>	36.5%	319% to 668%
3. Guarantee fees on Foreign loans	0.1% to <u>5/</u> 0.75%	0.1 to <u>/5</u> 0.75%	
4. Interest Rates Paid by KRB on Deposits and Loans			
AID Counterpart Funds	2%	2%	-
Other Government Funds	2- 5%	2- 5%	=
AID Dollar Loan (A-007)	5%	5%	-
Industrial Finance Debentures	5%	5%	-
Time Deposits	9-15%	18-30% <u>/6</u>	100%
Control Account Deposits	1.8%	1.8%	-

/1 Not increased because of social considerations.

/2 Electricity, coal mining, shipbuilding, marine transportation, public works and waterworks.

/3 These loans being tied to the dollar provide a hedge against inflation. The rate is stipulated in the loan agreement.

/4 In addition to regular interest rates.

/5 Declining from 0.75% for small amounts to 0.1 for large amounts.

/6 Except for the Government-controlled corporations, for which the rates were set between 6 to 10%.

TABLE 29: FINANCIAL POSITION AND FINANCING OF GOVERNMENT-OWNED INDUSTRIAL ENTERPRISES

	O u t p u t		P r o f i t s			F i n a n c e s					
	Share in the Total of Respective Branches (%)		Net Profits to Total Sales (%)			1963 (Million won)		1964 (Million won)		1965 (Million won)	
	1963	1964	1963	1964	1965	Net Profits	Out- standing KRB loans	Net Profits	Out- standing KRB loans	Net Profits	Out- standin KRB loan
Inchon Heavy Industrial Corporation	n.a.	n.a.	6.4	12.9	5.4	108	256	275	204	143	160
Hankuk Machine Industrial Corporation	7.1	11.8	7.9	2.9	3.7	22	57	22	152	43	150
Korea Shipbuilding and Engineering Corp.	15.9	21.3	4.9	6.2	7.0	30	186	59	298	130	287
Korea Oil Refinery Corp.	-	66.3		5.3	14.6			380 <u>1/</u>		394 <u>1/</u>	
Chung-ju Fertilizer Co. Ltd.	11.7	19.2	11.5	-4.6	-60.2	143	2,688	-60	2,190	-793	2,192
Honau Fertilizer Co. Ltd.				-7.8	-45.6	-	532	-60	785	-549	742
						303	3,719	236	3,629	-1,026	3,531

1/ Not included in the totals of respective column.

Sources: Calculated from data supplied by the KRB and the Ministry of Finance.

Table 30. LINES OF EXPANSION IN MANUFACTURING

(1965 prices)

Branch	Growth Rate per Year		Composition of Value Added			Composition of Net Fixed Investment 1966-71
	1955-57 to 1963 - 65 <sup>3)</sup>	1965-71	1965	1971		
				Mission (percentages)	Normal <sup>1/</sup>	
<u>A. Investment Goods</u>	<u>13.9</u>	<u>14.4</u>	<u>18.6</u>	<u>23.7</u>	<u>27.7</u>	<u>39.5</u>
Transport Equipment	13.8	10.5	3.8	3.9	)	6.6
Electrical Machinery	30.0	18.6	1.6	2.5	)	2.7
Machinery	2.1	16.0	2.5	3.5	)	8.8
Metal Products	12.0	5.0	1.6	1.2	)	-
Basic Metals	14.2	14.4	3.6	4.6	4.8	13.7
Non-Metallic minerals	16.0	16.9	5.5	8.0	8.0	7.7
<u>B. Intermediate Goods</u>	<u>11.4</u>	<u>10.7</u>	<u>44.8</u>	<u>47.0</u>	<u>30.2</u>	<u>57.7</u>
Paper	19.0	11.0	2.4	2.6	1.5	2.9
Textiles	6.2	8.2	25.4	23.2	14.5	16.6
Rubber	11.3	8.4	2.4	2.2	0.9	-
Wood	6.1	4.8	3.3	2.5	4.2	0.6
Chemicals	23.0	20.0	7.5	12.8	)	34.0
Petroleum & coal Products	40.0 <sup>4)</sup>	9.9	3.7	3.7	)	3.5
<u>C. Consumer Goods</u>	<u>6.6</u>	<u>5.9</u>	<u>35.5<sup>2)</sup></u>	<u>28.5<sup>2)</sup></u>	<u>38.9<sup>2)</sup></u>	<u>2.8</u>
Food	5.1	5.8	12.1	9.6	)	1.6
Beverages	6.1	4.8	6.7	5.1	)	-
Tobacco	7.1	5.8	6.3	5.1	)	-
Clothing	n.a.	8.0	4.1	3.6	5.4	1.2
Printing & Publishing	13.0	7.0	4.9	4.2	2.2	-
<u>Total Manufacturing</u>	<u>11.0<sup>5)</sup></u>	<u>9.9</u>	<u>100.0<sup>6)</sup></u>	<u>100.0<sup>6)</sup></u>	<u>100.0<sup>6)</sup></u>	<u>100.0</u>
Total Manufacturing (billion won)			(153.0)	(268.8)		(183.0) <sup>7)</sup>

<sup>1/</sup> See paragraph 13, Chapter II.<sup>2/</sup> Including leather, furniture etc.<sup>3/</sup> Based on BOK Index Numbers.<sup>4/</sup> 1959/61 to 1963/65.<sup>5/</sup> Corresponds to growth rate of value added of 9.4 percent per year.<sup>6/</sup> Including miscellaneous industries not listed on the table.<sup>7/</sup> Gros investment estimated as 252 billion won.

Source: Mission estimates.

INDEX NUMBER OF INDUSTRIAL PRODUCTION

	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Food	56.7	81.0	86.9	102.9	95.2	100.0	109.9	105.7	115.0	84.2	97.7
Beverage	65.7	76.2	69.2	79.5	94.5	100.0	105.1	99.2	90.0	94.4	125.4
Tobacco	88.0	88.7	91.2	98.2	101.5	100.0	108.6	121.2	134.6	148.5	176.6
Textiles	67.8	79.2	96.5	99.5	103.2	100.0	91.2	105.6	109.7	127.0	155.3
Wood and cork	72.4	80.1	89.8	96.2	99.6	100.0	93.5	111.5	132.6	108.7	127.9
Paper & Paper Products	41.0	46.4	49.7	56.9	76.7	100.0	122.3	145.4	176.8	178.1	189.1
Printing & Publishing	48.8	54.2	57.9	80.3	86.5	100.0	80.9	99.7	106.2	131.9	176.6
Leather & its products	103.6	133.8	128.2	155.8	113.9	100.0	123.0	126.2	114.0	130.6	142.9
Rubber products	45.7	45.4	61.7	66.9	104.0	100.0	94.7	99.9	117.2	135.8	135.8
Chemicals	35.2	40.1	38.9	47.8	74.5	100.0	120.2	142.1	177.1	182.4	205.0
Petroleum & coal products	-	-	-	-	-	100.0	137.3	160.9	178.0	257.9	389.9
Glass, clay & stone prod.	43.8	59.2	67.1	88.2	97.6	100.0	99.8	130.6	140.0	193.8	222.8
Basic metal	29.7	45.3	53.7	65.7	89.3	100.0	85.6	119.2	134.4	155.7	127.4
Metal products	42.7	63.7	93.4	89.8	92.5	100.0	107.7	134.1	178.4	111.3	159.9
Machinery	115.9	165.8	136.1	143.3	134.1	100.0	145.9	199.7	147.3	134.7	150.9
Electrical machinery	21.6	52.8	59.8	79.9	111.3	100.0	134.9	248.8	325.0	361.6	346.5
Transport equipment	105.2	115.6	144.7	113.1	79.4	100.0	146.8	148.2	275.6	286.4	422.5
Miscellaneous	89.9	98.4	102.7	99.4	105.2	100.0	101.2	144.0	188.2	153.3	158.7
Manufacturing	29.8	38.6	52.2	54.7	76.1	100.0	113.4	134.6	153.6	169.1	175.0

Source: Bank of Korea, Research Department

PROFIT MARGINS IN MANUFACTURING

	Gross Profit Margin on Sales (%) /1				Net Profit Margin on Sales (%) /2	
	1960	1962	1963	1964	1960	1963
Total manufacturing	26.00	24.01	24.11	24.22	11.63	12.07
Food	20.06	22.08	22.85	22.81	19.22	13.16
Beverage	36.22	40.94	38.95	42.14	5.10	6.60
Tobacco	-	-	-	-	Excluded	Excluded
Textiles	23.68	16.97	21.13	19.65	9.28	9.66
Footwear & clothing	24.08	27.27	23.48	n.a.	10.39	12.91
Wood	25.16	30.07	21.41	n.a.	)	)
Furniture	24.17	17.71	22.31	n.a.	) 7.09	) 13.48
Paper	31.11	20.75	29.61	24.72	)	)
Printing	25.36	23.65	29.62	30.63	) 12.42	) 14.36
Leather	14.66	14.92	13.58	3.96	10.52	10.89
Rubber	26.72	21.86	16.82	16.69	5.38	10.01
Chemicals	24.95	31.60	31.69	26.05	13.03	15.77
Petroleum	18.48	22.23	14.40	34.27	7.08	8.55
Clay, glass & stone	42.20	35.08	34.90	39.00	16.32	20.38
Basic metals	17.81	16.84	15.76	9.97	)	)
Metal products	26.86	13.48	22.55	10.73	) 6.61	) 11.06
Machinery	29.73	16.44	22.81	24.91	15.51	24.36
Electrical machinery	26.01	25.74	25.53	21.20	8.95	11.31
Transport equipment	31.05	25.05	15.43	14.29	11.85	10.03
Miscellaneous	28.17	17.61	23.33	20.21	22.88	10.14

Sources and methods:

/1 Gross profit margin on sales:

Value added and gross output (sales) were derived from the sample survey conducted by the KRB (Conditions of Mining and Manufacturing). Wages have been calculated by multiplying the number of workers (derived from the above sample by monthly wages calculated by the BOK Monthly Statistical Review) and subtracted from value added to obtain gross profits.

/2 Net profit margin on sales:

Calculated from input-output tables for 1960 and 1963. Capital consumption allowances, indirect taxes and compensation of employees have been subtracted from the value added.

Remark: Considering the diversity of statistical sources utilized in the calculation, above data cannot be considered as absolutely definite or accurate.

EXPORTS OF DEVELOPING COUNTRIES - MILLION \$

	1953	1954	1955	1953-55	1962	1963	1964	1962-64
1. Total to all regions	20410	21430	22880	21571	27100	29540	32040	29560
2. Chemicals "	190	200	210	200	330	360	370	353
3. Machinery "	110	110	120	313	260	280	290	276
4. Other Mfg. "	2150	2250	2620	2340	3500	4010	4390	3966
5. Mfg. Exports " (2,3&4)								
6. Total to developed areas	15300	16100	17080	16160	20760	22930	24980	22890
7. Chemicals "	120	130	130	127	190	180	190	187
8. Machinery "	30	30	30	30	70	70	80	73
9. Other mfg. "	1380	1500	1820	1567	2560	2970	3300	2943
10. Mfg. Exports " (7, 8&9)	1530	1660	1980	1723	2720	3220	3570	3170
11. Textiles and clothing to Developed Areas Volume 1958 -- 100	55	70	75		175	198	222	

Source: UN Monthly Bulletin of Statistics, Nov. 1965.

## SIZE CHARACTERISTICS OF KOREAN MANUFACTURING

	1963						1958					
	Small		Medium		Large		Small		Medium		Large	
	Enterprises		Enterprises		Enterprises		Enterprises		Enterprises		Enterprises	
	4 - 49		50 - 199		above 200		4 - 49		50 - 199		above 200	
	Value	Value										
	Workers	Added										
(%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Food	11.74	11.74	9.48	11.41	4.73	5.78	10.87	10.70	11.54	10.79	5.50	7.39
Beverage	7.17	14.47	2.11	10.97	1.04	4.81	8.66	14.99	2.72	8.79	1.21	6.32
Tobacco	-	-	.82	.37	5.84	28.68	-	-	-	-	-	-
Textiles	17.03	10.53	28.45	14.65	40.08	23.10	24.15	15.49	32.85	23.89	55.33	45.54
Footwear & clothing	6.67	5.88	3.16	1.51	1.77	0.48	6.53	8.05	2.40	1.80	1.03	0.25
Wood & cork	3.97	4.60	1.29	1.72	2.81	3.32	6.53	6.55	1.92	2.56	2.06	1.44
Furniture	2.54	1.68	.82	.88	-	-	1.99	1.83	0.48	0.33	-	-
Paper	2.92	2.85	4.10	5.73	1.77	3.32	2.63	1.51	1.92	2.34	0.51	2.04
Printing	4.35	5.37	4.22	4.47	3.47	3.33	4.33	4.17	7.21	6.78	4.47	4.97
Leather	0.44	0.42	0.70	.66	0.29	0.04	0.36	0.71	0.48	1.28	-	-
Rubber	0.72	0.64	2.46	1.45	11.53	5.22	0.85	6.70	4.01	3.43	12.03	8.43
Chemicals	5.18	8.15	8.90	15.62	6.50	7.96	4.05	6.58	6.09	5.80	2.58	3.82
Petroleum	6.84	5.80	1.87	2.11	0.60	.27	3.05	3.92	2.44	2.13	1.20	0.35
Glass, clay & stone	6.34	6.22	7.84	6.03	4.07	6.00	7.03	4.56	8.49	7.43	6.63	14.49
Basic metals	2.43	3.08	4.80	7.91	3.48	1.80	2.49	3.50	3.68	7.25	3.44	2.86
Metal manufacturing	5.90	4.98	3.51	2.14	0.88	0.73	3.97	3.82	3.21	3.11	0.34	0.13
Machinery	5.13	4.57	3.29	2.22	1.77	0.78	3.62	3.89	3.04	4.17	1.03	0.65
Electrical machinery	2.04	2.87	3.51	3.81	2.66	1.43	1.06	1.86	0.80	2.02	0.34	0.09
Transport equipment	4.96	4.08	3.75	3.37	5.76	2.61	4.54	4.85	2.88	3.38	1.89	1.11
Miscellaneous	3.53	2.71	5.27	2.97	0.81	0.37	2.69	2.92	3.84	3.38	0.34	0.06

Source: Calculated from the 1958 and 1963 industrial censuses. Shares of value added established from data in current prices.

COMPARISON OF WHOLESALE PRICES OF MAJOR COMMODITIES

				(as of Oct., 1965)
	Unit	Korea	Japan	United States
	<u>Dollars</u>			
Cotton yarn	400 lb.	209.9	153.9	256.8
Rayon yarn	200 lb.	180.4	51.7	56.0
Cement	1 ton	19.5	16.5	
Ammonium sulphate	1 ton	56.1	50.1	
Coal dust	1 ton	5.5	13.4	4.79 (screening, industrial use)
Gasoline	1 kl.	71.1	111.6	
Copper ingots	1 ton	1,116	919.4	809.0
Galvanized steel sheet	1 sheet	0.92	0.78	
Steel bars	1 ton	118.4	87.5	
Steel sheets	1 ton	152.2	140.3	
Newsprint paper	1 ton	172.8	170.8	132.4 (short ton)
Raw silk	1 kg.	12.3	15.0	

Sources: Monthly statistical review of the BOK, November 1965, p. 45, 46,  
 Monthly Statistics of Japan, Bureau of Statistics, Office of the  
 Prime Minister, November, 1965, p. 86,  
 Survey of Current Business US Department of Commerce, February 1966,  
 p. 32, etc.

US AID TO THE MANUFACTURING INDUSTRY IN KOREA  
(Basic Projects)

<u>A. AID (Defense Support)</u>	<u>\$ dollars</u>
<u>1. Coded Projects</u>	
Straw Pulp Plant	61.0
Caustic Soda Plant (Korea Agr. Chemical Co.)	7.6
Caustic Soda Plant (Korea Explosive Co.)	7.6
Hard Board Plant	499.9
Paper Mill	500.0
Silicon Carbide Plant	170.0
Special Earthenware Plant	469.9
Pharmaceutical Plant (Taehan)	50.0
Rubber Hose Plant	255.5
Dyeing & Finishing Plant for Knitted Goods	250.0
Wire Rope Manufacturing Plant	121.3
Pharmaceutical Plant (Shin-A)	52.3
Pharmaceutical Plant (Taeyang)	50.0
Fishnet Making Plant	100.5
Textile Parts Plant (Cheil)	202.0
Chain Manufacturing Plant	111.5
Textile Parts Plant (Koryu)	214.3
Hwachon Dam & Power Plant	3,281.5
Ice Plant and Quick Freezer	100.0
Pharmaceutical Plant (Bumyang)	50.0
Synthetic Fiber Plant	473.6
Paper Mill	420.0
Spun Rayon Yarn Spinning Plant	1,000.0
Textile Mill	500.0
<u>2. Non-coded Projects</u>	
Chungju Urea Fertilizer Plant	33,948.5
Auto Tire Plants (2)	819.6
Pesticides Plant	110.0
Rubber Reclamation Plant	192.8
Aluminum Sulphate Plant	99.6
Pusan Iron Works	1,995.0
Waste Silk Processing Plant	470.0
Limestone Crushing Plant	499.9
Glass Bottle Plant	335.0
Starch Plants (4)	260.4
Auto Spare Parts Plant	174.6
Flour Mills (3)	509.8
Leather Plant	220.0

(Continued on next page)

US AID TO THE MANUFACTURING INDUSTRY IN KOREA (cont'd)

	<u>\$ dollars</u>
White Pigment Plant	104.3
Asbestos Plant	305.0
Silk Weaving Plant	376.0
Agar-agar Plants (3)	634.9
Marble Plant	150.0
Filature Mills Rehabilitation	744.9
Rubber Accelerator Plant	107.9
Potassium Chlorate Plant	224.7
Three Wheel Truck Plant	400.0
Pharmaceutical Plants (5)	464.9
Metal Products Plants (2)	378.1
ROKA Clothing Factory	237.2
Paper Mills (3)	1,271.0
Non-Ferrous Metal Sheet Plant	267.0
Printing Plant	193.1
Plastic Molding Plant	100.0
Communications Equipment Plant	50.0
Small Shipyards (5)	474.9

B. LOANS

3. Outstanding Loans

Nylon Yarn	3,130.5
Cement Manufacture	4,031.9
Fertilizer Plant - Chinhae	24,600.0
Fertilizer Plant - Yong Nam	24,200.0

4. Loan Applications

Straw Pulp Plant	8,447.9
Cement Plant Expansion	2,500.0
Polyester Fiber Plant	1,600.0
Nylon Plant Expansion	5,810.0

5. Fully Repaid Loans

Cement Manufacture	2,139.6
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6. Cooley Loans - Fully Repaid	<u>Won</u>
Beer Brewery	10,000
Cotton Spinning	20,000
Soy Sauce Brewery	10,000

(Continued on next page)

US AID TO THE MANUFACTURING INDUSTRY IN KOREA (cont'd)

<u>Outstanding</u>	<u>Won</u>
Bread and Biscuit	10,000
Soap Manufacture	22,000
Soap Manufacture	27,300
Nutritive Noodles	9,900
Starch, Glucose, Etc.	20,000
Mink Ranch	39,000
Feed Additive Mfg.	12,750
Yarn Sizing	30,000
<u>Total Cooley Loans Authorized</u>	210,950

TENTATIVE ESTIMATE OF GAINS FROM SUBSIDIES  
ON EXPORTS OF MANUFACTURES

(1965 - Estimates of the Mission)

A. Gain on Fiscal Charges

1st Variant: 1/

1. Reported Corporate Income Tax exemptions in 1964 <u>3/</u> (million won)	55.0
2. Reported Individual Income tax exemptions in 1964 <u>3/</u> (million won)	<u>18.1</u>
	73.1
3. Increase of exports in 1965 (as compared with 1964)	47%
4. Probable amount of tax exemptions in 1965 (million won)	107.4
5. Share of manufactures in 1965 exports (%)	60.9
6. Probable amount of income tax exemptions (net) on exports of manufactures (million won)	65.4

2nd Variant: 2/

7. Export of manufactures in 1965 - \$107 million (billion won)	28.9
8. Profit on sales 24.3% <u>4/</u> (billion won)	7.0
9. Corporate and individual income taxes - (average 25% of profits) (billion won)	1.75
10. Probable amount of income tax exemptions (gross) on exports of manufactures ( $\frac{1}{2}$ of corporate and individual taxes) (million won)	875
11. Difference between 1st and 2nd Variant .. 875-65 = (million won)	810

TENTATIVE ESTIMATE OF GAINS FROM SUBSIDIES  
ON EXPORTS OF MANUFACTURES (Cont'd)

B. Gain on Loan Service Charges

12.	Net foreign exchange earnings on exports of manufactures:		
	- Export dependence on imported inputs		26.2% <u>5/</u>
	- Net export earnings (100 - 26.2) (\$107 million) = \$79 million or	(billion won)	21.3
13.	Credits extended - 74% of net export earnings	(billion won)	15.8 <u>6/</u>
14.	Gains on interest rates charged for three-months Credit:		
	- Preferential rate of 6.5 p.a. on 15.8 billion won (for three months)	(million won)	257
	- Highest Bank rate of interest of 26% per year on 15.8 billion won for three months	(million won)	1,027
	- Gain: Difference between the regular and the preferential rates ..	(million won)	770
15.	Gains on foreign payment guarantees:		
	- Imported inputs (28.9-21.3 billion won)	(billion won)	7.6
	- Payment guarantees covering 90% of this amount	(billion won)	6.8
	- Interest rates on the payment guarantees 3 p.a. for 135 days <u>7/</u>	(million won)	75.4
	- Interest rate which would have been paid effec- tively - 18 p.a. for 135 days <u>8/</u>	(million won)	452.7
	- Gain: difference between the regular and the preferential rates	(million won)	377.3

TENTATIVE ESTIMATE OF GAINS FROM SUBSIDIES  
ON EXPORTS OF MANUFACTURES (Cont'd)

C. Total Cost of Export Incentives in 1965

	<u>1st variant</u>	<u>2nd variant</u>
Fiscal gains	65.4 million won	875.0 million won
Export credits	770.0 million won	770.0 million won
Payment guarantees	<u>377.3 million won</u>	<u>377.3 million won</u>
	<u>1,212.7 " "</u>	<u>2,022.3 " "</u>
 Gain per \$ of exports		
	<u>won 1,212.7 million</u> = 11.3 won	<u>won 2,022.3 million</u> = 18.3
	\$ 107 million	\$ 107 million won

- 1/ This variant is calculated on the basis of tax exemptions on income from exports, as reported by the Ministry of Finance for 1964 and adjusted by increase of exports in 1965.
- 2/ This variant represents a "direct" calculation of tax exemptions on income from exports. Export exemptions receive only a third priority after tax exemptions on income derived in major industries (first priority) and on income on goods produced by new or expanded facilities (second priority) were granted. The gain of 875 million won of tax exemptions on income from exports of manufactures is therefore calculated for situations in which all other tax exemption would not apply. This may become true in a very near future, when the weight of first and second priority tax exemptions would shift to industries participating very little in exports. When the overlapping of priorities will phase out, the total burden of tax exemptions would become even heavier.
- 3/ Peggy B. Musgrave: Trade Targets and Policies in Korea's Economic Development, Seoul, 1965, p. 53.
- 4/ In 1964, for all manufacturing, there is no possibility to distinguish between profits on sales and profit on exports.
- 5/ This dependence has been calculated by the Mission for 1963 on the basis of unadjusted exchange rate and for all manufacturing. As, however, exports of manufactures is predominantly taking place in investment and intermediate goods groups, which show a higher than average rate of dependence on imported inputs and, as these inputs were imported in 1965 at the adjusted rate of exchange, the real dependence on imports was evidently, substantially higher in 1965 than the Mission's calculation shows. It may be, therefore, that gains on export credits were lower than shown above, but, on the other hand, gains on payment guarantees (granted for a larger amount of imports) were higher, which largely compensates the shortcomings of the Mission's assumption.
- 6/ On the assumption, which has been checked and proved correct by the Mission, that every exporter avails of this facility.
- 7/ As of September 30, 1965.

TENTATIVE ESTIMATE OF GAINS FROM SUBSIDIES  
ON EXPORTS OF MANUFACTURES (Cont'd)

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8/ As it can be assumed, that foreign exporters would have granted a credit on payment for their deliveries anyway, it was considered more justified to apply here a new annual interest rate on operating funds loans charged by the KRB since the new credit policy, effective from September 30, 1965, and amounting to 18 p.a. only, which is considerably lower than the rate of 26 p.a. applied to show gains on export credits.

Sources: Calculated from data derived by the Mission from Foreign Trade Statistics (Ministry of Finance), new laws concerning interest rates (Korean Reconstruction Bank and the Bank of Korea), profit rates (Financial Statements of Industrial Enterprises, BOK) and dependence on imported inputs (input-output tables, BOK).

PRICE AND EXCHANGE RATE MOVEMENTS

(As Compared with Preceding Year)

	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>
A. Price increases for <u>imported</u> inputs: <sup>1/</sup> (Increase in % of prices in won)				
Metal and metal products	0.7	13.5	47.7	8.6
Fuels	11.7	6.5	29.1	26.0
Chemical products	11.3	13.0	39.0	33.5
Pulp and paper	0.4	36.0	60.1	10.4
Textile fibers and products	4.3	48.3	43.2	8.1
All commodities	8.4	19.6	40.1	20.6
B. Price increases for <u>domestically</u> produced (corresponding) items:				
Metal and metal products	5.7	9.5	37.2	25.5
Fuels (and power)	9.4	2.5	11.2	17.3
Chemical products	8.1	12.8	45.8	23.2
Pulp and paper	3.7	19.3	42.0	17.5
Textile fibers and products	6.5	14.4	41.9	21.8
All commodities (excluding grain)	8.4	26.8	29.8	8.5
C. Exchange rate				
1. Effective (won/\$) <sup>2/</sup>	130	136.5	207.2	272 (since 5/65)
2. Increases (%)	12.8	5.0	51.8	31.2
3. Realistic (won/\$)	157	189	255	272
4. Increases (%)	9.0	20.4	34.9	6.7
5. Differences in absolute values (3-1) (gain of won/\$)	27.0	52.5	46.8	0
6. Realistic Rate; Effective Rate = 100	120.7	138.5	123.1	100.0

<sup>1/</sup> Selling (wholesale) price charged by importer.

<sup>2/</sup> Average for merchandise imports.

Source: Price movement calculated from the Monthly Statistical Review of the BOK, October, 1965, p. 39-41, data for 1965 estimated. Realistic exchange rate - Mission estimate.