The role of agricultural exports in Indonesia's economic development

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The role of agricultural exports in Indonesia's economic development

by

Bernardus Sugiarta Muljana

A Dissertation Submitted to the Graduate Faculty in Partial Fulfillment of The Requirements for the Degree of DOCTOR OF PHILOSOPHY

Major Subject: Agricultural Economics

Approved:

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CHAPTER ONE INTRODUCTION

This study has three purposes. The first purpose is to provide an understanding of how agricultural exports affect Indonesia's economy. The second is to investigate whether Indonesia's agricultural exports will develop according to the goals set forth in the present Five-Year Development Plan, which covers the period 1969-70 - 1973-74.\(^1\) And the third is to study the possible effects on the execution of the plan if agricultural exports do not develop in the way expected by the planners.

The Need for the Study

One of the most intriguing features of Indonesia's present development plan is the fact that for its execution it requires that during the planning period the country's total imports should amount to 5,876 billion dollars. At the same time the planners expect that the country's foreign exchange earnings during the period will amount to only 3,982 billion dollars, and from these earnings the government is expected to pay 847 million dollars of the standing

\(^1\)Officially the execution of the present Five-Year Development Plan, which henceforth we simply will refer to as the plan, was started in June, 1969. In most cases the period 1969-73 is referred to as the planning period. To allow for the gestation period undertaken, this study considers it more appropriate to refer to 1970-74 as the planning period.
debts.

Indonesia's foreign exchange revenues received during the planning period will clearly fall short of the amounts needed to meet its obligations in the period. To be able to meet these obligations, the plan requires that the country obtain loans and attract foreign investments from abroad. In terms of US dollars, the capital inflows are expected to be 459 million in 1970, 699 million in 1971, 894 million in 1972, 1.005 billion in 1973, and 1.081 billion in 1974.

Of the total foreign exchange earnings expected during the planning period, about 80 percent is to come from agricultural exports. As will be argued in the following section, exports play a crucial role in the development of a developing country like Indonesia. This, and the fact that the agricultural sector is supposed to contribute such a large share to Indonesia's export earnings, implies that in the efforts to implement the development plan successfully, the planning authorities have assigned a very important role to agricultural exports. This strongly suggests that a study of Indonesia's agricultural exports is necessary.

Exports and Economic Development

Modern economists have always been aware of the existence of interrelationships between agricultural and industrial development. Recently many of them have shown that industrial development can start in a country only if the agricultural
sector has had the ability to create surpluses, and that for industrial development to keep going, the agricultural sector must expand its surpluses continuously.\(^1\) However, in spite of the fact that surpluses would not be very useful and perhaps would never be able to expand in the absence of trade, there have not been very many economists who are interested in the relationships between agricultural trade and economic development. As recently as 1967 certain economists were able to state that" . . . in most writings on economic development trade has been little more than an after-thought" (47, p. 403).\(^2\)

For the purpose of this dissertation, economic development is defined in a narrow sense. It is defined as a process of continuous capital formation. Using this definition, the following discussion is based on the premise that anything which contributes to the success of new investments is a positive contribution to capital formation, and, hence, to economic development. As has been shown by Nurkse, successful investments require, on the one hand, savings that

---

\(^1\)Among others: B. F. Johnston and J. W. Mellor (23), W. A. Lewis (26), J. W. Mellor (28) William Nicholls (33), J. C. H. Fei and Gustave Ranis (7, 8, 9), and Erik Thorbecke (46).

\(^2\)George S. Tolley and George D. Gwyer (48). However, see Gunnar Myrdal (32), Douglass C. North (34), and for more recent works: George L. Hicks and Geoffrey McNicoll (19) and Gerald M. Meier (27).
can be transformed into production factors, and on the other, they require markets or effective demands which are sufficient to make these investments profitable (38, pp. 5-11).

Agricultural exports contribute to capital formation mostly through their contribution to exports. It is thus necessary to see the ways in which exports contribute to capital formation.

**Contribution to income**

It is obvious that an expansion of exports will add to income and, in turn, increase the opportunities for new investments.\(^1\) It should be sufficient to mention that through its positive effects on savings as well as on effective demands an increase in income and, hence, an expansion of exports which causes the increase, shall under certain conditions enhance the country's capacity to invest.

**To meet the need for foreign exchange**

For investments to be continuously successful it is essential that certain commodities like food and clothing be available at relatively low prices. These prices should remain such that there will be no compelling need for wages to increase in such a way as to make investments unprofitable.

\(^1\)Viewing from the production side one may state "The capacity to save increases as real income rises through the more efficient resource allocation associated with international trade" (27, p. 221).
Furthermore, it is also essential that intermediate goods, such as steel, cotton yarn, chemicals, newsprints, etc., as well as spare parts be available at reasonable terms to keep existing industries running and to meet the need of the expanding ones. Finally, new capital equipment also has to be available to replace old equipment and to meet new demands for new investments.

For Indonesia, and for many other developing countries, most of these goods have to be imported. This means that foreign exchange shortages would jeopardize new investments and could cause reductions in the existing industrial capacity.¹

To those who are used to thinking in terms of supply and demand conditions in a developed economy, the problems mentioned here may not seem to be very serious. After a certain time has elapsed, the problems will automatically find the necessary solutions. What they did not take into consideration is the fact that as far as the developing countries are concerned, the law of supply and demand would only solve the problems soon enough without causing serious drawbacks in the development of the economy if foreign exchange is sufficiently available. Except for the possibility of obtaining loans

¹"The majorities of developing countries thus belong to the category of "import-sensitive economies" where the insufficient capacity to import acts as a bottle-neck, putting a ceiling to the rate of growth of the national economy" (43, p. 42).
and attracting foreign capital, to most developing countries exports are the only way to obtain foreign exchange; and expanding exports is the only means to meet the increasing needs for foreign exchange.

**Contribution to government revenues**

The prevailing conditions in the present developing countries are generally such that their governments are almost fully responsible for investments in the countries' social overhead capital. Very often they are also responsible for promoting investments in directly producing activities not only by promulgating the necessary regulations but also by providing financial help to potential private investors or industrialists. To be able to perform these responsibilities the governments need large sums of funds over and above the required amounts to meet routine obligations.

Exports make direct as well as indirect contributions to government revenues. Exporters pay export duties, and through their contribution to the country's capacity to import, they contribute indirectly to the import duties and sale taxes on the imported goods.

Most governments of the developing countries rely heavily on import duties and sale taxes for their revenues. This means that exports are important (indirect) sources of government revenues and as such become important sources of capital for government investments. The fact that investments in
social overhead capital are crucial in the promotion of investments in directly productive activities makes the importance of exports in capital formation the more obvious.\footnote{For the most instructive discussion on the relationships between social overhead capital and directly productive activities, see (21, pp. 83-97) and between the former and agricultural growth, (56).}

**Maintaining international trustworthiness**

If the foreign trade sector is to continuously contribute to the process of economic development, it should be able to keep functioning smoothly. In order to be able to keep the foreign trade sector functioning smoothly, it is essential for the country concerned to maintain its international economic trustworthiness above a certain level. The leaders of the country will do well if they keep in mind that it is primarily the country's export performance that largely determines whether its economic trustworthiness could be maintained at the desired level.

For the development of their economy, most developing countries need loans from foreign countries. For these countries exports have two additional functions to perform. In the case where loans have been obtained, exports have the function of enabling the developing countries to meet their future obligations. But they also play a crucial role in the obtainment of the loans.
As a potential debtor, the developing country concerned has to be able to convince the potential creditor that future obligations will be met according to the agreement made. As far as the potential creditor is concerned, the main evidence that the potential debtor will be able to meet future obligations is the latter's export capacity.

**Attracting foreign investments**

A developing country may have to invite foreign investors to be able to utilize available natural resources for development purposes. Profit motives frequently make domestic market oriented investments in a developing country unattractive to potential foreign investors. Consequently, to attract foreign investments, it is often necessary for a developing country to provide them with investment opportunities which are export oriented.

**Exports and economic planning**

The discussion so far is concerned with the potential roles of exports in economic development. History has shown that as far as England, Australia, Canada, and Japan were concerned, the roles discussed in the foregoing subsections have been very effective. For these countries' exports have really been "an engine of growth" (27, p. 214.) Exports have
clearly affected these countries' economies favorably.¹

History has also shown, however, that for the present developing countries the potential roles have not been effective at all. Indeed, a number of prominent economists have even claimed that "the very forces of international trade have impeded the development of poor countries" (27, p. 225). Thus Jonathan Levin, for example, states that "The result of foreign trade has simply been the creation of a 'dual economy' in which production is export-biased, and the export sector remains an island of development surrounded by a backward low-productivity sector." And Gunnar Myrdall claims that "a quite normal result of unhampered trade between two countries, of which one is industrial and the other underdeveloped, is the initiation of a cumulative process towards the impoverishment and stagnation of the latter" (27, p. 228).²

As one may expect, Myrdall and Levin are right as far as Indonesia is concerned. There are reasons to fear that even in the future Indonesia's exports if unhampered may be impeding rather than conducive to its economic development. Thus active government participation in the country's

¹According to J. S. Mill, the advantages of foreign trade are: a) market extension which, in turn, causes more extended division of labor, greater use of machinery, and inventions and improvements in the process of production; b) contacts with new objects induce people to work harder and to save; c) the introduction of foreign arts and the importation of foreign capital (27, p. 218).

²Meier quoted these from (25, p. 18); (32, pp. 201-2).
economic activities seem to be unavoidable if exports are to become "an engine of development". Within the scope of this study, the present development plan may be viewed as the formulation of the government economic activities which are required to make the export roles described in the previous subsections become effective. A somewhat detailed description of the plan will thus be presented later in this dissertation.

Agricultural exports and economic development

Specific features of the relationships between agricultural exports and economic development will be discussed in Chapter Three. For now it is sufficient to mention the following.

The importance of agricultural exports to most developing countries should be obvious from the fact that the total exports of many developing countries are largely composed of agricultural commodities.

The Approach of the Study

At the beginning of the present chapter it was mentioned that this study had three purposes. As should be expected, the three purposes are integrally related. The first and the second may be considered as the means to achieve the third one. In the next section of the present chapter, it will be shown that in terms of the organization of this dissertation
Chapter Three corresponds to the first purpose and Chapters Four and Five to the second and third. This section is merely concerned with the method of the study and the data employed in the writing.

Method of the study

A large part of this work consists of a verbal discussion which is partly descriptive and partly analytical. However, the use of some simple statistical and mathematical methods seems to be unavoidable in order to achieve the stated purposes.

In Chapter Three an attempt is made to build a simple quantitative model. The method to establish the regression coefficients of the individual equations of the model is the two-stage least square.\(^1\) The model is needed to examine the quantitative structural relationships within Indonesia's economy. The coefficients which are assumed to reflect the relationships are provided by the reduced form of the model.

Due to the low correlative coefficients and calculated t-values of the various regressions which have been tried, the model which has been established is a very simple demand-oriented one. Under a certain assumption, it can only be

\(^1\)J. Johnston (24), Chapter 9 - 5, William C. Merrill and Karl A. Fox (30), Chapter 12.4.
used to project gross domestic product, private consumption, and investment. The fact that it is demand rather than supply oriented may raise a question about its usefulness. Such a serious question calls for a serious discussion.

It has been argued that the problem of capital formation in the developing countries is "one of capital accumulation rather than lack of capital demand", and that "major constraints on growth lying on the side of supply are rooted in low productivity which makes it difficult to save, ..." (19, p. 173). On the basis of this argument the Indonesian problems of capital formation may perhaps be brought up in the following way:

A) \[ P + S + E + K^h = C + I + M + R^f, \]

where \( P \) = domestically produced goods available for consumption, \( S \) = savings, \( E \) = exports, \( K^h \) = capital inflows, \( C \) = consumption, \( I \) = investment, \( M \) = imports, and \( R^f \) = foreign exchange reserves. For the purpose of the discussion this equation may be rearranged into:

B) \[ I = P + S + E + K^h - C - M - R^f. \]

Assuming \( K^h \) and \( R^f \) to be constant, it is clear from B that the country could increase investment, \( I \), by keeping \( P \) and \( E \) unchanged and reducing consumption, \( C \), and imports, \( M \). It also could raise \( I \) by increasing \( P \) and \( E \) while keeping
C and M. unchanged. It would do even better if it could increase P and E and at the same time reduce C and M.

The foregoing line of thought is perhaps the underlying basis for some economists to feel that "... the Keynesian analysis is inadequate for underdeveloped countries where the problem is not so much the underutilization of capital equipment but an absolute shortage of capital" (19, p. 173) and to conclude that for the underdeveloped countries a supply-oriented model is adequate while a demand-oriented model is not.

Looking at Indonesia's economy from the static point of view, one may consider equations A and B very helpful. They may even be very helpful to those who are trying to see certain aspects of Indonesia's present problems as seen by the planning authorities. As will be discussed in Chapter Five, Indonesia's planners expect to increase investment by increasing savings, S, exports, E, and capital inflows, K^, more than the increase in consumption, C, imports, M. and capital inflows. However, the two equations do not seem to be adequate to reflect the underlying problems of capital formation in the country. The following are the reasons for their inadequacy.

The above equation, either A or B, which are the same, is not able to reflect the fact that investments in social overhead capital, in the extractive industries as well as in
the manufacturing industries require imported capital goods. The equation shows that investments would increase if, \textit{ceteris paribus}, imports fall.\(^1\)

The contention that there is an absolute scarcity of capital may be true but is inadequate for looking at the real problems. It is very true that there is an absolute scarcity of capital for new investments. But it should also be borne in mind that for the production of certain commodities there are overcapacities in the country. The country has made investments in thousands of hectares of trees which have the capacity to produce rubber, coconut, coffee, tea, palm oils, and spices more than the domestic and foreign demands can absorb. The newly established manufacturing industries have often produced more than they could sell. This is true in spite of their size. Furthermore, many rice farmers in certain areas have also often produced more than they consume and sell.

Several factors have caused the lack of demands faced by the Indonesian farmers. Those producing industrial crops face competition from producers in other countries and producers of synthetic materials. Domestically they face the problems of poor marketing facilities. The newly established manufacturers face competition from imported commodities.

\(^1\)In Hicks and McNicoll model it is shown that investment is a function of imports of capital goods (19, p. 156).
which mostly have better qualities than their own produce. They also partly face the problem of low domestic effective demand due to the low per capita income prevailing in the country. The rice farmers face the problems of poor inter-regional and inter-island transportation facilities.

The model introduced in this work is undoubtedly far from being adequate for any practical policy purpose. It captures much fewer relationships than it was originally intended to do. Assuming that economically as well as politically the country will be much more stable in the coming years than it was before 1965, this model would serve its main purpose if it could contribute to stimulating other economic students to try to build better models for Indonesia. However, it must be said that this model is suggested on the belief that even for developing economies a supply-oriented model would not be adequate if not complemented by a demand-oriented model.

In Chapter Four an attempt is made to project Indonesia's agricultural exports in 1974. The commodities studied for the purpose are limited to rubber, coffee, copra, palm oil, and forest products. On forest products the study concerns itself mainly with saw-logs. In combination, the five commodities contributed around 82 percent of Indonesia's total agricultural exports during the years 1960-69.

In its attempt to examine the prospects of Indonesia's
agricultural exports, the present study is primarily concerned with the demand conditions of the export commodities. This demand-oriented concern is primarily based on the observation made by the F.A.O. of the United Nations that the exports of tropical beverages and agricultural raw materials are mainly limited by their demand condition. As far as their supplies are concerned, the problem is, at least quantitatively speaking, overproduction rather than anything else. This study will thus not be concerned with problems which are directly related to the supply conditions of the commodities under study.

The projections for the world exports of the five commodities are made on the basis of the export growth rates projected by the UNCTAD of the United Nations for the period 1960-75. The basic problems with respect to the export prospects of tropical commodities are also discussed. The discussion also covers the development of the world exports of the five commodities and Indonesia's shares during the years 1950-68. Then, assuming that the changes in Indonesia's past shares were taking place at constant rates annually and that the rate will remain constant through 1974, a projection for Indonesia's exports of rubber, coffee, copra, and palm oil for 1974 is made. For the projection for the proceeds of the exports of each of these commodities, it is assumed that their 1974 prices will be the same as their average prices which

The export projections for the five commodities are used as the basis for the projection for Indonesia's total agricultural exports. In combination the five commodities contributed around 82 percent of the total agricultural exports during the years 1960-69. Total agricultural export values in 1974 will thus be assumed to be

\[
\frac{100}{82} \sum_{i=1}^{5} V_i
\]

where \( V_i \) stands for the value of the exports of either one of the five commodities studied.

For the projection for logs exports it will be assumed that Indonesia's exports of the commodity will develop according to what is expected by the planners. This assumption is based on the fact that world demand for logs has been increasing all the time. Hence, Indonesia should not have any demand problem in its exports of the commodity.

The exponential function, \( Y_t = Y_0(1+r)^t \), is employed to project the 1974 world exports of rubber, coffee, copra, and palm oil. This function is also used to compute the rates of change of Indonesia's shares in 1950-68 and in the years prior to 1974.

In Chapter Five a general discussion about the relation between international trade and planning is presented.
Then, the discussion proceeds to describing the development plan. The description also includes a comparison between the planned average growth rates of the various variables in 1970-74 and their average growth rates which prevailed in 1960-69. The model introduced in Chapter Three is then applied to projecting income, consumption, and investments in 1974. In going through this part of Chapter Five one should always keep in mind that the projections are based on the assumption that the structural relationships which are reflected by the model would prevail through the year 1974.

The data

The data employed in the study have been obtained from Indonesian as well as from international sources. Statistical information on Indonesia is largely obtained from Statistik Indonesia 1968 & 1969; an official statistical publication by the Indonesian central bureau of statistics. Nota Keuangan 1971-1972, or "Financial Memorandum 1971-72", a mimeographed document issued by the Indonesian Ministry of Finance provides data on Indonesia’s national accounts which with certain adjustments, were the bases on which the quantitative model is built (36). Information on the Five-Year Development Plan is obtained from Repelita, or Rentjuna Pembangunan Lima Tahun, the official publication on the plan issued by the Indonesian development planning agency (42). Several other Indonesian publications, a.o., Indonesia, Facts and Figures,
and *Prospek Perekonomian Indonesia* have provided information on the various aspects of Indonesia's economy (37), (26b).

For exports data the study relies heavily on the United Nations and its Food and Agriculture Organization’s publications. The study has thus made use of the Yearbook of Agricultural Production, Yearbook of Agricultural Trade, Yearbook of Forestry, Yearbook of International Trade Statistics, Trade Prospects and Capital Needs of Developing Countries, and others.

The Organization of the Dissertation

This dissertation is made up of six chapters. Each chapter consists of several sections and each section of several subsections. Where necessary a subsection is divided into several sub-subsections.

Chapter One, which is the present chapter, serves as an introduction. Chapter Two describes the structure and performance of Indonesia’s economy and its agriculture. From this chapter one will obtain some idea about the place of agriculture in the country’s economy. Thus from this chapter one will observe how dominantly agricultural the economy is. In addition, this chapter also provides some understanding about the degree to which Indonesia’s economy is dependent on its exports, to which it is dual, and to which it is geographically partitioned.

Chapter Three is an attempt to examine the relationships
between Indonesia's agricultural exports and the economy. It starts by discussing the relationships between the country's total exports and the economy. Then it presents a description of the agricultural exports and their relationships with total exports. Further, it presents a general discussion on some of the implications of the relationships between agricultural exports and the economy as a whole. The quantitative model mentioned previously is introduced in the last section of this chapter.

The projection for Indonesia's 1974 agricultural exports is presented in Chapter Four. How this chapter is organized has been described in the previous section. There is thus no need to discuss this chapter any further.

How Chapter Five is presented has also been mostly discussed in the previous section. It may be added here that the description of the development plan is arranged as follows. First, the targets in the production of the agricultural, mineral, and manufacturing commodities are described. Following this the discussion turns to describing the investment requirements and their annual and sectoral allocations. Then it gives a description on how the required investments will be financed, on the imports, exports, and capital inflows which are required to execute the plan. A very brief summary about the administrative measures which are planned to be taken during the planning period is also presented.
For the purpose of the study it is necessary that the targets which, except for those in the manufacturing sector, are expressed in physical terms, be expressed in their 1968 rupiah values. Section three of this chapter may be considered as a re-introduction of the description of the development plan after all the variables have been converted into their values.

The projections for income, consumption, and investments in 1974 are presented in section four of Chapter Five. Three projections are made. Except with respect to agricultural exports, the three projections are all based on the same assumptions. This is to facilitate the understanding of the effects of agricultural exports on the execution of the plan.

Finally, in Chapter Six what has been discussed in the first five chapters will be summarized. And finally, certain fields of research which are related to the topics discussed in this dissertation and found useful in terms of their possible contribution to knowledge of Indonesia's agricultural sector of her economy or found useful for policy purposes are suggested.
CHAPTER TWO  INDONESIA'S AGRICULTURAL SECTOR

This chapter is intended primarily to provide a general picture of Indonesia's agriculture, especially the economic aspects thereof. Before getting into the agriculture, however, it is desirable to have a general notion about the economy.

A Brief Description of Indonesia's Economy

The best way to start a very brief discussion on Indonesia's economy is, perhaps, by looking at the geographical setting of the country and the regional distribution of the population.

Geographical setting and population distribution

An inspection of the map on the next page will provide an idea of Indonesia's location and an understanding of the configuration of the various islands which make up the country. The country consists of five relatively large islands and a large number of smaller ones, which are spread on both sides of the equator between the 95° and 145° meridian. For later purposes it would be useful to become familiar with the relative size of each of the five major islands.

The total land area of the country is 2,019,360 square KM., which is a little more than 735 thousand square miles. That is about equal to the land area of the United States
Fig. 1. Republic of Indonesia, Provinces and Capitals
Australia, Provinces and Capitals

- Queensland
- New South Wales
- South Australia
- Western Australia
- Tasmania
- Northern Territory
- Victoria
- Australian Capital Territory
east of the Mississippi (20, p. 681). Java, where the central government of the country is seated, has about 6.94 percent of the total land area of the country. Sumatra covers 24.8 percent; Kalimantan, 28.33 percent; Sulawesi, 9.93 percent; and West Irian, 22.16 percent. Compared to Java, Sumatra is thus 3.58 times as large; Kalimantan, 4.08 times; Sulawesi, 1.43 times; and West Irian, 3.2 times as large (37, p. 4). None of the other islands are more than one-sixth the size of Java.

A well-known economist, Benjamin Higgins, made the speculation that if during the last four centuries Indonesia had been able to maintain her independence and remain united as it had been during the thirteenth to the fifteenth centuries, an Indonesian “take-off” might have occurred a long time ago (20, pp. 683-4). A less historically-oriented economist, however, may feel that the unbalanced regional or interisland distribution of her population has been one of the most important factors in Indonesia’s slow rate of development.

Indonesia’s latest population census was conducted in 1961. Her total population was 97.088 million that year. A very large portion of that population, 63.059 million, was in Java. In other words, about 65 percent of Indonesia’s total population live in an area the size of which is less than seven percent of the country’s total area.
In 1971 it was estimated that 80.190 million of the total 124,241 million people live in Java.

As a consequence of the extremely unbalanced population distribution among the islands, there is an extremely unequal distribution of population density in the country. The average population per square mile in the country is 197 \(^1\). While the average density in Sumatra and Sulawesi is only 97 and 123 per square mile, respectively, and in Kalimantan and Irian Barat-the-Moluccas only 23 and 9, the average density in Java is 1,365 per square mile \(^1\).\(^2\)

It should be obvious that the extremely unbalanced distribution of population between Java and the other islands, combined with the annual birth rate which is estimated to be 2.3 percent, has serious consequences on the economic development of the country.

**Geographical distribution of agricultural resources**

It will be observed soon that Indonesia’s economy is dominantly agricultural. Hence, some familiarity with the distribution of the natural agricultural resource distribution may be very useful.

\(^1\)Transformed into per square miles from per square KM. in Table A-5 of the paper \(^1\).

\(^2\)Ibid.
Wood is one of the several kinds of natural resources which are available in abundance in the country. About 119.38 million HA, or 65 percent of the total land area, is wooded. As a consequence of the unbalanced population distribution in the country, the distribution of the wooded area between Java and the other islands is very unbalanced.

The wooded area in Java as of 1968 was not more than 22 percent of the total area of the island. That same year the wooded area in Kalimantan took 68 percent of the island; that of Sumatra, 57 percent; Sulawesi, 32 percent, and that in the Moluccas and West Irian more than 70 percent of the total land area of the region (81, p. 253).

The divergences of population densities between Java and the other islands seem to have significant effects on the per farm land holding in each of the islands. As it will be shown in the next section, the per farm cultivated land holding in Java was only 0.72 HA in 1963 when Indonesia's first agricultural census was conducted. In that same year the per farm cultivated land holding in Sumatra was 1.82 HA; in Sulawesi, 1.25 HA; in Kalimantan, 2.2 HA, and in Nusa-Tenggara, 1.13 HA (6, p. 134).

One should note that the per farm land holding given in the previous paragraph does not cover land areas of perennial tree crops. If it did, the figures should have been much higher in Sumatra, Kalimantan, and Sulawesi.
The structure of the economy

The most important features of the structure of the Indonesian economy are 1) the agricultural dominance, 2) the openness, 3) the fact that there is duality in the economy, and 4) that economically the country is partitioned.

Agricultural dominance The degree to which agriculture dominates the Indonesian economy may be observed in Tables 2.1 and 2.2.

In Table 2.1 it is shown that agriculture contributed about 52 percent of the total GDP in 1968. Trade, which includes imports, exports, wholesale, and retail trade, contributed only 16 percent. Nevertheless, it occupied the second place. It should have been noticed that the mining sector, which due to its contribution to exports has always drawn much attention, contributed only 4.1 percent to the total GDP.

In Table 2.2 one observes another convincing indication of the dominance of agriculture in Indonesia's economy. Even the estimate for 1968 shows that more than 70 percent of the country's active labor force is in agriculture.

---

1 One may prefer the term "import sensitive" to "open". See footnote p. 5 for the definition of the first term. When a country is import sensitive, its exports play an important role in its economy.

2 As comparisons: In India 49 percent in 1966; Peru, 22 percent; Pakistan, 47 percent; and the Philippines, 33 percent. See: Statistical Abstract of the United States 1970, p. 812.
Table 2.1. Indonesia's GDP at 1960 market prices distributed according to the sectors of origin, 1968

<table>
<thead>
<tr>
<th>Sector</th>
<th>GDP (Rp. billion)</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>248.2</td>
<td>51.7</td>
</tr>
<tr>
<td>Mining</td>
<td>19.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>40.8</td>
<td>8.4</td>
</tr>
<tr>
<td>Construction</td>
<td>8.8</td>
<td>1.9</td>
</tr>
<tr>
<td>Electricity &amp; Gas</td>
<td>2.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Transp. &amp; Comm.</td>
<td>15.9</td>
<td>3.2</td>
</tr>
<tr>
<td>Trade</td>
<td>76.2</td>
<td>15.9</td>
</tr>
<tr>
<td>Banking &amp; Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetary Institutions</td>
<td>3.4</td>
<td>0.7</td>
</tr>
<tr>
<td>House Rent</td>
<td>9.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Public Administr. c</td>
<td>24.7</td>
<td>5.2</td>
</tr>
<tr>
<td>Various Services</td>
<td>29.4</td>
<td>6.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>478.8</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

^Source: (6, pp. 398-99).

^Forestry and fishery included.

^Defense included.
Table 2.2. Sectoral distribution of Indonesia's active labor force in the years 1961 and 1968

<table>
<thead>
<tr>
<th>Sector</th>
<th>1961</th>
<th>1968</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td>(million)</td>
<td>of total</td>
</tr>
<tr>
<td>Agriculture</td>
<td>23.50</td>
<td>71.9</td>
</tr>
<tr>
<td>Mining</td>
<td>0.09</td>
<td>0.3</td>
</tr>
<tr>
<td>Manufacture</td>
<td>1.90</td>
<td>5.7</td>
</tr>
<tr>
<td>Construction</td>
<td>0.60</td>
<td>1.8</td>
</tr>
<tr>
<td>Utilities</td>
<td>0.05</td>
<td>0.1</td>
</tr>
<tr>
<td>Trade</td>
<td>2.20</td>
<td>6.7</td>
</tr>
<tr>
<td>Monetary &amp; Credit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institution</td>
<td>0.70</td>
<td>2.1</td>
</tr>
<tr>
<td>Services</td>
<td>3.10</td>
<td>9.5</td>
</tr>
<tr>
<td>Others</td>
<td>0.60</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>32.70</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: (22, p. 276).

The result of the 1961 population census mentioned previously shows that there were 32.7 million people who were engaged in various economic activities. About 23.50 million of them, or 71.9 percent of the total were in agriculture.

An estimate made by the Institute for Economic and Social Research, University of Indonesia, shows that there were about 38.64 million active workers in 1968. About 27.10
million of them were in agriculture. In other words, about 70.2 percent of Indonesia's labor force was still in agriculture in 1968 (22, p. 276).

In terms of its contribution to GDP, as well as to the percentage of the total labor force which is engaged within the sector, Indonesia's agriculture is, thus, by far larger than any of the other sectors in the economy.

An open economy Indonesia's economy is open in the sense that foreign trade plays a significant role in the economy. Her exports contributed about 13.65 percent to the total GNP in 1968.\(^1\) And, as will be discussed later, the country's ability to maintain or expand exports will determine the future of the economy.

Dual economy Higgins conceived two types of dualism: technological and regional dualism. Technological dualism is defined as "the division of the economy into two distinct and radically different sectors, one technologically advanced and the other technologically retarded" (20, p. 19).

Regional dualism was not defined as clearly as technological dualism. From his discussion, however, one can conclude that there is a regional dualism if the economy is

\(^1\)For comparisons: Brazil, 6.4 percent (1967); Ceylon, 20.1 percent; India, 5.3 percent of its NDP (1969); the Philippines, 15.67 percent; Thailand, 19.55 (1967); Malaysia, 41.4 percent (1966); Nigeria, 17.1 percent (1966). See (53).
"characterized by large and increasing gaps in productivity and income among major regions" (20, p. 20).

The concept of technological dualism may be applied quite easily to the Indonesian conditions. In almost every major sector one can observe the dual nature of the economy. In agriculture the dual characteristic is especially common in the foreign market oriented sector. This point will be discussed in detail in the next section.

There is no duality within the mining sector. The capital requirement in this industry seems to make it impossible for any traditional type of enterprise to prevail. In the framework of the economy as a whole, however, this sector is perhaps the most important sector which makes Indonesia's economy assume its dual nature.

The mining sector is much more capital intensive than any other industry in the country except perhaps cement and fertilizer. The top managerial personnel and the skilled labor are mostly foreigners. The capital investments in the industry are also mostly foreign.

Dualism is still prevalent in the secondary industries. In these industries there are still quite a number of small-scale traditional factories beside the capital-intensive ones. Unlike mining, however, most of these firms are Indonesian owned, and at all levels the managements are composed of Indonesians. It should be mentioned, though, that Unilever
and Procter & Gamble have affiliates in the country, and that the British & American Tobacco, Ltd. occupies a very important position in the cigarette industry.

There is also dualism in the sea and land transportation industry as well as in the banking facilities. Indonesian seafarers with their traditional sailboats provided 60 percent of the sea transportation service available in 1963.\(^1\) "Village barn"\(^2\) and unregistered money-lenders probably extend more credit to the farmers than the total banking system does.\(^3\)

In sum, the dual nature of the Indonesian economy can be observed in every sector.

**Partitioned economy** It is not clear that regional dualism as defined by Higgins also is present in the country. It is true that income per capita must have differed from one major area or region to another. One cannot be sure, however, that there have been "... large and increasing gaps in productivity and income among regions."

---

\(^1\)This is based on a statement made by one of the then Deputy Prime Ministers of the country.

\(^2\)This is the literal translation of the Indonesian term "lumbung desa", an institution that extends credit and receives payments in kind rather than in money.

\(^3\)The observation is based on a statement made by a prominent regional leader in Central Java.
The factor in the Indonesian economy which, perhaps, also constitutes one of the most important reasons why the country has not yet reached the "take-off" point is the fact that the country is composed of so many islands which are not fully integrated economically. In other words, there is a regional "partition" in Indonesia's economy.

How the regional partition affects the economy, especially the agricultural exports, will be discussed in Chapter Three. As for now, attention should be given to a phenomenon that indicates the degree to which the economy is partitioned.

The data in Table 2.3 show the differences of the price of cheap rice which prevailed in 1960 and 1968 in eight cities in the country. It may have been observed from the map that Djakarta, the seat of the central government, is in West Java, Balikpapan in East Kalimantan, Djambi in South Sumatra, Makassar in South Sulawesi, Mataram in West Nusa-tenggara, East of Java, Medan in North Sumatra, Menado in North Sulawesi, and Padang in West Sumatra. The price in Djakarta is the basis for the comparison, and is given the index number 100. How unintegrated the country's economy is can be observed from the index number of the prices in the other cities.

Rice is an essential commodity for an Indonesian. The demand is very inelastic. This implies that under certain demand conditions a small change in supply would change the
Table 2.3. A comparison of the price of cheap rice in Djakarta to that in seven other cities in 1960 and 1968

<table>
<thead>
<tr>
<th>Cities</th>
<th>1960 (Percent of Djakarta price)</th>
<th>1968</th>
</tr>
</thead>
<tbody>
<tr>
<td>Djakarta</td>
<td>100.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Balikpapan</td>
<td>121.50</td>
<td>90.03</td>
</tr>
<tr>
<td>Djambi</td>
<td>155.17</td>
<td>119.76</td>
</tr>
<tr>
<td>Makassar</td>
<td>85.74</td>
<td>67.53</td>
</tr>
<tr>
<td>Mataram</td>
<td>54.78</td>
<td>44.54</td>
</tr>
<tr>
<td>Medan</td>
<td>107.29</td>
<td>100.49</td>
</tr>
<tr>
<td>Menado</td>
<td>140.71</td>
<td>117.62</td>
</tr>
<tr>
<td>Padang</td>
<td>121.82</td>
<td>114.20</td>
</tr>
</tbody>
</table>

*Source:* (6, pp. 381-2) converted into percentages using Djakarta price as a base city.

Yet, as shown in Table 2.3, the interregional disparities of the price in a period seem to be very significant. A higher geographical mobility within the country would reduce these price disparities and may induce the farmers around Makassar and Mataram to keep making efforts to produce more rice.

**Economic performance**

The fact that the country is economically underdeveloped is an indication that the performance of the economy has not
been high for some time. This being understood, the discussion in this section will merely be concerned with Indonesia's economic performance during the 1960's.

The gross domestic product and its growth Indonesia's per capita GDP was Rp 3,938.50 in 1960. The equivalent US dollar value, expressed on the basis of the official exchange rate at the time, was US$ 87.50, which was one of the lowest per capita incomes in the world. The country's total GDP at 1960 price levels was Rp 478.8 billion in 1968.

There was a time when the country's GDP went down in the years 1960-1969. The 1963 GDP was 97.8 percent of that of 1962. On the average, however, Indonesia's GDP has been growing, though at a very low rate. During the period 1960-1969 the average annual rate of growth had been about 3.37 percent. That means that, on the assumption that the population growth rate in the country had been 2.3 percent annually, per capita real income had been increasing by 0.24 percent annually (6, p. 407).

Sectoral and regional distribution of income A rough idea about the income distribution in the country may be obtained by looking into the per capita income of the workers who are employed in the various sectors of the economy. This can be done by dividing the income share of each sector by the number of workers in the corresponding sector.
Table 2.4. Indonesia's per worker income by sectors at 1960 prices in 1968

<table>
<thead>
<tr>
<th>Sector</th>
<th>Employment (million)</th>
<th>Total (Rp. billion)</th>
<th>Per Worker (Rp.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>27.10</td>
<td>248.2</td>
<td>9,158.60</td>
</tr>
<tr>
<td>Mining</td>
<td>0.15</td>
<td>19.7</td>
<td>131,333.00</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2.30</td>
<td>40.8</td>
<td>17,739.13</td>
</tr>
<tr>
<td>Construction</td>
<td>1.00</td>
<td>8.8</td>
<td>8,800.00</td>
</tr>
<tr>
<td>Monetary &amp; Credit Institution and</td>
<td>1.00</td>
<td>19.3</td>
<td>19,300.00</td>
</tr>
<tr>
<td>Transport &amp; Communication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>2.80</td>
<td>76.2</td>
<td>27,214.00</td>
</tr>
<tr>
<td>Services</td>
<td>3.50</td>
<td>29.4</td>
<td>8,400.00</td>
</tr>
<tr>
<td>Others</td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>38.64</td>
<td>478.8</td>
<td>12,383.00</td>
</tr>
</tbody>
</table>

*Source: For the GDP (6, pp. 398-9). For the number of workers (22, p. 276).*

*The dollar : rupiah official exchange rate in 1960 was 1 : 45 (6, p. 219).*

The information provided in Table 2.4 shows that per worker income is highest in the mining sector. Traders and workers in manufacturing came second and third, respectively, and workers in agriculture came fourth.
One point has to be mentioned with respect to the share of income in the mining sector. Foreign investments and employees play an important role in this sector. Consequently, a large share of the income generated in the sector goes to foreign investors and foreign employees.

It was mentioned in the previous subsection that Indonesia's economy is not integrated. That implies a low geographical mobility. It is very likely, therefore, that per capita income in the country differs from region to region. A study of the regional distribution of income on the basis of the presently available data may not be very fruitful. As far as it is related to agriculture and agricultural exports, however, the question will be touched on very briefly in the next section.

Miscellaneous The annual rate of growth of Indonesia's economy during the sixties had been very low. This was observed before. One of the factors that had contributed to the low growth rate has been inflation. During the first six years of the decade the country suffered from one of the severest inflations in history.

Using 1963 as the base year, the United Nations Statistical Office showed that the retail price index for 1962 was 46. It jumped to 9,502 in 1966, to 25,612 in 1967, and to 57,712 in 1968 (49, p. 178).

The second severest inflation which has been taking
place recently is the one in Uruguay. But its rate is considerably lower. Using 1963 as the base year, the available data show that the price index was "only" 1,768 in 1968.

One may say that it is hardly believable that income per capita was able to grow at all under such a severe inflation. One of the explanations may have been the fact that the economy is still predominantly agricultural and that the agriculture is mostly still predominantly traditional. Thus the inputs which go to the production process largely originate within the sector and were less affected by the rate of inflation.

The Agricultural Sector

In line with the previous section, the structure of this sector will be discussed first and its performance next.

The structure

There are six sectors within Indonesia's agriculture: 1 the food-processing sector, which is the subsistence sector in agriculture; the estate or plantation sector; the smallholder commercial sector; the livestock sector; the fishery sector, and the forestry sector. The sectoral distribution of the GDP in agriculture provides an indication of the relative importance of each of the sectors.

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1For the sake of convenience, the term sector will be used in the larger parts of the discussion throughout the dissertation to refer to a subsector or sub-subsector.
It is shown in the following table that from the viewpoint of its contribution to income, the subsistence sector is by far larger than any of the others. The small-holder commercial sector, which is the second largest within the agricultural sector, is only slightly more than one-fifth as large as the food sector. To provide some more understanding about Indonesia's agriculture, each of the subsectors will be discussed.

<table>
<thead>
<tr>
<th>Subsector</th>
<th>(Rp. billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Crop</td>
<td>160.2</td>
</tr>
<tr>
<td>Commercial Sector</td>
<td></td>
</tr>
<tr>
<td>Small-holder</td>
<td>35.4</td>
</tr>
<tr>
<td>Plantation</td>
<td>11.7</td>
</tr>
<tr>
<td>Livestock and its Products</td>
<td>23.6</td>
</tr>
<tr>
<td>Forestry</td>
<td>5.6</td>
</tr>
<tr>
<td>Fishery</td>
<td>11.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>248.2</strong></td>
</tr>
</tbody>
</table>

*Source: (6, pp. 398-9).*
The *food-producing or subsistence subsector*\(^1\)

In this subsection the discussion presented will be on the size of the area devoted to the subsistence subsector, the number of the farms, the distribution of both the areas and the farms between Java and the other islands, the types of crop produced, and on the relative importance of each of the types of crop in the subsector.

**Area, the number of farms, and their regional distribution**

The area on which food crops are grown totaled 12.883 million HA in 1963 (6, 136). Of that total 5.647 million were in Java, and the rest were scattered over the other islands. In that year there were 12.236 million farms in the country of which 7.935 million were in Java.

It may be observed from Table 2.6 that the ratio between the number of farms located in Java and the total farms in the country was larger than the ratio between the size of the subsistence agricultural area in Java and the total size of the particular agricultural area in the country. The former was 64.4 percent, while the latter was less than 43 percent. As a result of the larger ratio of the number of farmers, the average size of the farm in Java is much smaller. This has been mentioned in the previous section.

\(^1\)In this chapter, coffee, tea, cocoa, and spices are classified as commercial rather than food crops.
Table 2.6. The number of farms, total agricultural areas and average land holdings in the various islands, 1968

<table>
<thead>
<tr>
<th>Island or Region</th>
<th>Number of farms (million)</th>
<th>Total agricultural areas (million HA)</th>
<th>Average agricultural holding (HA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java</td>
<td>7.9</td>
<td>5.7</td>
<td>0.72</td>
</tr>
<tr>
<td>Sumatra</td>
<td>2.2</td>
<td>4.0</td>
<td>1.82</td>
</tr>
<tr>
<td>Kalimantan</td>
<td>0.5</td>
<td>1.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Sulawesi</td>
<td>0.8</td>
<td>1.0</td>
<td>1.25</td>
</tr>
<tr>
<td>Nusa-Tenggara</td>
<td>0.8</td>
<td>0.9</td>
<td>1.13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12.24</strong></td>
<td><strong>12.88</strong></td>
<td><strong>1.10</strong></td>
</tr>
</tbody>
</table>

Source: Adapted from (6, p. 134).

From this table it is clear that the average agricultural landholding in each of the four regions outside Java ranges from one-and-a-half to three times as large as that in Java.

Types of crops: Indonesia's most important food crops are rice, maize, cassava, sweet potato, soybean, and groundnuts. Rice is of first importance. It is shown in Table 2.7 that, except for that of groundnuts, in 1968 the price of rice was higher than the price of the other products. Since, except for cassava, the price of which was less than one-fifth of that of rice, the production of rice was highest,
one can state that the value of rice produced in the country was by far higher than that of maize, cassava, potato or soybean, and, as will be shown immediately, that of groundnuts.

Table 2.7. a Production of rice, maize, cassava, sweet potato, soybean, and groundnuts, and their retail prices in the rural areas in Java and Madura in 1968.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Volume (million tons)</th>
<th>Price (Rp./ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice b</td>
<td>10.416</td>
<td>42,360.0</td>
</tr>
<tr>
<td>Maize c</td>
<td>3.102</td>
<td>19,110.0</td>
</tr>
<tr>
<td>Cassava</td>
<td>11.268</td>
<td>7,260.0</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>2.282</td>
<td>7,400.0</td>
</tr>
<tr>
<td>Groundnuts c</td>
<td>0.273</td>
<td>58,840.0</td>
</tr>
<tr>
<td>Soybean</td>
<td>0.389</td>
<td>38,090.0</td>
</tr>
</tbody>
</table>

aSource: (6, pp. 129 and 383).

bIn milled rice. Ratio of rice: dry stalked padi is 52:100 (6, p. 129).

cShelled.

The price of groundnuts was almost 40 percent higher than that of rice. Its production, however, was less than four percent of that of rice. Its total value is thus much smaller than that of the latter.

The total value of rice at the average rural retail
prices in Java and Madura\(^1\) was Rp. 441.222 billion. That was more than twice as high as the total value of the other food commodities combined, which was about Rp. 188.052 billion. In other words, the total retail value of rice production in the rural area of Java and Madura in 1968 was about 234.5 percent of the values of the other food commodities combined.

It may be useful to note that the area on which rice was grown in 1968 was only 27 percent greater than the combined total areas on which the other food products were grown. The distribution among the various crops of the utilized area in that year measured in million HA are: rice, 7.96; cassava, 1.53; soybean, 0.39; maize, 3.27; sweet potato, 0.39, and groundnuts, 0.68.

It was mentioned before that the total value of rice produced in 1968 was 234.5 percent of the combined total values of the other food crops. Comparing this percentage figure with the one in the previous paragraph, one would find an interesting relationship. Though the land area devoted to the production of rice was only 27.2 percent more than the area utilized for the other food crops, the production of rice resulted in gross income which was 134.5

\(^1\)Whenever Java is mentioned in this work, it is meant to include Madura.
percent higher.\footnote{Such a relationship as shown here is worth a special study. For the purpose of this work, however, it should be sufficient to mention the following possibilities as possible causes for the unproportionate relationship:}

The inter-island distribution of food production and the area required Java's share in the production of food crops in 1968 is shown in Table 2.8. The share which the island had of the land area devoted to the production of the commodities are also shown in the table. In this table it can be seen that except for rice and sweet potato, Java produced over 70 percent of Indonesia's total production of

\footnote{\begin{enumerate}
\item The areas on which rice is cultivated may be more fertile than those on which the other food crops are grown;
\item the cultivation of rice is probably more intensive than that of the others;
\item perhaps, it takes longer for rice than for the other food crops to reach maturity;
\item in cases where crop rotations are possible or even required, rice is, perhaps, grown during the climatologically best season in the year;
\item the fact that in certain areas rice can be grown twice a year may also be one of the reasons for the unproportionate relationships.
\end{enumerate} One, or a combination of two or more of these factors, may have been the reason why the per HA gross income earned from rice production is higher than from growing other food crops.}
Table 2.8. Java's share in the production of food crops in the land area required, 1968

<table>
<thead>
<tr>
<th>Food crops</th>
<th>Land area</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>52.59</td>
<td>54.76</td>
</tr>
<tr>
<td>Maize</td>
<td>71.64</td>
<td>72.68</td>
</tr>
<tr>
<td>Cassava</td>
<td>78.11</td>
<td>76.67</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>59.49</td>
<td>55.91</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>81.54</td>
<td>80.40</td>
</tr>
<tr>
<td>Soybeans</td>
<td>79.29</td>
<td>81.63</td>
</tr>
</tbody>
</table>

^a^ Source: Transformed into percentage of total from (6, pp. 128-9).
the crops in 1968. Its share in rice production was about 54 percent, and in sweet potato production 56 percent. The shares in the land area used for the production of the two commodities were about 53 percent and 59 percent, respectively.

It may be recalled that about 65 percent of Indonesia's population live in Java. Comparing the percentage of food production to the percentage of population, one may draw a conclusion that per capita consumption of domestically produced rice in Java is less than in the other islands, and consumption of the other types of food is more, except that of sweet potatoes.

With a very few exceptions, rice occupies the most important place in the demand for food all over the country. This condition probably will remain as long as Indonesia's real income per capita is low. It is useful, thus, to acquire some idea about the regional distribution of rice production and the land area required outside Java in addition to the one in Java.

It can be observed from Table 2.9 that Sumatra's share in total production of rice in the country in 1968 was by far larger than the share of each of the other four major regions. Sumatra's share in production was 24.56 percent, and in land area was 24.38 percent. While their shares in land area ranged from 0.06 percent, in Maluku/Irian Barat,
to 9.33 percent in Kalimantan, the shares the other four major regions had in production ranged from 0.03 percent in Maluku/Irian Barat, to 8.87 percent in Sulawesi.

Table 2.9. The regional distribution of rice production and the land area in 1968

<table>
<thead>
<tr>
<th>Island or Region</th>
<th>Land Area</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java</td>
<td>52.6</td>
<td>54.7</td>
</tr>
<tr>
<td>Sumatra</td>
<td>23.6</td>
<td>24.5</td>
</tr>
<tr>
<td>Kalimantan</td>
<td>9.0</td>
<td>5.9</td>
</tr>
<tr>
<td>Sulawesi</td>
<td>8.9</td>
<td>8.9</td>
</tr>
<tr>
<td>Maluku/Irian Barat</td>
<td>0.1</td>
<td>0.03</td>
</tr>
<tr>
<td>Nusa-Tenggara</td>
<td>5.9</td>
<td>5.8</td>
</tr>
<tr>
<td>Others</td>
<td>0.9</td>
<td>8.9</td>
</tr>
</tbody>
</table>

aSource: transformed into percentage of total from (6, pp. 128-9).

Before going into the next discussion one should note that the land/production ratios in Java and Sumatra were less than unity; 0.96 in the former, and 0.99 in the latter. The land production ratios in the other regions, however, are larger than unity; 1.57 in Kalimantan, 1.04 in Sulawesi and Nusa-Tenggara, and 2 in Maluku/Irian Barat. Without any further study it is impossible to know whether the differences between these ratios reflect differences in degree of
land fertility, differences in the degree of intensity of cultivation, or whether they reflect differences in skill or method of production.

Commercial agriculture

The commercial sector of Indonesia's agriculture produces rubber, palm kernels, palm oil, coffee, tea, copra, pepper, tobacco, sugar, and some other commodities. This sector is the one in agriculture in which dualism prevails. In this sector large-scale, capital-intensive, modern capital equipment using estate or plantation farms exist side by side with small-holders' agriculture, in which farmers are still using labor intensive methods of production.

Estate or plantation agriculture Including coconut plantations, the latest date on which data were obtained was in 1963; there were in 1968 about 1230 estate farms in the country.

The data in Table 2.10 show that 835.6 thousand HA were planted by the estate farmers. The data also show that the number of rubber plantations was by far higher than any of the other types of plantations. There were 648 of the former.

Coffee plantations came next. One observes from the table that there were only 136 of them, which was just slightly more than one-fifth of the number of the rubber plantations.
Tea and copra were the only other crops for which there were more than 100 plantations. There were 121 tea plantations and 118 copra.

Table 2.10.\(^a\) Number of plantations by type of products and size of area occupied in 1968

<table>
<thead>
<tr>
<th>Type of Plantations</th>
<th>Number of farms</th>
<th>Total Area (1000 HA)</th>
<th>Average size of farms (1000 HA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar cane</td>
<td>55</td>
<td>65.5</td>
<td>1.19</td>
</tr>
<tr>
<td>Rubber</td>
<td>648</td>
<td>509.8</td>
<td>0.79</td>
</tr>
<tr>
<td>Coffee</td>
<td>136</td>
<td>38.8</td>
<td>0.29</td>
</tr>
<tr>
<td>Tea</td>
<td>121</td>
<td>61.5</td>
<td>0.51</td>
</tr>
<tr>
<td>Cinchona</td>
<td>42</td>
<td>2.2</td>
<td>0.05</td>
</tr>
<tr>
<td>Cocoa</td>
<td>25</td>
<td>7.0</td>
<td>0.28</td>
</tr>
<tr>
<td>Oil palm</td>
<td>42</td>
<td>115.3</td>
<td>2.75</td>
</tr>
<tr>
<td>Fibre</td>
<td>4</td>
<td>4.6</td>
<td>1.15</td>
</tr>
<tr>
<td>Tobacco</td>
<td>37</td>
<td>10.1</td>
<td>0.27</td>
</tr>
<tr>
<td>Coconut</td>
<td>118(^b)</td>
<td>20.8(^b)</td>
<td>0.18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,228</strong></td>
<td><strong>835.6</strong></td>
<td><strong>0.68</strong></td>
</tr>
</tbody>
</table>

\(^a\)Source: (6, pp. 146-9).

\(^b\)Based on 1962 data (37, p. 255).

Among the types of plantations already mentioned, the average size of the rubber plantations was the largest.
Tea plantations came second, and those growing coffee and coconut were third and fourth, respectively.

Of the crops for which there are less than 100 plantations, oil palm plantations seem to be the largest ones. The average size of these plantations was larger than any of the other types of the estate farms. Thus, in terms of the average size of the farms, those growing cane came after the ones growing oil palm. The average size of the oil plantations was 2.75 thousand HA, while that of sugar cane plantations was 1.19 thousand HA.

Leaving aside those which utilize less than 10 thousand HA of land area, it could be said that the Indonesian plantation sector's major products are sugar, rubber, coffee, tea, palm oil and kernel, tobacco and copra. From the following table one can observe the relative importance of each of the types of plantations within the sector.

Table 2.11.a Plantation production by types in 1968 and the price weight of each type

<table>
<thead>
<tr>
<th>Types of Plantations</th>
<th>Production (thousand tons)</th>
<th>Price (Rp./ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>558.18</td>
<td>59,330</td>
</tr>
<tr>
<td>Rubber</td>
<td>207.57</td>
<td>148,090</td>
</tr>
<tr>
<td>Coffee</td>
<td>13.90</td>
<td>111,280</td>
</tr>
<tr>
<td>Tea</td>
<td>39.54</td>
<td>113,540</td>
</tr>
</tbody>
</table>

*aSource: (6, pp. 153, 174) and (3, p. 109).*
Table 2.11. (Continued)

<table>
<thead>
<tr>
<th>Types of Plantations</th>
<th>Production (thousand tons)</th>
<th>Price (Rp./ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Palm</td>
<td>118.23</td>
<td>25.851^</td>
</tr>
<tr>
<td>Tobacco</td>
<td>6.15</td>
<td>592,360^c</td>
</tr>
<tr>
<td>Coconut</td>
<td>7.41</td>
<td>49,970</td>
</tr>
</tbody>
</table>

^Converted from (53, p. 13).

cBased on a USDA price weight which shows that tobacco weighs four times as much as rubber (52, p. 13).

On the basis of the prices given in Table 2.11, the total values of the commodity produced by each type of plantation, measured in billion rupiah, is as follows: sugar, 33.11; coffee, 1.55; tobacco, 3.67; rubber, 30.74 oil palm, 4.06, coconut, 0.37; and tea, 4.49.

From the point of view of the value of the total production of the commodity, it is clear that sugar, rubber, oil palm plantations are the first, second, and third most important plantations in the country. Tea, tobacco, coffee, and coconut are by far less important than the three.

Some attention should now be given to the geographical distribution of the plantations.

It has been mentioned that Java has only 6.94 percent of the country's total land area and a population density
of 1,365 per square mile. In spite of such a condition, 637 of the 1,228 plantations are in Java. The rest are distributed as follows: 343 are in Sumatra, 33 are in Sulawesi, and 18 are in Nusa-Tenggara (6, p. 161).

Information on the distribution of the plantations and that of the planted land area in 1962 as shown in the Statistical Pocketbook of Indonesia 1968 and 1969 are presented in Table 2.12.

Table 2.12. a Regional distribution of the estate farms and of the land area by types, 1962

<table>
<thead>
<tr>
<th>Types of Plantation</th>
<th>Java (1000 HA)</th>
<th>Sumatra (1000 HA)</th>
<th>Kalimantan (1000 HA)</th>
<th>Sulawesi (1000 HA)</th>
<th>Nusa-Tenggara (1000 HA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td>197.34</td>
<td>320.78</td>
<td>11.09</td>
<td>1.68</td>
<td>0.23</td>
</tr>
<tr>
<td>Tea</td>
<td>57.89</td>
<td>14.55</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coffee</td>
<td>40.89</td>
<td>0.63</td>
<td>-</td>
<td>0.40</td>
<td>0.76</td>
</tr>
<tr>
<td>Cocoa</td>
<td>4.90</td>
<td>0.67</td>
<td>-</td>
<td>0.01</td>
<td>-</td>
</tr>
<tr>
<td>Oil palm</td>
<td>1.14</td>
<td>104.68</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coconut</td>
<td>4.49</td>
<td>4.10</td>
<td>0.44</td>
<td>6.78</td>
<td>1.63</td>
</tr>
<tr>
<td>Cinchona</td>
<td>2.81</td>
<td>0.22</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total land area</td>
<td>309.46</td>
<td>445.85</td>
<td>11.53</td>
<td>8.87</td>
<td>2.62</td>
</tr>
<tr>
<td>Total plantations</td>
<td>637</td>
<td>343</td>
<td>33</td>
<td>89</td>
<td>18</td>
</tr>
</tbody>
</table>

aSource: (6, pp. 161, 165).
From Table 2.12 one observes that Sumatra's contribution to the total land area for plantations was 57.28 percent. Most of the area contributed was devoted to rubber and oil palm plantations. Thus 425.5 thousand HA of the estate area in Sumatra was devoted to the two commodities. Tea and coconut plantations, each occupying 14.77 thousand HA and 4.10 thousand HA, took almost all of the rest.

Java's share in the total area required for plantations was 39.75 percent, considerably less than that of Sumatra. However, in view of the facts that the former is relatively small, that the population density is very high, and that the share in the total land area for food production is very large, the 39.75 percent contribution to plantations should be considered surprisingly large.

**Small-holder commercial agriculture** There is very little information available on the small-holder commercial agricultural sector. This sector produces everything the plantation sector does except oil palm and cinchona. To obtain information on the structure of the subsector it is necessary to resort to older data.

It is clear from Table 2.13 that in 1965 coconut and rubber farms occupied much larger areas than any of the others. Thus rubber farms occupied a land area of about 69 percent as large as that occupied by coconut. Coffee, which was the third largest, was grown on a land area that was
hardly more than 20 percent as large as the area occupied by rubber.

The 1963-67 average annual production of coconut was more than 2.5 times that of rubber. Rubber production in that year was almost five times as large as that of coffee. Production of the other commodities was less than that of coffee.

Based on the prices given in Table 2.11, the value of the commodities produced by the small-holder farms, measured in billion rupiahs are: sugar, 18.57; coffee, 11.80; tea, 4.88; rubber, 75.82; coconut, 64.86; tobacco, 46.80; spices, 7.92.

The values of the production of the various types of farms shown in Table 2.13 indicate that in terms of their contribution to Indonesia's GDP, the small-holder farms which produce rubber and coconut are the first and second most important ones. Their values exceed those of the others by a considerable margin. To a certain degree this is also the case with tobacco farms, which come third. The values of sugar, spices, coffee, and tea production by small-holder farms are much less.

Unlike the case of the plantation sector, information on the geographical distribution of small-holder commercial farms is very scanty. On the basis of the available data, the geographical distribution of the small-holder commercial
Table 2.13. Land area occupied by small-holder farmers in 1965, and the sector's average annual production in 1963-7.

<table>
<thead>
<tr>
<th>Type of Crops</th>
<th>Area size&lt;sup&gt;a&lt;/sup&gt; (thousand HA)</th>
<th>Production&lt;sup&gt;b&lt;/sup&gt; (thousand tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td>1,301.5</td>
<td>512.0</td>
</tr>
<tr>
<td>Coffee</td>
<td>259.7</td>
<td>106.0</td>
</tr>
<tr>
<td>Coconut</td>
<td>1,869.9</td>
<td>1,298.0</td>
</tr>
<tr>
<td>Tea</td>
<td>60.6</td>
<td>43.0</td>
</tr>
<tr>
<td>Tobacco</td>
<td>163.3</td>
<td>79.0</td>
</tr>
<tr>
<td>Spices</td>
<td>119.9</td>
<td>59.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>Source: (37, pp. 246-8).

<sup>b</sup>Source: (43, p. 215).

farms can be mentioned in very general terms only.

The production of small-holder rubber is concentrated in South Sumatra, West Kalimantan, East Sumatra, South and East Kalimantan, and North Sumatra. The share in the production of each of the regions mentioned here are, respectively, 30%, 18%, 16%, 10%, 8%, and 2% (37, p. 426).

Small-holders' coconuts are produced all over the country. The portion which is produced for exports, however, comes largely from Central and North Sulawesi and the Moluccas (43, p. 239).

Tobacco growers live in Central and East Java (42, pp.
Coffee is grown in South Sumatra, Lampong, East Java, and Bali (43, p. 235). Tea is perhaps produced mostly in West Java and North Sumatra.

**Forestry**

Indonesia's forestry industry produces primarily sawlogs, charcoal, bamboo, and rattan. Judged on the basis of the recorded data, the industry has not played a very important role in the economy until recently. Its contribution to total GDP in 1968 was 5.6 billion, or about 1.2 percent. The estimated contribution to the total employment in 1961 was 0.3 million, which was less than one percent. The most important contribution of forestry to the economy is made in exports. Thus, in 1968, the exports were valued at about US$ 33.00 million, which was about 4.65 percent of the total exports in that year.¹

The geographical distribution of the forest areas should also be mentioned. The distribution in terms of the percentage of the land area of each of the islands was mentioned in the previous section. In terms of the absolute size in each island or region, the distribution of the forest areas is as follows (in thousand HA): Java and Madura, 2,989; Sulawesi,

¹A recent estimate shows that timber contributed about 9.5 percent to Indonesia's 1970-71 exports (2, p. 5).
9,942; Sumatra 28,420; Maluku and West Irian, 37,500; Kalimantan, 41,470, and Nusa-Tenggara, 1485.

Not all of the forest has been exploited. According to the latest estimate, the portion which has been exploited is 100 percent in Java, about 30 percent in Sumatra, 11 percent in Kalimantan, 60 percent in Sulawesi, less than one percent in Maluku and Irian Barat, and about 85 percent in Nusa-Tenggara (6, p. 172).

The performance of the agricultural sector

The most useful approach to study the performance of Indonesia's agricultural sector is to try to see the relationships of the development in the sector to that in the others. In Chapter Three some of the relationships will be examined. In this subsection, however, the discussion will be limited to production changes. The exports of forest products will not be as fully discussed later in Chapter Four as that of the other major export commodities. Hence, the discussion on forest products in this subsection will also touch on their exports.

Production The changes in Indonesia's food production between 1960 and 1969 may be seen in Table 2.14. The data show that rice and maize productions in 1969 were higher than in 1960. For the rest of the commodities, however, production in 1969 was lower, except for groundnuts production which was shown to be the same for both years.
Table 2.14. Production of food crops in 1960 and 1969 in million tons

<table>
<thead>
<tr>
<th>Types of Crops</th>
<th>1960⁵</th>
<th>1969⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>8.77</td>
<td>10.80</td>
</tr>
<tr>
<td>Maize</td>
<td>2.46</td>
<td>2.68</td>
</tr>
<tr>
<td>Cassava</td>
<td>11.38</td>
<td>11.14</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>2.67</td>
<td>1.98</td>
</tr>
<tr>
<td>Soybean</td>
<td>0.44</td>
<td>0.42</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>0.56</td>
<td>0.56</td>
</tr>
</tbody>
</table>

⁵Source: For 1960 (37, p. 241) converted into rice.

⁵Source: For 1969 (36, P. 204).

The average of 1968 and 1969. The data on maize show that production alternates from low to high and vice versa every year.

Rice production in 1969 was 1.93 million ton or 23.14 percent higher than in 1960. In other words, there had been an average increase in rice production of about 2.57 percent annually. Maize production did not increase that much. During the same period its average rate of increase was only 0.99 percent.

Among the food commodities with lower production, cassava's decline was smallest. While sweet potato and soybeans declined on the average by 2.87 percent and 0.5 percent annually, respectively, cassava's annual rate of
The production performance of the commercial sector is shown in Table 2.15.

Table 2.15. Production of Indonesia's major commercial crops in 1960 and 1969 in million tons

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td>0.216</td>
<td>0.227</td>
<td>0.405</td>
<td>0.545</td>
</tr>
<tr>
<td>Oil palm</td>
<td>0.174</td>
<td>0.189</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coffee</td>
<td>0.018</td>
<td>0.014</td>
<td>0.078</td>
<td>0.143</td>
</tr>
<tr>
<td>Tea</td>
<td>0.041</td>
<td>0.040</td>
<td>0.037</td>
<td>0.062</td>
</tr>
<tr>
<td>Copra</td>
<td>0.009</td>
<td>0.007</td>
<td>1.239</td>
<td>1.220</td>
</tr>
<tr>
<td>Tobacco</td>
<td>0.006</td>
<td>0.006</td>
<td>0.069</td>
<td>0.066</td>
</tr>
<tr>
<td>Cane Sugar</td>
<td>0.564</td>
<td>0.624</td>
<td>0.266</td>
<td>0.270</td>
</tr>
<tr>
<td>Spice</td>
<td>-</td>
<td>-</td>
<td>0.022</td>
<td>-</td>
</tr>
</tbody>
</table>

\(^a\)Source: For 1960 plantation (6, p. 153).

\(^b\)Source: For 1960 small-holder (37, pp. 246-8).

\(^c\)Source: For 1969 (36, p. 204).

\(^d\)1967 figures.

\(^e\)1968 figures.

As shown in Table 2.15, rubber production in 1969 was larger than in 1960 in both the plantation and the small-holder sector. However, the difference in the rate of
increase was striking. Rubber production in the plantation sector increased by five percent during the period. In the small-holder sector, on the other hand, the increase was 34.5 percent.

In contrast to that of rubber, copra production during the period had fallen in both subsectors. The decline in the plantation sector was much larger than in the small-holder sector. In the latter sector, the decline was about 1.54 percent. In the plantation sector it was about 22.3 percent.

The most striking difference between the performance of the plantation sector and that of the small-holders took place in the production of coffee and tea. Respectively, production of small-holder coffee and tea had increased by 83.3 percent and 67.6 percent. In the plantation sector, production of the two commodities had declined by 22.3 percent in coffee and 2.4 percent in tea.

Forest products Indonesia's timber production in 1969 was much higher than in 1960. As shown in Table 2.16, in 1960 it was only two million $M^3$. In 1969 it was over six million $M^3$. In other words, timber production had increased

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1Note that this comparison is not entirely accurate in the sense that it assumes estate farm copra production were the same for 1968 and 1969.
by more than 200 percent during the years 1960-1969.

Table 2.16. Production of forest products in 1960 and 1969

<table>
<thead>
<tr>
<th>Type of Product</th>
<th>1960</th>
<th>1969</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber</td>
<td>1,859.0</td>
<td>6,206.0</td>
</tr>
<tr>
<td>Firewood</td>
<td>1,469.0</td>
<td>1,009.0</td>
</tr>
<tr>
<td>Charcoal</td>
<td>420.0</td>
<td>120.0</td>
</tr>
<tr>
<td>Rattan</td>
<td>49.0</td>
<td>58.0</td>
</tr>
<tr>
<td>Bamboo</td>
<td>5,067.0</td>
<td>3,609.0</td>
</tr>
</tbody>
</table>

- **Source**: For 1960 (6, p. 173) except for rattan and bamboo. For rattan and bamboo (37, p. 283). For 1969 (36, p. 211).

- **Timber and firewood in M³.**

- **Charcoal and rattan in tons.**

- **Bamboo in pieces.**

With the exception of rattan, production of all the other major forest commodities in 1969 was significantly lower in 1960. Production of firewood, charcoal, and bamboo in 1969 was 68.6 percent, 28.6 percent, and 71.2 percent of that in 1960, respectively.

The country's exports of forest products are mainly composed of timber. In 1960 her timber export was about US$ 2.03 million (6, p. 175). Exports of the other forest products totaled about US$ 6.11 million. The total value of the
exports of forest products in 1960 was thus about US$ 8.13 million. In 1969 the country's timber exports alone amounted to US$ 33.3 million (36, p. 211). Thus, assuming that the exports of the other products in 1969 were not lower than in 1960, one may state that the value of Indonesia's exports of forest products in 1969 was more than 400 percent of that in 1960.

Production and exports In the previous section it was mentioned that agriculture contributed 51.7 percent to Indonesia's total gross domestic product in 1968. In terms of current prices the country's total gross domestic product in that year was 1,993.9 billion rupiah and agriculture's contribution was 1,037.7 billion rupiah.

In terms of the current foreign exchange rate in that year, agricultural exports amounted to about 155.9 billion rupiah. Food exports, which were composed primarily of coffee, tea, spices, and oilseed cake and flour, contributed 34.09 billion rupiah, and industrial commodities contributed about 121.8 billion rupiah. Natural rubber contributed about 79 percent to the exports of industrial commodities.

How much agriculture contributed to the total exports will be discussed in the next chapter. It may be mentioned now that agricultural export contribution to agricultural income is about 15 percent. This implies that their share in the total gross domestic product in that year was 7.7
percent, which is not very large. It should be kept in mind, however, that the ability of the agricultural export sector to contribute to capital formation would not only depend on its share in the total gross domestic product. It also will depend on the per capita income in the sector, how the 7.7 percent of income is distributed among the recipients on the marginal propensity to save and the marginal propensity to consume imported goods of the various groups within the sector, as well as on their ability to invest. These factors will be discussed in Chapter Three.

Conclusion

The food-producing sector is dominant in Indonesia's agriculture. The food-growing farmers mostly live in Java and are largely subsistence farmers. One may conclude thus that Indonesia's agriculture is largely subsistence agriculture.

In the years 1960-69, Indonesian agricultural production as a whole grew at an average annual rate of 2.21 percent.¹ This growth rate was attributable largely to the growth rates which were obtained in the production of small-holder coffee, rubber and tea, of rice, of fish, and that of timber. The production growth rates of the other agricultural commodities were either much smaller or negative.

¹Computed from Table A-2-2.
The agricultural export growth rates will be discussed in Chapters Three and Four. To complete the description of Indonesia's agricultural performance it should be mentioned that at the going price levels the country's food production in 1960-69 was not sufficient to meet the demand. This is shown by the fact that during the period the country had to import rice while no export of food commodities took place to any significant extent. In 1968 rice imports amounted to US$ 96.40 million (6, p. 232). In addition the country also imported cloves, tobacco, and cotton in that year. In total the imports of the three commodities were around US$ 31.0 million (6, p. 229).
CHAPTER THREE  THE ROLE OF AGRICULTURAL EXPORTS IN
INDONESIA'S ECONOMIC DEVELOPMENT

The significance of the role of agricultural exports in Indonesia's economic development depends, first of all, on the importance of total exports on the country's economy and the share of agriculture in the total exports. In addition to that, it also depends on the agricultural exports' ability to contribute directly to investments and to the expansion of domestic markets for the expanding domestic industries.

The importance of exports in Indonesia's economy will be discussed first in this chapter. Agriculture's contribution to exports will be considered next along with a discussion of the role of agricultural exports in stimulating expansion. Finally, a quantitative model illustrating the effects of agricultural exports on other economic variables during the 1960's will be presented.

Indonesia's Exports and Her Economy

Indonesia's exports are composed mainly of agricultural and mineral products. The exports of agricultural products include copra, coffee, palm oil, palm kernel, spices, vegetable fibers, livestock, and forest products. Among the various forest products, exports of hardwood logs are predominant.

Crude petroleum and its products are dominant among the
exports of mineral goods. The other products include tin and bauxite. Compared to that of petroleum and its products, however, the exports of the two commodities are small indeed. In 1969, for instance, exports of crude petroleum and its products amounted to US$ 380.00 millions. That same year tin exports were only US$ 55.70 millions. Exports of bauxite seemed to be so small that they were not even mentioned as a separate item in the document from which these figures are cited (36, p. 183).

**Contribution to income**

Expressed in terms of billion rupiahs, Indonesia's exports during the 1960's were given as in Table 3.1.

<table>
<thead>
<tr>
<th>Years</th>
<th>Values</th>
<th>Years</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>52.0</td>
<td>1965</td>
<td>56.2</td>
</tr>
<tr>
<td>1961</td>
<td>43.0</td>
<td>1966</td>
<td>55.6</td>
</tr>
<tr>
<td>1962</td>
<td>51.8</td>
<td>1967</td>
<td>55.5</td>
</tr>
<tr>
<td>1963</td>
<td>48.7</td>
<td>1968</td>
<td>61.3</td>
</tr>
<tr>
<td>1964</td>
<td>54.5</td>
<td>1969</td>
<td>63.4</td>
</tr>
</tbody>
</table>

*aSource: (36, p. 201).*

For each year these exports accounted for from 10.51 to 13.43 percent of the country's gross national products. For the last four years and two of the other six years, the
percentage values ranged from 12.42 to 12.95.

Relative to the country's GNP, Indonesia's exports are small compared to the exports of most of the other countries. This was mentioned in Chapter Two. Within the scope of Indonesia's income composition, \( Y = C + I + E - M + G \), exports occupy the second highest place after private consumption.

**Contribution to government revenues**

Indonesia's economic "development" in the years 1960-67 may perhaps be cited as a negative example to illustrate the strategic role of government investments in a developing country.

Prior to 1967 Indonesia's economy had been ridden by severe inflation. Under conditions prevailing during the period, few of the potential private investors were attracted to making investments in the country. Thus, even if it was only to prevent the economy from deteriorating too rapidly, the government had to make investments, especially in sectors and projects which gave quick results.

Since government investments played an important role in preventing capital destruction, government revenues must have played an extremely important role in Indonesia's economy during the 1960's.

From Table 3.2 one observes that the direct contribution of exports to government revenues in the years 1965-68
was not very large. It amounted to only 15.3 percent of
the total government revenue in 1965 and to about 12.5 per­
cent, 7.5 percent, and 2.5 percent in each of the correspond­
ing years.

One should, however, also take into consideration the
indirect contribution that exports made through imports.
A part of the import duties during those years should be in­
directly attributed to exports.

Table 3.2. Total government revenues and revenues from
import and export duties, 1965-68.

<table>
<thead>
<tr>
<th>Years</th>
<th>Total government revenues (billion rupiah)</th>
<th>Revenues from duties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Export (billion rupiah)</td>
</tr>
<tr>
<td>1965</td>
<td>0.92</td>
<td>n.a.</td>
</tr>
<tr>
<td>1966</td>
<td>13.10</td>
<td>2.0</td>
</tr>
<tr>
<td>1967</td>
<td>84.90</td>
<td>10.6</td>
</tr>
<tr>
<td>1968</td>
<td>185.20</td>
<td>13.9</td>
</tr>
</tbody>
</table>

^Source: (43, p. 76).

It is shown in Table 3.2 that for the period 1967-68
import duties' contribution to government revenues ranged from
29.9 percent in 1965 to about 19.1 percent in 1967. It
should be noted, however, that parts of the import duties
should indirectly be attributed to foreign loans. To be
able to reveal the shares of import duties which were
indirectly attributable to exports, three assumptions must be made.

One is that the values of imports that were attributable to foreign loans were equal to the values of the loans. Two, the import duties are levied on \textit{ad valorem} basis. And three, in determining the rates of duties on the various import commodities, no discrimination is made between commodities for which the payments were made with foreign loans and those for which the payments were made with export earnings.

After the appropriate adjustments are made, it is found that the import duties which were indirectly attributable to exports in the years 1965-68 were 29.9 percent, 27.0 percent, 19.1 percent, and 28.1 percent of the total government revenues, respectively.\textsuperscript{1} Thus, the total direct and indirect contributions to government revenues which were made

\textsuperscript{1}During the four-year period, the capital inflows in terms of rupiahs were 17.6 billion in 1965, 18.2 billion in 1966, 12.8 billion in 1967, and 8.3 billion in 1968.\textsuperscript{37,481} and (3, pp. 112, 114). Imports were 47.5 billion, 45.5 billion, 58.3 billion, and 62.8 billion, respectively (36, 201). Government revenue, export and import duties were as shown in Table 3.2. The total direct and indirect contribution of exports to government revenues were computed in the following way:

\[ \frac{100 (M - K^f)}{M} \cdot \frac{T_m}{100} + \frac{T_X}{R^e} \cdot \frac{100}{100}, \]

where $R^e = \text{government revenues}$, $M = \text{imports}$, $T_m = \text{import duties}$ and $T_X = \text{export duties}$. 
by the export sector during the four-year period were 29.9 percent in 1965, 39.9 percent in 1966, 26.6 percent in 1967, and 30.6 percent in 1968.

**Contribution to foreign exchange earnings**

Indonesia's position in international politics has been such that she cannot rely very heavily on foreign aid to obtain foreign exchange she needs.

The amounts of foreign exchange Indonesia earned from her exports will be discussed in the next section. For now, it is sufficient to mention that during the 1960's the capital inflows reached such a level that in 1966 Indonesia's foreign debt amounted to US$ 2,211.8 millions (42, p. 94). That was quite a burden for a country with an annual per capita income of about US$ 90. It also shows that during the sixties, Indonesia's exports were not sufficient to meet the country's foreign exchange needs.

**Maintaining trustworthiness and attracting foreign investments**

There is no need to illustrate the fact that Indonesia's export performance has been crucial in enabling the country to maintain her international economic trustworthiness. It is very hard, however, to evaluate the extent to which Indonesia's exports have determined her ability to obtain loans. The fact that in spite of the continuing presence of deficit
in the balance of trades, loans were still made available to her in the second half of the 1960's was an indication that other considerations were as important to the creditors as Indonesia's capacity to export. How long such a situation will last, however, no one can say.

The extent to which foreign investors have been interested in Indonesia's export market oriented investment opportunities is a question which can only be answered with the help of data. The presence of companies like Unilever Brothers, Procter and Gamble, and British American Tobacco Ltd., all of which operate for the domestic market, is an evidence contrary to the statements made earlier. The presence of foreign oil companies that produce for both domestic and foreign markets may be considered as an indication that foreign investors are interested in both foreign market oriented and domestic market oriented investment opportunities.

During the last two years, Japanese, French, American, as well as other foreign companies, have shown interest in investing in the oil and forestry industries. Perhaps these companies have been induced by the ever-growing world demand for oil and wood products. If that is the case, then exports would have to be considered important in attracting private foreign investments into Indonesia.
Agricultural Contribution to Exports

For the purpose of the study, a description of the country's exports in agricultural products is desirable. The first part of this section will describe the structure of Indonesia's exports. In the second part, we will look at these exports in the light of the country's total exports.

Agricultural exports

The United Nations Statistical Office classifies agricultural export products into food, beverages and tobacco, raw materials, animal and vegetable oils and fats, and miscellaneous commodities. For convenience, this section will be organized according to this classification (54).

Food Indonesia's exports of food products are composed mainly of coffee, tea, and spices. The development of the exports of these commodities during the years 1960-69 is shown in Table 3.3.

In the years 1962, 1965, 1968, and 1969, the values of the exports of foods, expressed in US$ million, were 60.81, 65.58, 93.62, and 76.5, respectively. Data in Table 3.3 show that exports of tea, oilseed, cake and meal and others were much lower in 1969 than they were in 1968. And the value of food exports in 1969 was US$.72.9 million.

The share of each of the commodities in export earnings changed over time. In 1962, for instance, coffee contributed
Table 3.3. Exports of food in 1960-69, selected years

<table>
<thead>
<tr>
<th>Type of Crop</th>
<th>1962</th>
<th>1965</th>
<th>1968</th>
<th>1969</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W&lt;sup&gt;b&lt;/sup&gt;</td>
<td>V&lt;sup&gt;c&lt;/sup&gt;</td>
<td>W</td>
<td>V</td>
</tr>
<tr>
<td>Coffee</td>
<td>42.2</td>
<td>12.51</td>
<td>103.2</td>
<td>31.57</td>
</tr>
<tr>
<td>Tea</td>
<td>39.2</td>
<td>20.62</td>
<td>43.6</td>
<td>16.42</td>
</tr>
<tr>
<td>Spices</td>
<td>28.6</td>
<td>13.33</td>
<td>12.3</td>
<td>8.98</td>
</tr>
<tr>
<td>Oilseed, cake &amp; meal</td>
<td>109.7</td>
<td>3.39</td>
<td>125.3</td>
<td>3.91</td>
</tr>
<tr>
<td>Others</td>
<td>10.96</td>
<td>4.70</td>
<td>9.32</td>
<td>3.0</td>
</tr>
<tr>
<td>Total</td>
<td>60.81</td>
<td>65.58</td>
<td>93.63</td>
<td>72.9</td>
</tr>
</tbody>
</table>

<sup>a</sup>Source: (52, pp. 365-6, 394-5), (3, p. 110), (36, p. 183), and (15).

<sup>b</sup>Weight (W) in thousand tons.

<sup>c</sup>Value (V) in US$ million.
very little compared to tea and spices. In the course of the years, however, the exports of coffee had been growing. In 1968, for example, the value of coffee exports was more than the combined export value of the other two commodities.

The data in Table 3.3 indicate something encouraging. Compared to that of 1962, the export value of food in 1968 was more than 50 percent larger.

**Tobacco** During the period under study tobacco exports were as follows: 1962: weight, 11.4 tons, value, US$ 15.93 million; 1965: weight, 13.5 tons, value US$ 19.16 million; 1968: weight, 18.6 tons, value US$ 21.72 million; 1969: US$ 15.4 million.¹

The export earnings of tobacco increased significantly until 1968. Earnings from tobacco exports in that year were more than 30 percent higher than in 1962.

**Raw materials** The group of raw materials includes natural rubber, copra, and palm kernels. This group contributes the most to Indonesia's agricultural export earnings.

Within this group rubber exports have been the most important. The difference between the value of rubber exports and that of the other raw materials has been very large. In 1968, for example, earnings from rubber exports were almost five times as much as earnings from copra exports

¹Unless specified, the data employed in this section are obtained from the same source as those mentioned for Table 3.3.
Table 3.4. Exports of raw materials in 1960-69, selected years

<table>
<thead>
<tr>
<th>Type of Crop</th>
<th>1962 W</th>
<th>1965 W</th>
<th>1968 W</th>
<th>1969 W</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>Copra</td>
<td>109.9</td>
<td>123.5</td>
<td>250.0</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>14.4</td>
<td>17.9</td>
<td>39.9</td>
<td>13.8</td>
</tr>
<tr>
<td>Palm kernels</td>
<td>31.4</td>
<td>32.9</td>
<td>35.5</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>3.1</td>
<td>4.2</td>
<td>4.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Rubber</td>
<td>693.8</td>
<td>707.3</td>
<td>723.0</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>299.2</td>
<td>221.9</td>
<td>175.2</td>
<td>232.3</td>
</tr>
<tr>
<td>Others</td>
<td>7.1</td>
<td>4.7</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>324.1</td>
<td>244.1</td>
<td>224.5</td>
<td>250.2</td>
</tr>
</tbody>
</table>

*a Source: See Table 3.3.

*W = weight.

*v = value.
which were the second most important in the group. As can be observed from the table, 1968 was the best year for copra and the worst for rubber compared to the other years shown in the table.

During the period, each of the commodities in the group seems to follow a pattern of development different from those followed by the others. In the case of copra, for example, exports increased considerably until 1968. In that year its volume was only slightly less than 150 percent higher than in 1962; its value, however, was significantly more than 150 percent higher.

The volume of rubber exports also has shown a tendency to increase. The value of rubber exports, however, has declined considerably. In 1962, US$ 299.19 million were earned from the export of 693.8 thousand tons of rubber. In 1968, on the other hand, an export of 728.0 thousand tons of rubber earned only US$ 175.2 million. Thus, while the 1968 export volume was higher than that in 1962, the value was more than 40 percent less.

**Animal and vegetable oils and fats**  Palm oil is the only Indonesian export commodity that falls under this category. The development of palm oil exports during the years 1960-69 was about as follows: 1962: weight, 109.0 tons, value US$ 17.9 million; 1965: weight, 125.9 tons, value US$ 27.3 million; 1968: weight, 141.9 tons, value US$ 20.4
million; 1969: weight not available, value US$ 23.9 million.

The export volumes of palm oil increased until 1968. The value of exports varied. Although earnings in 1968 were higher than in 1962, they were lower than in 1965. Anyhow, compared to the earnings in 1962, those of 1968 were about 13.8 percent higher. In terms of its volume, however, the 1968 exports were almost 40 percent higher than those of 1962.

**Forest products** The development in Indonesia's exports of forest products, logs in particular, during the period 1960-69 has been phenomenal. In 1962 the exports of logs amounted only to US$ 1.47 million. In 1965, they earned 4.14 million. In 1968, the export value of logs was US$ 12.51 million, and in 1969, it jumped to US$ 33.3 million.

If exports of logs continue to grow at the same rates, it will not be long before this product becomes one of Indonesia's three top export commodities.¹

¹A recent estimate shows that timber will have become Indonesia's third most important export commodity this year. This year oil and rubber exports are expected to amount to US$ 444 million and US$ 258 million, respectively. Timber exports are expected to amount to US$ 110 million. (Net oil exports are expected to amount to only US$ 122 million (2, p. 5).
Agriculture and total exports

In 1960 agricultural commodities contributed 65.24 percent to the total exports. Since that year the contribution has been declining. This can be observed from Table 3.5 below. During the period 1960-69, Indonesia's total exports were, measured in US dollars, 840.5 million in 1960, 681.7 million in 1962, 707.7 million in 1965, 872.0 million in 1968, and 1,026.9 million in 1969. In each of those years agriculture contributed, respectively, 548.40 million, 420.39 million, 360.42 million, 400.15 million, and 428.20 million. In other words, agricultural contribution to the

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td>377.93</td>
<td>299.19</td>
<td>221.97</td>
<td>175.20</td>
<td>232.30</td>
</tr>
<tr>
<td>Agriculture</td>
<td>548.40</td>
<td>420.39</td>
<td>360.42</td>
<td>400.15</td>
<td>395.7</td>
</tr>
<tr>
<td>Petroleum and its products</td>
<td>220.76</td>
<td>215.80</td>
<td>271.80</td>
<td>239.60</td>
<td>380.00</td>
</tr>
<tr>
<td>Tin</td>
<td>55.57</td>
<td>34.90</td>
<td>37.92</td>
<td>48.00</td>
<td>55.70</td>
</tr>
<tr>
<td>Total</td>
<td>840.51</td>
<td>681.68</td>
<td>707.67</td>
<td>872.01</td>
<td>1,026.90</td>
</tr>
</tbody>
</table>

*Source: See Table 3.3.*
total exports in each of the corresponding years was 65.24 percent in 1960, 61.70 percent in 1962, 50.90 percent in 1965, 45.88 percent in 1968, and 38.54 percent in 1969.

The decline of agricultural contributions to total exports had, perhaps, been caused by three factors. The first is the continuing decline in the average values of rubber exports. The second is the increasing exports of petroleum products.¹ And the third is the increase in the exports of some other commodities.

Rubber exports It was shown earlier that rubber export values declined from US$ 377.93 millions in 1960 to US$ 232.30 millions in 1969. This decline, which amounted to an average annual decline of about 3.9 percent, affected agricultural exports considerably. Except for copra, whose export value in 1960 was about 4.05 percent less than its value in 1960, the values of the non-food commodity exports in 1969 were higher than those in 1960. And so was the case with the total value of the exports of food commodities. And yet, because of the decline in the exports of rubber, the total value of agricultural exports in 1969 was about 38.55 percent lower than in 1960.

The conditions of the exports of rubber seem to have improved since 1968. At least their value in 1969 was

¹ From now on the term "petroleum" will be used to refer to "petroleum and petroleum products."
significantly higher than in 1968. This improvement seems to be the reason, the most important one at least, why the total value of agricultural exports in 1969 was only 1.2 percent lower than in the previous year, even though the export proceeds from spices, palm oil, tobacco, and copra were significantly below those in 1968.

**Petroleum and its products** Exports of petroleum products dipped in 1962 and 1968. However, their exports in 1965 were more than 20 percent higher than in 1962. And in 1969 they were almost 40 percent above 1965.

Their share in total exports was 26.26 percent in 1960. In 1962 and 1965 these shares became 31.65 percent and 38.42 percent, respectively. In 1968 they were only 27.47 percent.

Indonesia's export conditions in 1969 must have been much better than in 1965. It was mentioned that the 1969 value of the exports of petroleum and its products was 40 percent higher than the 1965 value. Yet, in terms of their share in 1969 total exports, they composed only 36.64 percent, which was two percent lower than in 1965.

Rubber and petroleum have been dominant in Indonesia's exports. The trend of exports during the period under study seems to indicate that the dominance of these two commodities has tended to decline. In 1960 and 1962 rubber and petroleum jointly contributed 70.9 percent and 75.4 percent, respectively. In 1968 and 1969 their contribution declined
to 48.2 percent and 59.2 percent, respectively.

**Other commodities** Tin (ore and concentrate) is the mineral product whose contribution to exports comes second after petroleum. In 1960 its export value was US$ 55.7 million. After a low US$ 34.9 million in 1962, tin exports started to increase. In 1965 and 1966 its export value was US$ 37.3 million and US$ 48.0 million, respectively. And in 1969 it reached US$ 57.0 million, which was higher than in 1960. It should be noted that tin's contribution to exports was not more than ten percent in both 1968 and 1969. Its addition to the contribution made jointly by rubber and petroleum would not make the total contribution higher than, or even equal to, the joint contribution of rubber and petroleum in 1960 or 1962. This implies that the exports of commodities other than rubber, petroleum, and tin had been increasing.

Two conclusions may be drawn from the discussion presented in this section. One conclusion is that during the years 1960-69, the role of agriculture in Indonesia's exports declined. The second is that there has been a tendency for the commodity basis of the country's exports to broaden.

With respect to the first conclusion, the important question is whether it also implies that the role of agricultural exports in obtaining foreign exchange earnings had also declined. From the available data no answer can be
given to the question whether in obtaining foreign exchange earnings the role of agricultural exports had also been declining during the period 1960-69. This problem will, however, be discussed again later in this chapter and in Chapter Five.

Coffee, copra, forest products, palm oil, and rubber

This section is presented with the purpose of explaining the reason for limiting the study of agricultural exports, which will be made in the next chapter, to coffee, copra, forest products, especially logs, palm oil, and natural rubber.

A quick examination of the tables presented in this chapter so far would show that in the years 1962, 1965, 1968 and 1969 the joint contribution to total exports made by the five commodities mentioned above was, measured in US dollars, 345.76 million, 302.97 million, 292.29 million and 357.00 million, respectively. It has been observed that the total agricultural exports in those years were, measured in dollars, 420.39 million in 1962, 369.39 million in 1965, 400.15 in 1968 and 395.7 in 1969. A comparison of these two series of figures shows that the contribution to total agricultural exports made jointly by the five commodities whose exports are to be studied during the corresponding years was 82.06 percent in 1962, 84.06 percent in 1965, 73.04
percent in 1968, and 90.20 percent in 1969. Thus, except in 1968, which seems to be a very bad year for rubber, the contribution of the five commodities amounted to more than 83 percent of the total agricultural exports each year.1

Agricultural Exports and the Economy

The quantitative relationships of agricultural exports to the economy as a whole will be examined in the next section. Before looking into the quantitative relationships, however, a somewhat analytical discussion about the relationships might be very useful.

In order to appreciate the role of agricultural trade in the economic development of Indonesia, one should, perhaps be familiar with Johnston’s and Mellor’s previously mentioned article (23). The authors stated in the article that there are five ways in which increased agricultural output and productivity contributed to economic development (23, 571-72). First of all, agriculture has to expand food supplies in pace with growth of demand for the commodity. If agriculture failed to do so, economic development could

1A computation of the contribution of the five commodities in the years 1965, 1966, 1967, and 1968 showed that their combined contribution is on the average of 82.7 percent of the total agricultural exports. Based on this information, as well as on the one mentioned in the text, it will be assumed that the joint contribution of the five commodities will be 82 percent on the average.
be seriously impeded. Second, in the earlier stages of development, expansion of exports or agricultural products may be one of the promising means of increasing income and foreign exchange earnings. Third, "the labor force for manufacturing and other expanding sectors of the economy must be drawn mainly from agriculture." Fourth, being the dominant sector of an underdeveloped economy, agriculture can and should make a net contribution to the capital required for investments. Fifth, rising net cash incomes of the farm population may be necessary to stimulate industrial expansion.

Agricultural exports contribute, at least, in four of the five mentioned ways to Indonesia's economic development. To avoid the risk of getting too repetitive on certain points the discussion in this section will be confined to two of them. The two ways to be discussed are, 1) its contribution to income and foreign exchange earnings; and 2) its contribution to the capital required for investments.

**Increasing income and foreign exchange earnings**

Agricultural exports are not as important to Indonesia as to the countries whose exports consist mainly of agricultural commodities. In spite of her exports of mineral commodities, however, agricultural exports occupy a very important place both as an income generator as well as a foreign exchange earnings contributor. This is what will be
Increasing income Indonesia's agricultural exports consist mainly of copra, rubber, palm oil, palm kernels, coffee, spices, and tropical hardwood. The importance of these exports cannot be fully explained by the theory of comparative advantage.¹ These commodities are exported mainly because the country has an over-abundance of the commodities. In other words, if there were no foreign markets for the exportable amounts of the goods, they would be useless. Their marginal value would be zero or even negative. How serious the situation would be if suddenly the country had to stop exporting all the exportable amounts of her agricultural commodities could be evaluated from the fact that in the case of rubber, for example, the annual average exportable amount is more than 90 percent.

Several factors explain why there should be an over-abundance of export commodities in the absence of foreign

¹Hla Myint has shown that the "comparative cost is largely inapplicable in underdeveloped countries..." (31, pp. 272-3). "The comparative cost theory assumes that the resources of a country are given and fully employed before it makes international trade. The function of trade is then to reallocate its given resources more efficiently between domestic and export production in the light of the new set of relative prices now open to the country. The function of (international) trade...(in a developing country) is...to provide...effective demand for the output of the surplus resources which would remain unused in the absence of trade" (30, p. 321).
markets. Under the given conditions these factors can be explained by looking at their effects on the demand for the exportable commodities. The demand for Indonesia's major export commodities may be formulated as follows:

1) \( D^R = Q^R + (E - aP^R) \)

2) \( D^C = q + (C - bP^C_j) + (E - eP^C) \)

3) \( D^k = q^k + (E - fP^k) \)

where:

- \( D \) = total demand;
- \( Q^R \) = total domestic demand for rubber or palm oil under the present stage of industrial development;
- \( Q^k \) = total domestic demand for coffee, tea or spices under the present preference system, income and population condition;
- \( E \) = total quantity demanded abroad if the export price is zero;
- \( P \) = export price; \( P^C_j \) = the price of the exportable commodities in the domestic consumers' centers;
- \( C \) = total quantity demanded of the exportables in the domestic consumers' areas if their prices were zero, under the given preference system, per capita income and population;
q = the local demand for exportable copra or hardwood timber under the given local preference, income per capita and population conditions;

and superscripts:
- c = exportable copra or hardwood timber;
- k = exportable coffee, tea, or spices;
- r = rubber or palm oil.

In the absence of export markets $D^r$ would just equal $q^r$. Under the present condition, $Q^r$ is not more than five percent of the total production in the case of rubber, and about 21 percent in the case of palm oil.

In the case of copra or hardwood timber, the absence of foreign markets would make the demand for either of the two commodities equal to:

$$D^c = q + (C - bP_j^c).$$

As one should expect, the local price of the exportable copra or hardwood timber in the consumer centers is a function of the production costs in the production centers, $p$, plus the marketing margins, $M$, and the transportation costs, $T$, per unit of the commodities. In other words:

$$P_j^c = P_j^c(p, T, M).$$

Under the present conditions, however, $T$ and $M$ are very
high. Hence, even in the absence of exports, \( P_j^c \) is high. \( P_j^c \) could even be infinitely high if the required transportation means is not available for a too long period. Consequently \( (C - bP_j^c) \) is very small, or, in the absence of transportation means, zero. Thus, under the prevailing conditions, the absence of foreign markets for either copra or hardwood timber would mean that \( D^c \) would be close to or equal to \( q \). And in such a situation, the marginal value of the exportable surplus of either copra or timber would be zero or negative.

In the quantitative formula, the difference between (1) and (3) is not very obvious. One should keep in mind that \( Q^r \) in (1) would increase as the country's industrial capacity rises. A rise in the country's industrial capacity would affect \( Q^r \) directly and indirectly. The first effects would come from the expansion of the rubber industry and the others which employ palm oil as input. The second, from the increase in the demand for rubber and other products due to the rise in domestic per capita income.

A rise in the country's industrial capacity would, however, not directly increase the domestic demand for coffee or tea, \( Q^k \). And, due to the low saturation point of coffee, tea, and spice consumption, the possible increase of demand for coffee, tea, and spices due to the rise in per capita income may not be very significant. Hence, unlike in the
case of $Q^r$, a rise in the country's industrial capacity may not affect $Q^k$ significantly.

To summarize, due to the low stage of industrialization and low degree of interregional and inter-island mobility, the only way the exportable quantities of Indonesia's agricultural commodities can obtain positive marginal value, and hence contribute to income, is by being exported. Under the present industrial and transportation conditions, the opportunity costs of exporting most of Indonesia's agricultural commodities are zero or negative. It should be noted that this zero or negative opportunity cost conditions of exports are absent in the industrialized and other advanced countries, or otherwise they can be overcome within a very short period.

**Foreign exchange earnings** It has been observed that since 1960 the agricultural contribution to the total exports had proportionally been decreasing from 65.2 percent in 1960 to 40.5 in 1968. The decline should not be taken as an indication that agricultural exports will lose their importance in Indonesia's economy within the foreseeable future. For one, there is no definite indication that in absolute terms their contribution to exports has been declining. Moreover, even if the share in exports has been falling, the share in foreign exchange earnings may not decline in the immediate future.
Foreign investments play a very important role in Indonesia's mineral sector, especially in the oil industry. Furthermore, as pointed out by Goreux (18, p. 55), the technology in the mineral industry is such that the required capital equipment as well as technical and managerial skills are largely imported. Consequently, a significant portion of the export proceeds, parts of the expenditures on salaries and all investment incomes, has to be sent abroad. In other words, a large part of the foreign exchange which results from the exports of mineral products will not accrue to the country.

Being aware of these problems, as it will be shown later in this work, the planners of Indonesia's present five-year plan have anticipated that the foreign exchange earnings\(^1\) from the exports of petroleum will be by far smaller than their expected export proceeds.

**Capital for investments**

Assuming, perhaps, that the agricultural sector of an underdeveloped country is a fairly homogeneous entity, Johnston and Mellor stated that "The sheer size of the agricultural sector as the only major existing industry points to its importance as a source of capital for overall

\(^1\)Throughout this work foreign exchange earnings are defined as export proceeds minus the costs of production and marketing which have to be paid in foreign exchange.
economic development"¹ (23, p. 581). In order to be applicable to Indonesia, this statement requires some elaboration.

To facilitate the discussion, Indonesia's agricultural sector will be divided into four sectors in this section:

1) The food production sector;
2) the commercial crop production sector;
3) the domestic agricultural marketing sector, and
4) the export agricultural marketing sector.

It has been observed that the food production sector is a subsistence sector. One may claim that the probability that this sector will make a significant contribution to capital accumulation is very small. It is hard to expect a significant contribution to capital for investments from a group of farmers whose average land-holdings are about one hectare.

¹In a more recent writing, Mellor elaborated these arguments. The most important of the later arguments is perhaps his contention that "... the rural sector, ... is characterized by considerable income disparities" (28, p. 84). To the present writer the essential point that was not mentioned by Mellor even in the later arguments is the fact that there is a significant marketing sector in most developing countries' agriculture, while this is the sector which is in the position to squeeze whatever "surplus" is there in the agricultural sector. See also (39).

Fei and Ranis have taken account of this fact. Thus, they mentioned four economic functions to be performed in an open agrarian economy: 1) acquisition of the labor force; 2) production of exportable goods, 3) successful sale in the export market, and 4) accumulation of commercial capital (7).
In the commercial crop production sector, the probability for savings to take place and for capital to accumulate should be much higher. In this sector there are the plantation farmers whose average land holding is not far below 1,000 HA per farmer. In addition, most of the plantation farmers earn income from exporting their products. Even the small holders in this sector usually are wealthier than the food producers. This is especially true in the case of rubber and copra producers. It is also true in the case of certain tobacco growers in certain areas where the average landholdings are not much larger than that of the food producers.

The largest shares of savings should, however, be expected from the agricultural marketing sector. It was observed in Chapter Two that the per capita income in the trade sector was, aside from the mining sector, highest. This sector includes exporters, who at the same time are also importers, and wholesalers as well as petty traders who purchase agricultural products in small quantities from villagers and small retailers who have to peddle their wares from house to house. The income distribution in the sector is very unequal with the exporters and wholesalers in the highest brackets.

A question may be raised whether the fact that per capita income is highest in the mining sector should not
indicate that contribution to capital for investments should not be expected mostly from the mining sector.

In the past the mining sector, especially the oil sub-sector, proved to be the most important source of capital for internal investments. One may expect that that situation will continue in the future. It may also be expected that the mineral sector should also be an important source of capital for government investments. Foreign companies pay royalties and share profits with the government. For private investments outside the mineral sector, however, it is doubtful that the mining sector can be expected to become an important source of capital.

It should be recalled, for example, that in spite of its large contribution to exports and the high income per capita, the mining sector contributed only 4.1 percent to the total GDP, or about 25 percent of the contribution made by the trade sector. Moreover, as has been pointed out earlier, a significant portion of the income generated in the sector goes to foreigners. Thus, there are certain facts which compel one to believe that the total share in the GNP generated in the sector is too low to allow the mineral sector to contribute significantly to capital for private investments outside the sector. In addition to this problem, which may be considered quantitative in nature, there is a qualitative problem involved.
Most of the Indonesians who belong to the higher income group in the mining sector tend to be more "consumption minded" rather than "investment minded". Their average as well as marginal propensity to consume is high and hence they are not likely to contribute significantly to capital for investments.

The higher income group in the agricultural marketing sector, on the other hand, includes largely people who are more inclined to make money than consume what they possess. They are businessmen, and accordingly their average and marginal propensity to consume is lower. It may, perhaps, also be stated that if there are entrepreneurs in the Indonesian society, most of them are found in the agricultural marketing sector.

These facts lead to the conclusion that, together with the domestic agricultural marketing sector in the economy, Indonesia's agricultural export sector is most likely to be the sector which has the potential to contribute most to private capital accumulation.

Estate vs. small-holder commercial agriculture

The estate and the small-holder commercial production sectors are both commercial. Hence, profit motive plays an

\footnote{For the purpose of the following discussion, forestry may be considered as estate agriculture.}
important role in determining the activities of the farmers concerned.\(^1\)

With respect to their ability to make a contribution to economic development, the two sectors are, however, not in the same position. The effects of the activities in the plantation sector on economic development are, perhaps, more closely similar to the effects of the activities in the mining sector. Due to the organization of both the production and marketing process in the plantation sector, which are different from the one employed in the small-holder sector, there is more inequality in the distribution of income in the former than in the latter. Theoretically that should imply a higher marginal propensity to save in the plantation sector. However, the consumption behavior of the higher income group in the plantation sector is generally such that it makes the average and marginal propensity to consume imported goods in the sector higher than in the small-holder sector. Consequently, the estate sector cannot be expected to be able to contribute significantly to the expansion of effective demand for domestically produced goods. Furthermore, the effects of their contribution to capital for investments, which are favorable to economic development,

\(^1\)The following discussion is based primarily on Douglass C. North's ideas (34, pp. 72-4).
are offset by their higher average and marginal propensity to consume imported goods. Any import of consumers' goods intended to satisfy their demand reduces the capacity of the country to import capital and intermediate goods required for investments.

The presence of state-owned plantation farms adds to the problems prevailing in the sector. As it was mentioned previously, the average and marginal propensity to save in the private sector should be expected to be high. The higher income group in the sector are business men. In the state-owned sector, however, the average as well as the marginal propensity to consume tends to be high. This is due to the fact that the higher income people in the state-owned sector are largely more bureaucrat-oriented rather than businessman-like. It may thus be reasonable to state that, assuming the same efficiency in the private and in the state-owned plantation farms, the average and marginal propensity to save in the plantation sector will be smaller the higher the ratio between the number of the state-owned plantations and that of the private ones.

The discussion presented in this section should not necessarily lead to the conclusion that the estate agricultural sector will not be able to contribute anything to capital for investments. Savings should be taking place in the private sector. Assuming there is demand for capital, these savings should be available.
It is very unlikely that state-owned plantations are in the position to contribute significantly to capital for private investments. Assuming that they are managed efficiently, however, they should be able to contribute to capital for public investments. Legally any profits they make should accrue to the government. The extent to which this sector will be able to contribute to public investments depends largely on the government's ability to limit the tendency to raise the plantation managers' and the workers' shares in the profits made in the sector.

A Model for Indonesia's Nineteen Sixties' Economy:
A Quantitative Examination

The model presented here is a very simple version of a Keynesian demand-oriented model. It is built mainly on the basis of data contained in a ten-year annual time series of national account available in Nota Keuangan, or "Financial Memorandum", published by the Indonesian Treasury Department (36, p. 200). In addition, data available in certain United Nations publications also have been utilized.¹ In order to be able to utilize the latter data without causing internal inconsistencies, certain adjustments affecting the

¹Anyone working on Indonesia must be surprised to find out how little information on Indonesia the United Nations Statistical Office has relative to the amount of information on other countries the office possesses.
former ones have to be made. The data are presented at 1960 price levels.

The model

The method of two-stage least squares has been employed for the estimation of the coefficients. Thus $Y$, $CP$, and $I$ are first regressed on the other variables excluding $P^*$. Then $CP$ is regressed on $Y$-hat and $P^*$, and $I$ on $CP$-hat, $E^a$, $E_{t-1}^a$, $E_{t-1}^a$, and $M$. The reduced form is derived from this three-equation system.

The variables

The variables in the model are: GDP or gross domestic product, private consumption, government consumption, gross investments, current exports of agricultural products, current exports of non-agricultural products, current exports of agricultural products, previous year agricultural exports, previous year non-agricultural exports, imports, government consumption, and inflation rate.

---

The symbols used in the model are the following:

- $Y = \text{gross domestic product}$
- $CP = \text{private consumption}$
- $I = \text{investment}$
- $E^a = \text{agricultural exports}$
- $E_{t-1}^a = \text{previous year agricultural exports}$
- $EO = \text{non-agricultural exports}$
- $E_{t-1}^o = \text{previous year non-agricultural exports}$
- $M = \text{imports}$
- $C^G = \text{government consumption}$
- $P^* = \text{inflation rate}$
exports of agricultural products lagged one year, exports of non-agricultural products lagged one year, imports, and rates of inflation which is defined as

\[ \frac{1}{p} \frac{dP}{dt} \quad \text{where } p \text{ represents } P_{t-1}. \]

For the purpose of the study, which is to investigate the effects of agricultural exports on the other sectors of the economy, one may wish to have at least five variables, \( Y, C^P, I, E^O, \) and \( M \), to be endogenous. Several equations in which \( E^O \) as well as \( M \) were assumed to be the dependents were tried. The results were very poor. And, hence, making only \( Y, C^P, \) and \( I \) endogenous in the system seems to be the only alternative to the simpler one in which two or less variables are assumed to be endogenous.

Assuming \( E^O \) to be exogenous does not need any justification. It is very likely that Indonesia's exports of non-agricultural commodities during the 1960's were determined by external factors like government policies, inflation, and foreign market conditions. The assumption of \( M \) to be exogenous, however, needs explanation. Theoretically imports should be a function of income. During the 1960's, foreign trade was tightly controlled by the government. The government had policies, and often changed them, which were intended to limit the expenditures on the imports of certain goods to be equal or lower than the amounts of foreign
exchange which could be made available for the purpose.¹

The government had quota policies, surcharge policies, discriminatory foreign exchange rate policies and others during the sixties.

Besides limiting the amounts and values of the imports of certain goods, these measures have the effect of determining the total values of imports annually. Thus it is very likely that to a very high degree Indonesia's imports during the 1960's were determined by government policies rather than by income. This makes it reasonable to assume that \( M \) is an exogenous variable.

Besides non-agricultural exports, \( E^o \), and imports, \( M \), the other autonomous variables are thus government consumption, \( C^g \), agricultural exports, \( E^a \), rates of inflation, \( P^* \), and, of course, \( E_{t-1}^a \) and \( E_{t-1}^o \). There are thus three endogenous and seven exogenous variables in the model.

A very important note has to be made before any further discussion is presented.

It was mentioned that the model is built on the basis of a ten-year annual time-series data. Statistically the number of observations are thus too small for the coefficients of the regression equations to be very meaningful.

¹Bruce Glassburner mentioned several problems with respect to Indonesia's foreign exchange pricing system. One of them is: "overcomplication of the tariff structure" (17, p. 173).
For lack of data, there is at present nothing that can be done to remove this statistical shortcoming of the model. It is hoped that in a not-too-distant future something can be done to improve or reconstruct the model introduced here.

The equation system

The following equation system composes the model. For convenience subscript \( t \) is omitted.

1. \( Y = C^P + C^G + I + E^a + E^o - M \)

2. \( C^P = c_1 + a_1 Y + b_1 F^* \)

3. \( I = c_2 + a_2 C^P + b_2 E^a + b_3 E^a_{t-1} + b_4 E^o_{t-1} + b_5 M \)

Only the first equation is an identity. The other two are behavioral. Certain notes on each of the three equations may be useful.

\( Y \) in the income identity represents GDP rather than GNP or disposable income. Not enough information is available to obtain Indonesia's disposable income in the sixties. The necessary adjustments on the data mentioned previously have made it inadvisable to make use of the available data on GNP. It is unnecessary to mention that the use of GDP instead of either GNP or disposable income may make the model less useful than otherwise would have been the case.

Inflation rate, \( F^* \), has been incorporated in the consumption function. The addition of \( F^* \) in the equation has raised the correlation coefficient of the regression from
0.767 to 0.818 and the calculated t-value associated with Y from 5.226 to 5.760. It will be noticed, though, that the calculated t-value associated with $P^*$ itself is less than 2.306 which is the minimum value for the regression coefficient to be statistically significant at the five percent level.

There are indications that international demonstration effects have strongly influenced Indonesia's consumption pattern. For example, a certain group of people are getting less and less willing to go to work by bicycle; sons and daughters of higher officials ride around in luxury cars. Other youngsters drive Japanese motorcycles. The government built various luxury hotels in spite of the lack of occupants and constructed a stadium for international games in spite of foreign exchange shortage for development purposes. The consumption function presented in the system ignores these indications.

It has been mentioned that $I$ represents gross investments rather than net investments. In addition, it may also be mentioned that since changes in stocks are not shown in the income identity, $I$ should be assumed as including those changes.

The estimation of the regression coefficients has resulted in the following equation system:

4. $Y = C^D + C^E + I + E^a + E^o - M.$
5. \( CP = 61.066 + 0.70823Y - 0.03284P^* \) \( R^2 = 0.8183 \)
\((54.643) \ (0.12295) \ (0.01812) \) \( d = 2.4752 \)

6. \( I = 7.1047 - 0.08675G^P + 0.92725E^a \) \( R^2 = 0.9806 \)
\((11.519) \ (0.12295) \ (0.1795) \) \( d = 2.7028 \)

\( - 1.01527E^a_{t-1} + 1.53561E^0_{t-1} \)
\((0.2726) \ (0.2902) \)

\( + 0.5138M \)
\((0.1533) \)

The points to be observed about the system are:

1) The standard error of the regression coefficient associated with \( P^* \), as well as the one associated with \( CP \), indicate that the corresponding t-value would be lower than the ones which would make the coefficient significant at the five percent level.

2) The values of the correlation coefficients are 0.8183 and 0.9806.

3) The Durban-Watson statistic associated with equation 5 is 2.4752, and the one associated with equation 6, is 2.702. Statistically speaking the one for equation 5 indicates that there is no serial correlation within the data. The one associated with equation 6, however, indicates that
there may be serial correlations in the data.\textsuperscript{1}

After all the dependent variables have been transferred to the left-hand side of the equations, the system can be presented in the following matrix form:

\[ Ay = Bx + c, \]

where:

\[
A = \begin{bmatrix}
1 & -1 & -1 \\
-0.70823 & 1 & 0 \\
0 & 0.08675 & 1
\end{bmatrix}
\]

\[
y = \begin{bmatrix}
Y \\
\text{ICP} \\
I
\end{bmatrix}
\]

\[
B = \begin{bmatrix}
1 & 1 & 1 & -1 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & -0.03284 \\
0 & 0.92725 & 0 & 0.51381 & -1.01527 & 1.53561 & 0
\end{bmatrix}
\]

\textsuperscript{1}From the Durban-Watson table it is clear at five percent level of significance that for a regression equation with 15 observations, \(d\) should be less than 1.54 for an equation with two independent variables and less than 2.21 for an equation with five independent variables to indicate the presence of serial correlations. The model is built on ten observations. The limit for the indication of the presence of serial correlation is less than 1.54 for an equation with two independent variables and may be higher than 2.21 for an equation with five independent variables. See Carl F. Christ, Economic Models and Methods, John Wiley & Sons, Inc., New York, London, Sydney, p. 672.
The reduced form of the model can then be derived from the above matrix, as shown in Table 3.6.

Based on this reduced form of the model, it is possible to project Indonesia's GDP, private consumption, and investment in a certain year. Using $Y_k$ to represent $Y$, $C^p$ or $I$; $X_i$ to represent $C^e$, $E^a$, $E^o$, $M$ or $P^*$; and $X_j$ to represent $E^a_{t-1}$ or $E^o_{t-1}$, the projection may be obtained by applying the formula:

$$Y_k = c_k + \sum_{i=1}^{n} b_{ik} X_i + \sum_{j=1}^{m} b_{jk} X_j$$

$k = 1, 2, 3$; $i = 1, 2, \ldots, 5$; $j = 1, 2$;

$n = 5$; $m = 2$.

where $c_k$ represents the constants associated with $Y_k$ and $b_{ik}$ and $b_{jk}$ the matrix coefficients associated with the autonomous variables.

Economic interpretations will be given to several
Table 3.6. The reduced form of the model

<table>
<thead>
<tr>
<th></th>
<th>$c^*$</th>
<th>$E^a$</th>
<th>$E^o$</th>
<th>$M$</th>
<th>$E^a_{t-1}$</th>
<th>$E^o_{t-1}$</th>
<th>$p^*$</th>
<th>$c$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Y$</td>
<td>2.8312</td>
<td>5.4564</td>
<td>2.8312</td>
<td>-1.3765</td>
<td>-2.8744</td>
<td>4.3476</td>
<td>-0.0809</td>
<td>178.006</td>
</tr>
<tr>
<td>$C^p$</td>
<td>2.0051</td>
<td>3.8644</td>
<td>2.0051</td>
<td>-0.9749</td>
<td>-2.0357</td>
<td>3.0791</td>
<td>-0.0990</td>
<td>187.135</td>
</tr>
<tr>
<td>$I$</td>
<td>-0.1739</td>
<td>0.5920</td>
<td>-0.1739</td>
<td>0.5934</td>
<td>-0.8387</td>
<td>1.2685</td>
<td>0.0008</td>
<td>-9.129</td>
</tr>
</tbody>
</table>
relationships shown by the model. Before doing so, however, it is necessary to evaluate the extent to which it reflects Indonesia's economic structure during the nineteen sixties.

**The "representative" value**

Two approaches will be followed in evaluating the extent to which the model represents Indonesia's economy in the sixties. One is what perhaps may be called the common sense approach, and the other is the inequality measure approach (45, 31). For both approaches the values of the residuals, obtained from a comparison between the observed values of the three dependent variables and the ones projected are used as the starting point.

From Appendix 4 one observes that the absolute values of the residuals $Y - \hat{Y}$, $C_P - \hat{C}_P$, and $I - \hat{I}$ and their percentage values in terms of the observed values of the variables are as found in Table 3.7.

It may be assumed, perhaps, that a residual of less than three percent can be classified as good, that of three percent or higher but less than five percent as fair, and that of five percent or more as poor. Based on such a criterion one may then make a judgment on the model.

The average residual of the model is 3.55 percent for income, 3.71 percent for consumption, and 4.91 percent for investments. This implies that, based on the above criterion, the model is only fairly representative of the 1960's
Table 3.7. The residuals of the predicted values of the GDP, private consumption, and investments in 1960-69 over their actual values

<table>
<thead>
<tr>
<th>Years</th>
<th>( Y - \bar{Y} ) Absol. value</th>
<th>( Y - \bar{Y} ) % of ( Y ) value</th>
<th>( CP - \bar{CP} ) Absol. value</th>
<th>( CP - \bar{CP} ) % of ( CP ) value</th>
<th>( I - \bar{I} ) Absol. value</th>
<th>( I - \bar{I} ) % of ( I ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>27.6</td>
<td>6.67</td>
<td>8.1</td>
<td>2.41</td>
<td>4.3</td>
<td>9.75</td>
</tr>
<tr>
<td>1962</td>
<td>9.4</td>
<td>2.35</td>
<td>20.3</td>
<td>5.65</td>
<td>2.1</td>
<td>5.23</td>
</tr>
<tr>
<td>1963</td>
<td>3.1</td>
<td>0.75</td>
<td>0.7</td>
<td>0.20</td>
<td>2.2</td>
<td>7.18</td>
</tr>
<tr>
<td>1964</td>
<td>34.3</td>
<td>8.06</td>
<td>27.5</td>
<td>7.90</td>
<td>1.4</td>
<td>4.02</td>
</tr>
<tr>
<td>1965</td>
<td>20.0</td>
<td>4.65</td>
<td>13.6</td>
<td>3.82</td>
<td>0.3</td>
<td>0.82</td>
</tr>
<tr>
<td>1966</td>
<td>11.0</td>
<td>2.48</td>
<td>3.7</td>
<td>1.05</td>
<td>1.6</td>
<td>3.93</td>
</tr>
<tr>
<td>1967</td>
<td>18.0</td>
<td>4.01</td>
<td>25.6</td>
<td>6.7</td>
<td>3.7</td>
<td>11.14</td>
</tr>
<tr>
<td>1968</td>
<td>13.1</td>
<td>2.73</td>
<td>14.1</td>
<td>3.55</td>
<td>0.2</td>
<td>0.43</td>
</tr>
<tr>
<td>1969</td>
<td>1.2</td>
<td>0.23</td>
<td>8.8</td>
<td>2.08</td>
<td>0.9</td>
<td>1.66</td>
</tr>
</tbody>
</table>

economic structure.

Going through the residuals for each of the variables, one would find out that the residuals vary from one year to another. Thus for income, five of the nine projections are good, two are fair, and two are poor. For consumption, four are good, three are fair, and two are poor. And for investments, only three are good, two are fair, and four are poor.

The inequality measure approach is essentially a method which employs the following form to evaluate the predictive value of a model (45, p. 31).
9. \[ U = \sqrt{\frac{1}{n} \left( \frac{1}{n} \sum_{i=1}^{n} (P_i - A_i)^2 \right)} \]

\[ 1 = 1, 2, 3, \ldots n \]

\( P_i \) in this form represents the predictive value of a dependent variable, and \( A_i \) represents the actual or the observed value. A model would be entirely worthless if \( U \) is equal to 1.0. And it would be perfect if \( U \) is equal to 0.0. For most models, the value of \( U \) is thus larger than 0.0 but less than 1.0.

The value of \( U \) in the simple model presented in this subchapter is:

10. \[ U_M = \sqrt{\frac{1}{9} \left( 5,466.86 \right)} \]
\[ \left( \sqrt{\frac{1}{9} \left( 2,976,354.49 \right)} + \sqrt{\frac{1}{9} \left( 2,902,333.04 \right)} \right) \]
\[ = 0.0215. \]

Its representative value in reflecting the income, private consumption, and investment relationships in the sixties are, respectively:

11. \[ U_Y = \sqrt{\frac{1}{9} \left( 3,054.17 \right)} \]
\[ \left( \sqrt{\frac{1}{9} \left( 1,730,865.7 \right)} + \sqrt{\frac{1}{9} \left( 1,749,871.6 \right)} \right) \]
\[ = 0.0209. \]
12. \[ U_C = \sqrt{\frac{1}{9} (2,364.2)} \]
\[ \sqrt{\frac{1}{9} (1,371,767.7) + \sqrt{\frac{1}{9} (1,773,252.1)}} \]
= 0.0194.

13. \[ U_I = \sqrt{\frac{1}{9} (46.4)} \]
\[ \sqrt{\frac{1}{9} (14,874.9) + \frac{1}{9} (14,828.7)} \]
= 0.0279.

Equations 10 - 13 show that the inequality measure values are low.

The discussion on the representative value of the model should have been sufficient to show the limitations which characterize the model. The economic interpretations presented in the following section should be understood with due considerations to those limitations.

**Economic interpretation of the model**

This section is an attempt to provide a better understanding of Indonesia's economic structure. Due to the statistical weakness mentioned previously, however, the suggestions made in this section must be interpreted with caution for policy purposes.
Government consumption  The reduced form of the model shows that the only way government consumption, C^g, adds to income is through its effects on consumption. Its effects on investment are negative. This means that government consumption in the 1960's did not have any positive effect in stimulating productivity increases. The size of the negative effect on investment is such that an increase of 100 rupiah in government consumption resulted in a decrease of about seventeen rupiah in investment.

The policy implication of the relationship is that as long as Indonesia's economic structural relationships remain as they were in the sixties, the government should keep routine expenditures to their minimum in order to promote the country's economic development. This conclusion, however, does not preclude the possibility that a change in their composition may render government expenditures conducive rather than hampering to economic development.

Agricultural exports  Mathematically speaking current and previous year agricultural exports, E^a_t and E^a_{t-1}, are two different variables. Nevertheless, it seems impossible economically to talk about one of the variables, E^a_t and E^a_{t-1} or E^0_t and E^0_{t-1}, without referring to the other.

Current agricultural exports affect the three endogenous variables, GDP or Y, private consumption, C^p, and investment, I, in a positive way. Thus a one rupiah increase in
current agricultural exports causes an increase of about 5.5 rupiah in GDP, 3.9 rupiah in private consumption, and 0.6 rupiah in investment. However, previous year agricultural exports have negative effects on all of the three variables. Thus the reduced form of the model shows that every rupiah of the previous year agricultural exports causes a reduction of about 1.9 rupiah in income, 2.0 rupiah in consumption, and 0.8 rupiah in investment. The previous year export negative effects on income and private consumption are smaller than the current export positive effects on the two variables. Hence, as long as the current exports are not significantly smaller than the previous ones, the net agricultural export effects on the two variables are positive. Previous year per rupiah agricultural effects on investment, however, seem to be larger than the current year per rupiah effects. This implies that the net agricultural export effects on investment are negative unless \( E_t^a \) is significantly larger than \( E_{t-1}^a \). This relationship seems to result from the fact that the absolute value of the regression coefficient associated with \( E_{t-1}^a \) in the investment equation, equation 6 on page 102, is larger than the coefficient associated with \( E^a \). The former is 1.015 and the latter is 0.927. This, in turn, may reflect the possibility that the depreciation in the agricultural export sector during the 1960's was larger than the gross investments.
As far as the model can show, there is a tendency for investment to fall as agricultural exports increase. This seems to be consistent with statements made in certain reports that replanting in the plantation as well as small-holder farms lagged significantly behind the deterioration process that has been taking place.¹ This problem perhaps is related to the farmers' revenues. The prices they received in the sixties may have been too low to make replanting on their farms desirable. If such a situation prevails in the future, it should be expected that in the long-run, agricultural exports will continue to decline both in terms of their values as well as in terms of their volumes. However, such a possibility should not preclude the possibility that the present export commodity producers would make investments in other enterprises, within or without agriculture.

One may raise a question why current agricultural exports have positive relationships with the three dependent variables but previous year agricultural exports have negative relationships with them. The different relationships

¹In 1965 there were in the rubber estate sector about 280,000 HA of areas (the total rubber estate area was about 510,000 HA) in which the trees were 37 years old (40, 38). And it was estimated that 70% of small-holder rubber trees were 35 years old, and 50% of the coconut trees in the country were 50 years old in 1968 (41, pp. 223, 239).
may possibly be explained as follows.

On the average Indonesia's GDP had kept increasing in 1960-69. Agricultural export values, on the other hand, showed a tendency to fall during the first six years of the period. This inverse relationship is not shown in the coefficient relating $E^a$ and each of the three dependent variables. However, it is shown by all the three coefficients relating these three variables to $E^{a}_{t-1}$. The question is: Why should the negative effects of an increase in agricultural exports on GDP and private consumption lag one year?

The galloping inflation may have been one of the factors that prevented the fall in revenues from agricultural exports, which exporters and producers received in rupiah, and their consumption from being known within the current year. Under the inflation it must also be impossible to find out the decline in the real value of investments in the current year. Thus the declines in the real value of income received from agricultural exports and in the real value of its consumption, as well as the decline in the real value of investment were known only after the inflation rate in the year $t-1$ had been calculated.

Due to some reason mentioned earlier, the negative coefficient relating $E^a_{t-1}$ to investment is larger than the one relating the latter variable to $E^a$. This may raise the question as to why the negative coefficients relating $E^a_{t-1}$ to $Y$
Il4

and C^t should not be larger than the positive coefficients relating E^a to the two independent variables. The increasing tendency of the agricultural export revenues in the last four years seems to be too small to justify the fact that the latter coefficients are larger than the former ones.

Perhaps the fall in the export receipts accruing to the producers and exporters of the agricultural export commodities in terms of their real values were not as much as their fall in the exports valued in dollar terms. The real values of the revenues accruing to the producers and exporters were partly determined by the rupiah values of the commodities on which the income earned from agricultural exports were spent. One should not preclude the possibility that what producers and exporters of agricultural export commodities lost due to the fall in the commodities' export values were more than offset by what they gained from the domestic terms of trade between agricultural export commodities and the goods on which the rupiah export revenues were spent.

**Non-agricultural exports** The relationships of current non-agricultural exports to the three endogenous variables are shown to be exactly similar to those of government consumption. But previous year non-agricultural exports, E^0_t-1, are shown to be having very significant
effects on current GDP, private consumption and investment, \( Y_t, C_t^P \), and \( I_t \). Each rupiah increase in \( E^O_{t-1} \) causes an increase of about 4.3 rupiah in \( Y_t \), 3.1 rupiah in \( C_t^P \), and about 1.3 rupiah in \( I_t \). It may be noted that \( \Delta Y_t \) is equal to about 2.8 \( E^O_t \) + 4.3 \( E^O_{t-1} \), and \( \Delta C_t^P \) is equal to about 2.0 \( E^a_t \) + 3.1 \( E^O_{t-1} \). One may compare the latter, \( \Delta C_t^P \), to its equivalent in agricultural exports which was 3.9 \( E^a_t \) - 2.0 \( E^a_{t-1} \). The net effects of a rupiah change in non-agricultural exports on private consumption is thus much higher than that of a rupiah change in the agricultural sector. This seems to be consistent with the previous statement that the average, as well as marginal, propensity to consume of the Indonesians who belong to the higher income group in the mining sector is too high to enable the sector to contribute significantly to capital for private investment outside the mining sector.

Another important difference between the agricultural and non-agricultural exports is that while the effects of \( E^a_{t-1} \) on \( I_t \) are negative, the effect of \( E^O_{t-1} \) on \( I_t \) is positive. Thus, \( \Delta I_t/\Delta E^O_{t-1} \) is about 1.3. Comparing this to \( \Delta I_t/\Delta E^a_t \), one may conclude that generally an increase in non-agricultural exports would have positive effects on investments.

**Imports** The reduced model shows that a one-rupiah increase in imports would reduce income by about 1.4 rupiah and private consumption by about 0.97 rupiah, but would
increase investment by about 0.6 rupiah. The first of these relationships, $\Delta Y/\Delta M$, is consistent with the theoretical premise that imports constitute income leakages. The second relationship which shows that $\Delta C^p/\Delta M$ is negative may perhaps be best explained jointly with the third relationship which shows that $\Delta I/\Delta M$ is positive.

It was mentioned earlier that the country's per capita GDP is very low. Consequently, consumption competes for funds against investment. Thus, the reduced model shows that $\Delta I/\Delta C^g$ is -0.1739, and in equation 6 on page 102, the regression coefficient associated with $C^p$ is shown to be -0.08675. The reduced form shows that a one-rupiah increase in imports would cause an investment increase of 0.592 rupiah. This positive effect on investment, which must be due to the fact that any large investment requires foreign-made capital equipment, would have to affect consumption negatively. Hence, $\Delta C^p/\Delta M$ is negative.

The relationships discussed in the foregoing paragraph will most likely prevail until Indonesia's per capita GDP is high enough to enable the country's voluntary savings to meet the going demand for capital. But they may also change if, under the given income per capita, foreign capital inflows could reach the amounts which are consistent with the current demand for investment.
The effects of inflation do not seem to be very significant, at least as far as the present model can show. Thus, one percent increase in the rate of inflation causes a fall of about $0.1P^*$ in GDP and $0.09P^*$ in private consumption, but causes an increase of about $0.001P^*$ in investment. In absolute terms these effects would not be very significant. Assuming that prices will be much more stable in the future than they were in the 1960's, it may be expected that these effects will be negligible in the future.

\footnote{In his lecture at the University of Indonesia in 1965, Professor Tinbergen stated that Indonesia's growing inflation had a killing effect on the economy. In spite of what is shown by the model, the present writer is convinced that Professor Tinbergen was right.}
CHAPTER FOUR  THE PROSPECT OF INDONESIA'S EXPORTS OF HER MAJOR AGRICULTURAL COMMERCIAL COMMODITIES

This chapter is concerned with the export prospects for Indonesia's agricultural products during the 1969-74 period. The primary concern is with coffee, copra, palm oil, rubber, and forest products, especially hardwood logs.

The trend in the world demand for these products will be reviewed first. The trend in Indonesia's exports and the prospects for increasing exports will be considered in the second part of this chapter.

World Exports in 1950-1968

The F.A.O. of the United Nations has made a distinction between two groups of agricultural commodities. Group I commodities are those for which the major problem to be overcome is to find an export outlet. Group II commodities are the ones for which the major problem facing the developing countries is how to increase their production (11, p. 60).

Coffee, vegetable oils and oilseed products to which copra and palm oil belong, and rubber are among the major agricultural commodities which fall under Group I category. Cereals, livestock, and forest products are the main commodities in Group II.

The basic differences between the problems of the two groups are reflected in the approach taken in this study.
In studying the export prospects of coffee, vegetable oils, rubber and forest products, it is assumed that there are no problems as far as the supply is concerned.

Forest products fall under group II. This implies that as far as the demand for these products are concerned, the problems involved are negligible. Since this study is not intended to examine any problem involving supply, it will be assumed that Indonesia's plan for producing and exporting forest products will be fully realized.

**Coffee, vegetable oils, and rubber**

Table 4.1 shows world exports of coffee, vegetable oils, and natural rubber for 1950-68.

<table>
<thead>
<tr>
<th>Types of Products</th>
<th>1950 million tons</th>
<th>1956</th>
<th>1962</th>
<th>1965</th>
<th>1968</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>2.07b</td>
<td>2.33</td>
<td>2.82</td>
<td>2.70</td>
<td>3.31</td>
</tr>
<tr>
<td>Vegetable oils</td>
<td>3.73</td>
<td>4.83</td>
<td>5.19</td>
<td>6.13</td>
<td>6.22</td>
</tr>
<tr>
<td>Natural rubber</td>
<td>2.25</td>
<td>1.94</td>
<td>2.28</td>
<td>2.31</td>
<td>2.50</td>
</tr>
</tbody>
</table>

*a* Source: (15).

*b* 1949 figures.

*c* This includes liquid edible oils and hard oils measured in terms of their oil equivalent.
In general, exports of all three commodities had been increasing although their rates of increase and behavior patterns vary. Coffee exports, for example, were declining between the years 1962-65. But by 1968 they were about 60 percent greater than the 1950 exports. This represents an average annual rate of increase of about 2.7 percent.

Vegetable oils exports have not shown any negative turns for the years shown in Table 4.1. The 1968 volume was 65.7 percent higher than in 1950. The export growth rate had thus been about 2.9 percent, a little higher than that of coffee exports.

Among the three commodities, natural rubber seems to have fared worst. Rubber exports were lower both in 1953 and in 1956 as compared to those of 1950. During the ten years prior to 1968, they did not increase to any significant extent. The 1968 exports were only 11.1 percent higher than those in 1950. This is equivalent to an average annual rate of increase of about 0.6 percent.

Forest products

World exports of forest products during the 1950 to 1968 period are shown in Table 4.2. Compared to the exports of the commodities discussed in the previous subsection, the export growth rate of the forest products had been much higher.
Table 4.2.\textsuperscript{a} Volumes of world exports of logs and sawn wood in 1950-68, selected years

<table>
<thead>
<tr>
<th>Types of Products</th>
<th>1950</th>
<th>1956</th>
<th>1962</th>
<th>1965</th>
<th>1968</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conif. logs</td>
<td>1.5</td>
<td>1.8</td>
<td>6.4</td>
<td>11.6</td>
<td>21.1</td>
</tr>
<tr>
<td>Non-con. logs</td>
<td>2.6</td>
<td>7.7</td>
<td>14.2</td>
<td>20.7</td>
<td>29.0</td>
</tr>
<tr>
<td>Sawn soft wood</td>
<td>21.2</td>
<td>28.1</td>
<td>38.2</td>
<td>44.0</td>
<td>47.5</td>
</tr>
<tr>
<td>Sawn hard wood</td>
<td>2.8</td>
<td>3.4</td>
<td>4.3</td>
<td>5.8</td>
<td>6.4</td>
</tr>
</tbody>
</table>

\textsuperscript{a}Source: (16).

In 1950 world exports of sawn soft wood, which is the most important forestry export, was 21.2 million cubic meters. Its export volume had reached 47.5 million cubic meters by 1968. This represents a 124 percent increase during the eighteen-year period or an average annual rate of increase of 4.6 percent.

The rate of increase of exports of the other three forest products has been larger than that of sawn soft wood. Coniferous log export volume in 1968 was 21.1 million cubic meters which was about 1,367 percent higher than in 1950. Its average annual rate of increase had been 15.8 percent. Non-coniferous log exports in 1968 were 29.0 million cubic meters or about 1,015.9 percent higher than in 1950. And exports of sawn hardwood were 6.4 million cubic meters in
1968 which was 128.6 percent higher than in 1950. On an annual basis exports of non-coniferous logs and sawn hardwood had been increasing at the average rate of 14.4 percent and 4.7 percent, respectively.

**Demand and price changes**

The volumes which the producer countries had been able to export in the past reflected partly the quantities the importer countries were willing to import at the current price levels. Hence, it is necessary to relate the export volumes discussed so far to the development of the commodity price levels during the corresponding years.

Regional and country differentials in commodity prices have been prevalent from year to year. From Table 4.3 one can observe the average per unit values of the commodities under discussion for the period 1950-68.

The data in Table 4.3 show that the average values of coffee and copra do not follow a clear trend. For palm oil, the data show a declining trend, and for rubber value, the data show a strong declining trend.

From the price data shown in Table 4.3, it is difficult to say whether the demand for coffee, copra, or palm oil has been increasing, decreasing, or constant. In the

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1The F.A.O. Production Yearbook shows regularly the prices of certain commodities which prevail in certain regions.
Table 4.3. World average unit values of coffee, copra, palm oil, rubber, and forest products in 1950-68, selected years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>959.2</td>
<td>1,051.0</td>
<td>655.6</td>
<td>811.1</td>
<td>725.3</td>
</tr>
<tr>
<td>Copra</td>
<td>219.1</td>
<td>142.5</td>
<td>142.2</td>
<td>188.4</td>
<td>189.0</td>
</tr>
<tr>
<td>Palm oil</td>
<td>309.6</td>
<td>219.4</td>
<td>194.4</td>
<td>237.7</td>
<td>146.1</td>
</tr>
<tr>
<td>Rubber</td>
<td>662.8</td>
<td>627.5</td>
<td>524.8</td>
<td>445.8</td>
<td>342.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Conif. logs</td>
<td>15.8</td>
<td>15.7</td>
<td>18.1</td>
<td>16.7</td>
<td>20.1</td>
</tr>
<tr>
<td>Brd1. log</td>
<td>20.0</td>
<td>19.6</td>
<td>22.6</td>
<td>23.3</td>
<td>24.1</td>
</tr>
<tr>
<td>Sawn soft wood</td>
<td>37.2</td>
<td>39.4</td>
<td>35.0</td>
<td>38.1</td>
<td>39.6</td>
</tr>
<tr>
<td>Sawn hard wood</td>
<td>59.6</td>
<td>62.2</td>
<td>59.2</td>
<td>58.8</td>
<td>59.7</td>
</tr>
</tbody>
</table>

*Source: (12, p. 199) and (13, p. 199).

In the case of rubber, however, the increase in exports has been very small in spite of the sharply declining trend of the price. This implies that the demand for natural rubber had been declining during the course of the years.

The demand for forest products, on the other hand, clearly has been increasing. Exports of coniferous and broadleafed logs have been increasing in spite of increased
prices, while exports of sawn wood have increased with constant prices.

The World Export Prospect for 1974

The basic export problems of coffee, vegetable oils, and rubber will be considered in the first part of this section. A brief account of the methods and assumptions employed for the projection will then be presented.

The basic problems

A little over half of world exports of Group I commodities to which coffee, vegetable oils and rubber belong, come from the developing countries. The bulk of these exports goes to the developed countries (11, p. 61). Thus the growth prospects of the exports of Group I commodities are determined primarily by the prospects for the expansion of the import demand in the developed countries.

The F.A.O. of the United Nations classifies Group I commodities into: non-competing commodities, directly competing commodities, and agricultural raw materials. Each of these sub-groups has certain features which are crucial to the commodities' export prospects.

Coffee, cocoa, bananas, and tea fall under the non-competing sub-group. The most important economic characteristics of these commodities is that per capita annual consumption reaches its saturation point at a very low level.
Thus, in the higher income countries the expansion of the demand for these commodities is determined primarily by population growth rather than income growth.

In the developed countries per capita income is high and population growth is low. Consequently, the growth rate of their import demand for these commodities is low. Vegetable oils, together with sugar, citrus, and tobacco fall under the competing group category. The developing countries do not monopolize the production of these commodities. Hence, the exports of these commodities face strong competition from domestic producers in the developed countries. Moreover, competition comes also from producers of animal fats and synthetics.

In short, the export demand prospects for vegetable oils will be determined largely by the rate at which producers of vegetable oils and animal fats in the developed countries are able to expand their output. The ability of producers in the developing countries to reduce their production and marketing costs will, of course, help to enhance their export prospects.

Agricultural raw materials, including natural rubber, face strong competition from synthetics. The increasing ability of the developed countries to produce synthetics which are almost perfect substitutes for natural rubber, and with better qualifications for certain purposes, has
made the export prospects of natural rubber dimmer than
the rest of the agricultural export commodities considered
in this chapter. The declining trend in the share of natur­
al rubber in the total use of rubber appears likely to con­
tinue although the rate may be somewhat slower.

Method and assumption.

The projected quantities of exports in 1974 are based
on the growth rate projections made by the United Nations
Conference on Trade and Development (51, p. 19). Since the
U.N.C.T.A.D projections for the agricultural commodities
draw heavily from the F.A.O. study, a brief discussion of
the F.A.O. projection method is presented.¹

The F.A.O. projection method is based on the theoret­
ical premise that, given the price-quantity relationship,
the market demand for a commodity is determined by income
and population. The first steps taken for the projection
were thus the formulation of population and of income
assumptions. Then, per capita demand was projected under
the assumption of constant prices. This was followed by
production projections. For each commodity, the projection
was concluded by confronting the world exportable supply
against the world import demand.

Population, GNP, and demand per capita

¹The organization of the discussion in this subsection
is adapted from Goreux (18, p. 17).
population growth rates used are based on projections made by the United Nations and found in Provisional Report on World Population Prospects as Assessed in 1963. The United Nations made high, medium, and low projections (11, p. 6). The F.A.O. adopted the medium variant for its 1965-75 projection. The population projections used are given in Table 4.4.

Table 4.4. The United Nations population projection adopted by the F.A.O. for its commodities' projections for 1975

<table>
<thead>
<tr>
<th>Countries</th>
<th>Developed</th>
<th>Centrally planned</th>
<th>Developing</th>
</tr>
</thead>
<tbody>
<tr>
<td>The 1965 population (million)</td>
<td>727</td>
<td>1,128</td>
<td>1,500</td>
</tr>
<tr>
<td>The 1965-75 growth rate (%)</td>
<td>1.1</td>
<td>1.8</td>
<td>2.6</td>
</tr>
</tbody>
</table>


For the world as a whole, the projected growth rate is 2.0 percent.

The assumption of the GDP growth is based on past trends, computed for 90 countries for the periods 1950-63 and 1958-63. The growth is expressed as compound rate of increase at constant prices.

Two growth rates had been adopted for the period
1965-75. The low rate, which was set below the past trends for the developed countries and equal to past trends for the developing countries; the high rate which was based on past trends for the developed countries and on the rates being sought under their development plans for the developing countries (10, p. 9). Thus the GDP growth rates assumed for 1965-75 are as found in the following table.

Table 4.5. World GDP growth rates assumed by the F.A.O. for its commodities' projection 1975

<table>
<thead>
<tr>
<th>Countries</th>
<th>Total GDP in 1965 (US$ billion)</th>
<th>Rates of growth (compound)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Developed</td>
<td>1,094.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Centrally planned</td>
<td>384.7</td>
<td>4.5</td>
</tr>
<tr>
<td>Developing</td>
<td>199.0</td>
<td>3.6</td>
</tr>
<tr>
<td>World</td>
<td>1,678.4</td>
<td>3.7</td>
</tr>
</tbody>
</table>

^Source: (10, p. 9).

^From now on the terms low and high will be used to refer to this assumption.

The projection of the growth rates of the GDP per capita is given in Table 4.6.

For the world the projection is 1.7 for the lower rate and 3.1 for the higher rate.
Table 4.6. The projected world per capita GDP growth rates

<table>
<thead>
<tr>
<th>Rates of growth:</th>
<th>Developed</th>
<th>Centrally planned</th>
<th>Developing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>2.3</td>
<td>2.7</td>
<td>1.0</td>
</tr>
<tr>
<td>High</td>
<td>3.6</td>
<td>4.2</td>
<td>2.9</td>
</tr>
</tbody>
</table>

*Source: (10, p. 10).

In line with the economic characteristics of each of the commodities discussed in a previous section, the mathematical functions used to project the world demand per capita for coffee is the log-inverse function \( \ln y = a - \frac{b}{x} \), and for vegetable oils, the semi-log function \( y = a + b \ln x \) (11, pp. xxiv, 34). Using 1960-62 as the base period, the F.A.O. has come out with the following projected per capita demand indices and income elasticity coefficients for the 1975 world projection:

1) The income elasticity coefficient is 0.18 for coffee and 0.55 for vegetable oils.

2) Total per capita consumption indices in 1975 are 103.1 and 106.9 for coffee and 111.3 and 122.0 for vegetable oils on the low assumption and high assumption, respectively (11, p. 108).
Production and import-export balance

projections As a starting point for the production projection trends over the 1950-63 period were taken, the projections took into consideration the growth rates which various national plans tried to achieve. High and low production projections were made for almost every commodity studied.

For each country under study a comparison was made between the projected demand and the projected production. For each country the comparison resulted in the potential net import requirement for certain commodities and the net export supply for other commodities. For the world as a whole the confrontation between the demand projection and the production projection resulted in the balance projection for the commodities under study. The balance projection is thus an approximation of the potential net import requirement and net exportable supply of the commodities under study.

Natural rubber The method used in the projection of the consumption of natural rubber was somewhat different from the one used for projecting coffee and vegetable oils. Demand was projected for both natural and synthetic rubber combined. Natural rubber's share in the total demand was then projected on the basis of trends that prevailed from 1954 to 1966 (10, p. 314).
The projection was made under the assumption that synthetic rubber would continue to increase its share of the total market. But it was also made under the assumption that improvement in grading, processing, and presentation of natural rubber in the world market would stimulate preference for natural rubber, and thus slow down the rate of displacement by synthetic rubber.

The projected rates of export growth

The U.N.C.T.A.D. export projections for the 1970-74 period presented in its Trade Prospects and Capital Needs of Developing Countries were based "as far as possible on F.A.O. demand and production estimates" (51, p. 17). However, the U.N.C.T.A.D. assumed that during the period under consideration, GDP in the developed market economies would grow at the rates of 3.7 and 4.2 on the low and high assumptions, respectively. The F.A.O. corresponding rates are 3.5 and 4.7. As it was mentioned at the beginning of this subsection, this study adopts U.N.C.T.A.D.'s growth rates.

The U.N.C.T.A.D. projections for the growth rates of the developing countries' exports in coffee, fats and oils, and natural rubber for the years 1960-75 are as follows: coffee: low 2.1, high, 2.3; fats and oils: low, 2.6 and high, 2.9; natural rubber: low 0.8 and high 1.9 (51, p. 20).

Based on these assumed rates of growth, this study will project the exports of coffee, copra, palm oil and natural
rubber in 1974 by employing the following form:

\[ X_{174} = X_{165}(1 + r_i)^9, \]

where \( X \) represents an export volume, \( i \) represents either coffee, vegetable oils or rubber, and \( r \) represents the projected rate of growth of the exports of one of the commodities.

It should be noticed from the simple exponential form employed that the period 1964-1966 is used as the base period instead of 1961-1963. Since the projected average growth rates are assumed to be constant during the period under study, the change does not violate any of the assumptions on which the F.A.O. or U.N.C.T.A.D. based its estimates.

The average export volumes of coffee, vegetable oils, and rubber of the developing countries in 1964-66, measured in million tons were: coffee, 2,830; vegetable oils, 3,750\(^1\) and natural rubber, 2,256 (51, p. 198).

Based on these figures, the export volumes of the developing countries in coffee, vegetable oils, and rubber in

\(^1\)This is obtained by subtracting the volumes exported by Western Europe and North America from the world exports in the commodity. Any amount exported by the Eastern European countries and other developed countries is included in this figure.
1974, measured in million tons, are estimated to be: coffee: low, 3.426, high, 3.744; vegetable oils, low, 4.730, high, 4.849; natural rubber, low, 2.421, high, 2.669.

The question is what will be Indonesia's share in each of the commodities in the same year. The next section is an effort to provide an answer to this question.

The Prospects of Indonesia's Major Agricultural Exports

The discussion in this section will start by presenting a description of the major agricultural exports in the past and then will examine the future export prospects.

The discussion of vegetable oils in this section differs slightly from that in the previous section. Indonesia's major exports in vegetable oils consist of copra and palm oil. Thus, it is more appropriate for the purpose to discuss copra and palm oil rather than vegetable oils as a whole.

It will be assumed throughout this work that the rates of growth of the exports of the two commodities are the same and equal to the growth rate of vegetable oil exports as projected by the U.N.C.T.A.D. This assumption is based on the premise that

1) the two commodities are close substitutes for each other, and

2) the two commodities are the most prominent
vegetable oils exports which originate in the developing countries.

Exports in 1950-68

There are at least two ways in which one may look at Indonesia's exports during the period 1950-68. One is by looking at their absolute volumes in each year and then determining the rates at which the exports of each of the commodities has been growing or declining. The other is by looking at the annual volume as a proportion of the total exports of the developing countries in each product and seeing how Indonesia's share of the commodity's exports has been changing over time. In this way it is possible to determine the rates at which the changes have been taking place. We will look at Indonesia's exports in both ways.

Coffee Indonesia is not one of the world's largest coffee exporters. It is seventh or eighth, depending on Mexico's position, after Brazil, Columbia, El Salvador, Ivory Coast, Angola, and Uganda. She is, however, the largest exporter in Asia. Leaving aside Singapore, which does not produce but only processes and exports coffee, India is the second largest. Her yearly exports vary from one-third to three-fourths those of Indonesia.

Indonesia's coffee exports during the 1950-68 period

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1 In this section the term "world" is often used to refer to the developing countries only.
are shown in Table 4.7.

Table 4.7. \( ^a \) Indonesia's exports of coffee compared to world\( ^b \) exports in 1950-68, selected years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>0.014</td>
<td>0.057</td>
<td>0.057</td>
<td>0.105</td>
<td>0.082</td>
</tr>
<tr>
<td>World</td>
<td>2.070</td>
<td>2.340</td>
<td>2.820</td>
<td>2.820</td>
<td>3.310</td>
</tr>
</tbody>
</table>

\( ^a \) Source: (15).

\( ^b \) See the footnote on preceding page.

In the course of the period coffee exports show a tendency to rise. In 1950 Indonesia's coffee exports were only 14,000 tons. By 1968 they were 82,000 tons. This represents a 485.7 percent increase during the eighteen-year period, or an average annual rate of increase of about 10.4 percent.

In 1968 Indonesia's coffee exports were about 2.48 percent of the total world exports.\(^1\) It is shown in Table 4.7 how Indonesia's share of world coffee exports developed during the period under discussion. While world exports in 1968 were only one-and-a-half times that of 1950, Indonesia's share in 1968 was more than five times its 1950 share. Compared with the 1950 share, the 1968 share showed

\(^1\) Note that Brazil's share in that year was 33.4 percent, Columbia's share was 11.9 percent, and that of the Ivory Coast was 6.5 percent (15).
an increase of about 294 percent, or an average annual rate of increase of about 7.4 percent.

**Copra** Indonesia is the second largest copra exporter in the world, the Philippines being the largest. In 1968 the Philippines exported about 640 thousand tons. That same year Indonesia exported only 250.07 thousand tons.¹

New Guinea and a number of other islands in the Pacific, Mozambique, Ceylon, Thailand, Malaysia, and Tanzania are the other countries or areas whose exports of copra reached ten thousand tons or more in 1968.

Indonesia's 1968 copra exports were about 250.1 thousand tons, which was 88.6 thousand tons lower than the 1950 exports. Indonesia's copra exports thus declined by 26.2 percent during the eighteen-year period. That is equivalent to an average annual rate of decline of 1.72 percent.

Indonesia's share in the world exports in 1968 was 20.5 percent. That was lower than her 1950 share which was 22.6 percent. Thus, during the eighteen-year period, Indonesia's share in world exports had declined at an average annual rate of 0.55 percent.

¹To avoid any possibility of underestimating the Philippines' capacity, it should be mentioned that this country exported 255.65 thousand tons of coconut oil in 1968. That was about seventeen times as much as Indonesia's exports of the commodity in the same year (15).
Table 4.8. Indonesia's exports of copra and the world exports in 1950-68, selected years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>0.3387</td>
<td>0.3082</td>
<td>0.1601</td>
<td>0.1266</td>
<td>0.2501</td>
</tr>
<tr>
<td>World</td>
<td>1.5000</td>
<td>1.7650</td>
<td>1.3443</td>
<td>1.3883</td>
<td>1.2206</td>
</tr>
</tbody>
</table>

*Source: See Table 4.7.

Palm oil In 1968 Indonesia's exports of palm oil were the third largest in the world. Malaysia was at the top and the Congo second. The next countries exporting 10,000 tons or more in that year were Singapore, Angola, the Netherlands, and Dahomey. Except for Singapore, whose exports in 1968 were 91.43 thousand tons, each of these countries exported less than 12 thousand tons.

Indonesia's 1968 exports of palm oil were 141.94 thousand tons. As one can observe from Table 4.9, the 1950

Table 4.9. Indonesia's exports of palm oil and the world exports in 1950-68, selected years

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>0.0971</td>
<td>0.1252</td>
<td>0.1001</td>
<td>0.1259</td>
<td>0.1419</td>
</tr>
<tr>
<td>World</td>
<td>0.5000</td>
<td>0.5772</td>
<td>0.5789</td>
<td>0.6181</td>
<td>0.7410</td>
</tr>
</tbody>
</table>

*Source: See Table 4.7.*
exports were 97.1 thousand tons. Palm oil exports increased by 46.2 percent during the eighteen-year period. This represents an average annual rate of increase of 2.1 percent. Indonesia's contribution to the world palm oil exports was 19.04 percent in 1950 and 19.10 percent in 1968.

**Rubber**

It has been mentioned that natural rubber is Indonesia's most important agricultural export commodity. The country is the second largest exporter of natural rubber in the world and exported 728 thousand tons in 1968. (Malaysia exported 1,172.04 thousand tons of rubber in 1968).

In Table 4.10, it is shown that there has been only a slight increase in Indonesia's rubber exports since 1950. In 1950 the exports were 728 thousand tons compared to 703 thousand tons in 1950. This means that in 1968 the exports were only 3.55 percent higher than they were in 1950, which represents an average annual growth rate of 0.3 percent during the eighteen-year period.

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>0.703</td>
<td>0.677</td>
<td>0.777</td>
<td>0.708</td>
<td>0.728</td>
</tr>
<tr>
<td>World</td>
<td>2.250</td>
<td>1.940</td>
<td>2.280</td>
<td>2.310</td>
<td>2.500</td>
</tr>
</tbody>
</table>

*Source: See Table 4.4.*
Indonesia's share in world exports of rubber declined from 31.28 percent in 1950 to 29.12 percent in 1968. In annual average terms the decline in the share was 0.12 percent.

**Forest products** Indonesia's exports of forest products consist mainly of non-coniferous logs and sawn wood. In Table 4.11, it is shown that there was practically no change in sawn wood exports during the 1950-68 period. Export volume has been close to ten thousand cubic meters annually.

Table 4.11. Indonesia's exports of non-coniferous logs and non-coniferous sawn wood in 1950-68, selected years

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Logs</td>
<td>0.127</td>
<td>0.195</td>
<td>0.078</td>
<td>0.140</td>
<td>1.879</td>
</tr>
<tr>
<td>Sawn wood</td>
<td>0.009</td>
<td>0.009</td>
<td>0.008</td>
<td>0.007</td>
<td>0.011</td>
</tr>
</tbody>
</table>

*Source: (16).*

There had been a spectacular rise in Indonesia's exports of non-coniferous logs since 1965, however. In 1965 the country's exports of non-coniferous logs were 0.14 million cubic meters, about 10.24 percent higher than it was in 1950. By 1968 exports rose to 1.879 million cubic meters, which was 1,379 percent above the 1950 level. As a result,
Indonesia's share in world exports of logs increased from 3.10 percent in 1950 to 4.97 percent in 1968. This means that during the eighteen-year period, Indonesia's share in world exports of logs has been increasing by about 2.7 percent annually.

**Indonesia's agricultural export prospects in 1974**

It was observed in the previous subsection that Indonesia's shares in world exports of coffee, copra, palm oil, rubber, and logs have been increasing on the average at the annual rates of 7.4 percent, -0.55 percent, 0.0 percent, -0.12 percent, and 2.7 percent, respectively.

For the projection of Indonesia's exports of coffee, copra, palm oil, and rubber it is assumed that:

1) Indonesia's shares in the years 1950-68 had been a reflection of her capacity to produce and to compete in the world market as well as that of her domestic demand for the commodities in question;

2) the rates at which the shares changed in the years 1950-68 will continue in the years ahead, at least until 1974.

As far as Indonesia's forest product exports, particularly that of logs, are concerned, it is assumed that they will be realized according to plan. This assumption is based on the fact that Indonesia's exports have been increasing tremendously since 1967, and on the fact that
world demand for the commodities have not been the limiting factor to exports. Furthermore, as it was stated before, this study is not concerned with the supply aspects of Indonesia's agricultural export problems.

**Indonesia's shares**  
Indonesia's shares in world exports of coffee, copra, palm oil, and rubber in 1965 were as follows: Coffee, 3.07 percent; copra, 11.08 percent; palm oil, 22.19 percent; rubber, 29.78 percent.

Based on the three assumptions mentioned earlier, it is possible now to project Indonesia's shares in the exports of the four commodities in 1974 by using the formula:

\[ S_{174} = S_{165} \left(1 + r_i\right)^9, \]

where \( S \) represents proportion or share, and \( r \) the rate of change of Indonesia's share in each of the commodities' world exports.

The results of the required computation show that Indonesia's shares in the four commodities' world exports in 1974 may be expected to be: Coffee, 5.84 percent; copra, 10.59 percent; palm oil, 22.19 percent; rubber, 29.47 percent.

In the discussion on the prospects of world exports, projections were made on the 1974 world exports of coffee, vegetable oils, and rubber. Based on the two assumptions on the growth rates of copra and palm oil mentioned at the
beginning of this section, it is possible now to suggest the following 1974 projections for the four commodities' world exports as shown in Table 4.12.

Table 4.12. Projections for world exports of coffee, copra, palm oil, and rubber in 1974

<table>
<thead>
<tr>
<th>Products</th>
<th>Assumptions (million tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Coffee</td>
<td>3.426</td>
</tr>
<tr>
<td>Copra</td>
<td>1.852</td>
</tr>
<tr>
<td>Palm oil</td>
<td>0.822</td>
</tr>
<tr>
<td>Rubber</td>
<td>2.421</td>
</tr>
</tbody>
</table>

The volumes of Indonesia's exports of the four commodities in 1974 can now be projected. Her forest product exports as projected by the planning authorities can be added to the projection list. Thus, in Table 4.13, one can observe the country's projected exports of coffee, copra, palm oil, natural rubber, and forest products.

Mentioned in thousand tons on the low and high assumptions, respectively, coffee exports will be 200.1 and 202.9. That of copra, 196.2 and 202.2; palm oil, 182.5 and 186.5; and that of rubber will be 713.5 and 786.5. The Indonesian planning authorities expect broadleafed log exports to be 5,016 thousand cubic meters and those of sawn hard wood to
be 55.0 thousand cubic meters.

Table 4.13. Indonesia's projected exports of coffee, copra, palm oil, natural rubber and forest products in 1974

<table>
<thead>
<tr>
<th>Type of goods</th>
<th>(thousand ton)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Coffee</td>
<td>200.1</td>
<td>202.9</td>
</tr>
<tr>
<td>Copra</td>
<td>196.2</td>
<td>202.2</td>
</tr>
<tr>
<td>Palm oil</td>
<td>182.5</td>
<td>186.8</td>
</tr>
<tr>
<td>Natural rubber</td>
<td>713.5</td>
<td>786.5</td>
</tr>
</tbody>
</table>

(Loggs\textsuperscript{a})

\textsuperscript{a}For this projection, see (42, p. 258).

**Foreign exchange earnings** In order to have some notion about future export earnings, some information on future prices is required. In projecting the export values in 1975, the FAO and the UNCTAD generally assumed that prices would remain constant at 1960 levels and 1961-63 levels, respectively. Only in the case of natural rubber it was mentioned in the FAO study that a decline in price to a level some 30-35 percent below the 1961-63 level might bring about a balance between world production and consumption at approximately 3.0 - 3.1 and 3.3 - 3.4 million tons.
In projecting Indonesia's export earnings in 1974, this study assumes that prices remain at the average levels prevailing during the last months of 1970 and the early months of 1971. These average price levels were, in terms of US$/ton: Coffee, 800.0; copra, 219.0; palm oil, 260.0; and rubber, 390.0 (50, pp. 164-68).

Concerning forest products it is assumed that the 1968 price level will prevail in 1974. On the average Indonesian logs were sold at a price of US$ 28.50/cubic meter\(^1\) in 1968.

Multiplication of the export volume of each of the commodities in Table 4.1 by the corresponding price gives export values as shown in Table 4.14.

If Indonesia could sell the five commodities at the going prices in the international market, the commodities would in total bring about US$ 673.3 million on the low export assumption and US$ 706.4 on the high export assumption.

Past experience has shown that in terms of their percentage of world prices, the unit values of Indonesia's commodities have on the average been about 45 percent for coffee, 76 percent for copra, 94 percent for palm oil, and 75 percent for rubber, and a little over 100 percent for logs. Taking this experience into consideration one should not preclude

---

\(^1\)This price is obtained by dividing the proceeds by the volume of log exports in 1968: F.A.O. of the United Nations Yearbook of forest products 1970, Rome, 1970, pp. 50 and 92.
Table 4.14. Indonesia's projected export values of coffee, copra, palm oil, rubber, and forest products in 1974

<table>
<thead>
<tr>
<th>Type of Products</th>
<th>(Million US$)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Coffee</td>
<td>160.080</td>
<td>162.320</td>
</tr>
<tr>
<td>Copra</td>
<td>42.968</td>
<td>44.282</td>
</tr>
<tr>
<td>Palm oil</td>
<td>27.450</td>
<td>48.568</td>
</tr>
<tr>
<td>Natural rubber</td>
<td>278.265</td>
<td>306.735</td>
</tr>
<tr>
<td>Logs and sawn wood</td>
<td>144 524</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>673.287</strong></td>
<td><strong>706.429</strong></td>
</tr>
</tbody>
</table>

the possibility that the contribution made by each of the commodities to the country's foreign exchange earnings in 1974 will be as shown in Table 4.15.

This would bring a combined contribution of around US$ 502.5 million of US$ 526.9 million on the low and the high assumptions, respectively. Assuming that the combined contribution of the five commodities to total agricultural exports will remain around 82 percent,¹ the total agricultural contribution to total foreign exchange earnings may be expected to be around US$ 612.8 million or US$ 642.6

¹This is the average contribution made jointly by the five commodities in the sixties. See footnote on p. 82.
Table 4.15. A projection of the contribution of each of the five commodities to Indonesia's foreign exchange earnings, based on the low and high assumptions.

<table>
<thead>
<tr>
<th>Type of Products</th>
<th>(million US$)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Coffee</td>
<td>72.036</td>
<td>73.044</td>
<td></td>
</tr>
<tr>
<td>Copra</td>
<td>32.656</td>
<td>33.654</td>
<td></td>
</tr>
<tr>
<td>Palm oil</td>
<td>44.603</td>
<td>45.654</td>
<td></td>
</tr>
<tr>
<td>Natural rubber</td>
<td>208.699</td>
<td>230.051</td>
<td></td>
</tr>
<tr>
<td>Logs and sawn wood</td>
<td>144.524</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Perhaps allowance should be made for the possibility that by 1974 Indonesian exporters and public officials concerned will have improved their efficiency sufficiently to be able to capture about half of the price differential pertaining to each of the commodities. Based on such an assumption, the country's earnings from agricultural exports in 1974 may be expected to be about:

\[
\text{US$} \left( 612.8 + \frac{673.3 - 612.8}{2} \right) \text{ million or US$ 643.1 million on the low assumption, and}
\]

\[
\text{US$} \left( 642.6 + \frac{706.4 - 642.6}{2} \right) \text{ million or US$ 675.2 million on the high assumption. Thus, the present study}
\]
projects that Indonesia's agricultural exports in 1974 may range from US$ 612.8 million to US$ 643.1 million on the low assumption, and from US$ 642.6 million to US$ 675.2 million on the high assumption. For simplicity it may be stated that Indonesia's 1974 agricultural exports may be expected to range between US$ 612.8 million and US$ 675.2 million.

We shall see soon that this projection is lower than the amounts expected by the planning authorities.
An effort is made in this chapter to study the relationships between Indonesia's agricultural exports and her present Five-Year-Development Plan. First, the relation between planning and the role of international trade will be discussed. Then, a somewhat detailed description of the plan will be presented. This will be followed by a quantitative description of the plan. The next section will be a discussion of the role of agricultural exports in obtaining the required amounts of foreign exchange required for the execution of the plan. Finally, based on the simple model suggested in Chapter Three, an endeavor will be made in the last section to project the gross domestic product, consumption, and the required investments in 1974 if Indonesia's political, social, and economic conditions which prevailed in the 1960's would remain unchanged during the planning period.

International Trade and Planning

Writers who are interested in the relationships between trade and economic development may be classified into two groups. The first group consists of those who consider trade to be conducive to economic development. Those who consider
trade to be hampering to economic development belong to the second (19, p. 17).

Writers who are for trade generally focus their attention on issues like comparative advantage, market expansion, specialization, and the effect of trade on technology. In essence their opponents claim that underdevelopment is in part a consequence of the international trading system.

Without committing ourselves to the view of either of the opposing groups, we may try to see whether their arguments can be used to examine the Indonesian case.

Trade and the problems involved

It is obvious that under present conditions Indonesia needs foreign markets. The need for trade springs from the fact that the opportunity costs of exporting her exportable resources are either zero or negative, and from the growing desire for economic development. Thus, Indonesia has to maintain trade in order to prevent the marginal values of her abundant resources to become negative and has to promote trade in order to be able to obtain the means required for economic development which are not available domestically.

This conclusion implies that as far as Indonesia is concerned, the opportunity to choose between the two alternatives, either for or against trade, does not exist. The prevailing conditions have made the choice for her.
As far as Indonesia is concerned, however, history has shown that the opponents of trade are in a better position than the pro-trade group to prove their points. It is clear that partly due to their ability to obtain raw materials from Indonesia and the opportunity to sell consumer goods in this country, industries have flourished in countries with which Indonesia has had trade relationships. On the other hand, trade did not help raise the productivity of Indonesia's largest economic sector. It did not help raise the technical or managerial skills of the majority of Indonesia's population. Neither did it help change Indonesia's technology.

In spite of all this, Indonesia has to maintain and even promote trade. Worst of all, at least for some time to come, it has to promote trade without changing its pattern. For the time being she has nothing to offer to the rest of the world but agricultural and mineral products. This means that the danger of the possibility for trade to have adverse effects on Indonesia's economy is as imminent as it has been.

In promoting trade for development, the Indonesians, especially their leaders, should always keep in mind that there is truth in what has been argued by the writers who are against trade. On the other hand, they should also know that under certain circumstances trade can stimulate
development. This latter point has been the crux of the arguments advanced by a group of writers, who, for the purpose of this work, may be considered as a third group.¹

This third group of writers argues that the effects of international trade on development depends on the structure and behavior of the domestic economy. In the line of reasoning followed by this group, the pro-trade writers seem to assume implicitly that the structure and behavior of the domestic economy of an underdeveloped country are such as to render trade conducive to economic development. Their opponents, on the other hand, seem to assume that the economic structure and behavior of a developing country is such that trade can only be a stoneblock to her economic development.

History has shown that Indonesia's economic structure and behavior has been a good example of the assumptions made by the trade opponents, at least until recently. And until recently there was no indication that her economic structure and behavior will be different in the future.

**Trade and planning**

In spite of the dangers involved, under present

¹Hicks and McNicoll brought this group forward in a framework of another classification of writers: those who focus their attention on the domestic economic structure and behavior of the underdeveloped countries and those who ignore them (19, p. 18).
conditions Indonesia has no choice but to promote trade. In the light of the third group's arguments, the crucial question facing the country is whether the structure and behavior of the country's domestic economy can change to the advantage of development.

The Indonesian leaders seem to have decided that the prevailing political, economic, and social forces in the country are such that in the absence of government deliberate efforts the domestic economic structure and behavior of the country will remain unchanged. Perhaps the Indonesian leaders are right. Thus, viewing the conditions from the economic point, it may be stated that the prevailing market forces in Indonesia are such that, left to themselves, they would not be able to induce the people to utilize the opportunities created by trade in a way that would stimulate economic development. In other words, full reliance on Indonesia's prevailing market forces would very likely keep her underdeveloped.

In the scope of this dissertation, and of the issues discussed in this section particularly, Indonesia's present five-year planning may be considered as an effort to render the trade effects stimulating to economic development. For the longer run it may be viewed as the first step to modify the domestic economic structure and behavior in such a way as to make trade conducive to further economic development.
Within the framework of the arguments of the first mentioned two groups of writers, the present plan may be viewed as an effort to capture all the advantages of trade pointed out by the pro-trade group in the face of all the dangers shown by those who are against trade. Thus, the large foreign exchange deficits, which, as will be observed soon, are planned to be incurred during the planning period, may be considered as a method to attain two objectives. The first objective is to increase the nation's capacity to produce in spite of the given economic structure and behavior. And the second is to force the nation to save parts of her future increase in income and foreign exchange revenues resulting from the increase in the nation's capacity to produce and to export, and to utilize them in ways that are consistent with development purposes.

The Plan Described

This section will start by bringing forward the targets that are established in the plan for each of the sectors. Then, a description of the planned allocation of the investment and foreign exchange which are expected to be available during the planning period will be presented.

Targets in the agricultural sector

The plan gives the highest priority to agriculture (42, p. 17). The decision to do so is based primarily on two considerations. One is that Indonesia's natural endowments
are such that agriculture should potentially be able to be developed speedily. The other is that agriculture is supposed to play a crucial role in the country's economic development.

The fact that the highest priority has been given to agriculture does not imply that the plan neglects the other sectors. It does imply, however, that in the other sectors the higher priorities will be reserved for the activities and projects which are intended to meet the growing needs for agricultural inputs and better agricultural marketing facilities.

**Food production** The plan sets targets for thirteen kinds of food products. In Table 5.1, it is shown by how much the production of the thirteen commodities are planned to be increased.

During the planning period rice production is to increase by 46.8 percent. On the basis of a linear rate of growth assumption, it may be stated that the plan set an average annual rate of increase of about 11.8 percent. This is a very high rate, indeed, especially compared with the one which prevailed during the 1953-67 period, which was only 1.5 percent (42, p. 164).

The rate of increase set for maize is not very high. By the end of the planning period production is expected to be 25.5 percent higher than at the beginning. And this
## Table 5.1.a  Targets in food production

<table>
<thead>
<tr>
<th>Types of Crops</th>
<th>(thousand ton)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1969-70</td>
<td>1973-74</td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>10,520.00</td>
<td>15,420.00</td>
<td></td>
</tr>
<tr>
<td>Sugar</td>
<td>677.00</td>
<td>907.00</td>
<td></td>
</tr>
<tr>
<td>Cocoa^</td>
<td>.82</td>
<td>1.63</td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>3,370.00</td>
<td>4,230.00</td>
<td></td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>8,300.00</td>
<td>11,200.00</td>
<td></td>
</tr>
<tr>
<td>Sweet potato and cassava</td>
<td>15,660.00</td>
<td>18,090.00</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>1.423.00</td>
<td>1,969.00</td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>67.32</td>
<td>167.97</td>
<td></td>
</tr>
<tr>
<td>Meat</td>
<td>321.70</td>
<td>539.50</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>37.52</td>
<td>120.96</td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td>85.50</td>
<td>93.00</td>
<td></td>
</tr>
<tr>
<td>Coffee^</td>
<td>158.00</td>
<td>163.00</td>
<td></td>
</tr>
<tr>
<td>Pepper</td>
<td>46.55</td>
<td>n.a.</td>
<td></td>
</tr>
</tbody>
</table>

^aSource: (42, pp. 165-265).

^bThe figures cover government estates production only.

^cAnother source mentioned that the production in 1968 was 163.0 thousand tons (54, p. 13).

^dNot available, but estimated to grow by ten percent annually.
represents an average annual rate of increase of about 6.3 percent, which is almost twice as high as the average annual rate of increase in the 1953-67 period. In this period the annual rate of increase was 3.3 percent.

No increase is expected in the growth rates of sweet potato and cassava. The expected average annual rate of increase is thus around 3.2 percent (42, p. 210).

There was a report that in the seven years prior to 1967, production of fowl and cattle had been decreasing (42, p. 263). As far as the plan is concerned, past development does not seem to be of any importance in determining future targets. Milk, meat, and egg production are planned to increase respectively, by 149.5 percent, 67.7 percent, and 222.3 percent by 1974.

Sugar production is supposed to be increased by 33.9 percent by 1974. The target figures, however, represent production targets for government estates only. The smallholder farmers produced 30.2 percent of the total sugar production in 1969. But the available planning data do not show how much they are expected to produce in any of the planning years.

The last targeted food commodities to be mentioned here are tea, coffee, and pepper. From Table 5.1, it can be observed that tea and coffee are supposed to increase by 1.76 percent and four percent annually, while pepper is expected
to increase by ten percent each year (42, p. 242).

Agricultural raw materials Included in the raw material list of targets are palm kernel, copra, groundnuts and soybeans, and rubber. The average annual rate of increase set for the planning period is about 16.4 percent for palm kernel and 11.8 percent for groundnuts and soybeans. The planned annual rate of increase of palm kernel production is not comparable to the one prevailing during the 1953-67 period, which was -0.5 percent (42, p. 228). Groundnuts and soybeans had an average annual rate of increase of 0.5 percent during that period.

The planned rates of increase of copra and rubber production are set for government plantations only. Government plantations produce about five percent of the total copra production. Hence, the target shown in Table 5.2 is not very meaningful as far as the total copra industry is concerned.

Government rubber plantations are expected to produce 104 thousand tons in 1970. Subsequently they are supposed to increase production by an average annual rate of about 6.72 percent. They had an average annual production of 120.5 thousand tons during the 1964-67 period.

Logs, palm oil, and tobacco In log production the plan sets a target of 2,900 thousand M³ for the year
Table 5.2. Targets in agricultural raw materials

<table>
<thead>
<tr>
<th>Types of products</th>
<th>(thousand tons)</th>
<th>1969-70</th>
<th>1973-74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm kernel</td>
<td></td>
<td>41.0</td>
<td>68.0</td>
</tr>
<tr>
<td>Copra</td>
<td></td>
<td>1.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Groundnuts and soybeans</td>
<td></td>
<td>95.0</td>
<td>140.0</td>
</tr>
<tr>
<td>Rubber</td>
<td></td>
<td>104.0</td>
<td>132.0</td>
</tr>
</tbody>
</table>

^aSource: (42, pp. 165-265)

^bFor government estates only.

1970^1. Subsequently production is expected to increase by an average rate of 43.1 percent annually. One may note that log production in 1969 was 6,206 thousand ton M^3, which was 60 percent higher than the previous year.

In Table 5.3, it can be observed that the target set for palm oil in 1970 is 172 thousand tons. An average annual rate of increase of 14.8 percent is set for the following years. Palm oil production in the 1963-67 period was on the average about 11.56 percent higher than the 1958-62

^1The fact that production in 1969 was 6,206 thousand ton M^3 must have surprised the planners.
average production. There was thus an average rate of in­crease of 2.11 percent.

Table 5.3. Targets in logs, palm oil and tobacco

<table>
<thead>
<tr>
<th>Types of Products</th>
<th>1969-70</th>
<th>1973-74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logs (000 M³)</td>
<td>2,900.0</td>
<td>7,900.0</td>
</tr>
<tr>
<td>Palm oil (000 tons)</td>
<td>172.0</td>
<td>275.0</td>
</tr>
<tr>
<td>Tobaccob (000 tons)</td>
<td>9.7</td>
<td>10.2</td>
</tr>
</tbody>
</table>

\[\text{\textsuperscript{a}}\text{Source: (42, pp. 165-265).}\]

\[\text{\textsuperscript{b}}\text{Government plantations only.}\]

The plan set a 1970 target of 9.7 thousand tons for government tobacco production. In the subsequent years, the plantations are expected to increase production by an average annual increase of about 1.2 percent.

**Targets in mining and manufacturing**

Mining and manufacturing are given priorities lower than agriculture. Nevertheless, the two sectors are expected to make substantial production increases.

**Mining** The plan set targets for petroleum, tin, beauxites, gold, and silver production. Petroleum production is expected to amount to 298 million barrels in 1970. The following years' production is expected to increase by 12.5 percent annually, and reach the amount of 440 million
It may be useful to mention that Indonesia's petroleum production in 1967 was 186 million barrels and represents about 1.5 percent of the world production.

Table 5.4. \(^a\) Targets in the mining sector

<table>
<thead>
<tr>
<th>Types of Products</th>
<th>1969-70</th>
<th>1973-74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum (million barrels) (^b)</td>
<td>293.0</td>
<td>440.0</td>
</tr>
<tr>
<td>Tin (thousand tons)</td>
<td>16.2</td>
<td>19.4</td>
</tr>
<tr>
<td>Beauxites (thousand tons)</td>
<td>1,000.0</td>
<td>1,200.0</td>
</tr>
<tr>
<td>Gold (thousand KG)</td>
<td>0.22</td>
<td>0.24</td>
</tr>
<tr>
<td>Silver (thousand KG)</td>
<td>9.72</td>
<td>10.20</td>
</tr>
</tbody>
</table>

\(^a\)Source: (42, pp. 340-49).

\(^b\)Note: 1 ton = 7,124 barrels.

Production of tin is set at 16.2 thousand tons for 1970 and 19.8 for 1974. This represents a planned average annual rate of increase of almost five percent. It should be noted that tin production was 16.9 thousand tons in 1968 (42, p. 221).

Beauxite production is set to be one million tons in 1970, which was about 19.5 percent more than the 1968 production. The planned average annual rate of increase for the following years is five percent.
From Table 5.4 one can observe that the increase rates in gold and silver production are about two percent and 1.26 percent, respectively.

Manufacturing One may feel that the planned or expected rates of production increase in agriculture and mining are very high. It will be observed soon that the planned production rates of increase in manufacturing are even higher than in the other two sectors.

Table 5.5.\(^a\) Targets in the manufacturing sector

<table>
<thead>
<tr>
<th>Types of Products</th>
<th>1969-70</th>
<th>1973-74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textiles (million meters)</td>
<td>450.0</td>
<td>900.0</td>
</tr>
<tr>
<td>Fertilizer (thousand tons)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>46.5</td>
<td>403.5</td>
</tr>
<tr>
<td>Phosphate</td>
<td>18.0 (1972)</td>
<td>168.0</td>
</tr>
<tr>
<td>Paper</td>
<td>16.0</td>
<td>166.2</td>
</tr>
<tr>
<td>Cement</td>
<td>600.0</td>
<td>1,650.0</td>
</tr>
</tbody>
</table>

\(^a\)Source: (42, pp. 165-265).

It can be observed from Table 5.5 that the highest rate of increase is planned in fertilizer production. Phosphate production is not expected to start until 1972, when it is expected to be 18 thousand tons. Two years later it is supposed to reach the amount of 168 thousand tons. This
assumes an average annual production increase of 400 percent.

The second highest increase rate is planned in paper production. The target set for 1970 was 16 thousand tons, which was 60 percent higher than the 1968 production level. By 1974 production is supposed to reach 166.2 thousand tons. This requires an average annual production increase rate of 235 percent.

Starting from a production level of 46.5 thousand tons in 1970, nitrogen production is supposed to reach 403 thousand tons in 1974. This requires an average annual rate of production increase of 191 percent.

Cement production is targeted at 600 thousand tons in 1970. A total increase of 175 percent is planned by 1974. Cement production is thus supposed to have an annual average rate of increase of 43.8 percent, which is lower than any of the expected increase rates discussed previously.

The expected or planned rate of increase of textile production is the lowest in the manufacturing sector. A target of 450 million meter was set for 1970. In 1974 textile production is not supposed to be more than 100 percent higher than the 1970 production. This does not require an average annual increase rate higher than 25 percent.

**Unquantifiable Targets**

What is referred to as "unquantifiable" targets here are those the values of which are difficult to estimate. In
the case of one target, the one involving electricity production target, the difficulty is due to the unavailability of data. In the other cases, however, the problems are conceptual in nature. For example, one may think of targets expressed in terms of length of roads and number of bridges to be upgraded, number of telephones to be installed, or the number of dams of a certain size to be built in certain areas. These are some examples of targets which are referred to as unquantifiable in this subsection.

It may be noted that this study needs estimates of the values of these unquantifiable targets. Later in this chapter the required estimates will be made.

**Investments**

The plan involves a total investment of 1,420 billion rupiah (42, p. 40). This amount is to be allocated as shown in Table 5.6.

The total investment expenditures are planned largely to be made by the government. Out of the total Rp 1,420 billions, only Rp 361 billions are expected to be made by private investors.

To finance the investments the government plans to rely on

1) government savings, which are defined as government revenues from domestic sources minus government expenditures;
2) foreign loan counter value payments which are paid to the government by the domestic companies to whom the foreign loans are transferred.

Table 5.6. Planned allocation of investments

<table>
<thead>
<tr>
<th>Sector or Major Project</th>
<th>Investment Plan (billion rupiah)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>159.0</td>
</tr>
<tr>
<td>Irrigation</td>
<td>236.0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>250.0</td>
</tr>
<tr>
<td>Mining</td>
<td>130.0</td>
</tr>
<tr>
<td>Electricity</td>
<td>100.0</td>
</tr>
<tr>
<td>Transport &amp; Communication</td>
<td>262.8</td>
</tr>
<tr>
<td>Tourism</td>
<td>2.2</td>
</tr>
<tr>
<td>Rural Development</td>
<td>50.0</td>
</tr>
<tr>
<td>Social Welfare</td>
<td>172.0</td>
</tr>
<tr>
<td>Security and Defence</td>
<td>28.0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>30.0</td>
</tr>
</tbody>
</table>

^Source: (42, pp. 44, 47).

^The more accurate figures are found at the end of each chapter in (42).

Government savings are expected to accumulate to Rp 226 billions during the planning period; and counter value payment receipts to Rp 883 billions. Funds for private
investments are expected to come from bank credits and from foreign investors.

The yearly allocation of the investments is planned to be as found in Table 5.7.

Table 5.7.\(^a\) Yearly allocation of investments (billion rupiah)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>123.0</td>
<td>153.0</td>
<td>223.0</td>
<td>264.0</td>
<td>296.0</td>
</tr>
<tr>
<td>Private</td>
<td>38.0</td>
<td>54.0</td>
<td>72.0</td>
<td>89.0</td>
<td>108.0</td>
</tr>
</tbody>
</table>

\(^a\)Source: (42, p. 40).

Except for the manufacturing sector, data on the sectoral breakdown of the yearly investments are not available at present.

Import and capital inflow

During the planning period import requirements are expected to rise every year. Their composition is expected to be changing. Imports of food, for example, are expected to decline from US$ 176 billion in 1970 to US$ 67 billion in 1974.

More imports of intermediate goods, except for fertilizer and newsprints, will be required as the execution of the plan proceeds. Imports of these goods were planned to be US$ 335 million in 1970 and to amount to US$ 680 million in 1974. Imports of fertilizer are expected to decline from

The need for foreign-made capital goods will also be increasing. Their imports were planned to be US$ 275 million worth in 1970, and about US$ 614 million worth in 1974.

Total imports were planned to increase from US$ 876 million in 1970 to US$ 1,438 million in 1974.

Export revenues are supposed to increase from US$ 672 million to US$ 924 million during the planning period. A comparison between export revenues to the import requirements would show that the latter exceed the former for each of the planning years, and that the excess grows with the years.

A closer look into the plan shows that the expected foreign exchange deficits for each year will be larger than the balance of trade deficits alone. The planners also expect deficits arising from net imports of invisibles and debt services. The total deficits to be incurred will rise from US$ 459 million in 1970 to US$ 1.081 billion in 1974.

Large amounts of capital inflows have to take place during the planning period. They are expected to be obtained from foreign loans and from private investments.

Administrative policies

Various administrative changes have been planned to
insure optimum efficiency in the plan's implementation. Some of the planned changes are procedural in nature, while others seem to be structural. Briefly stated, the planned administrative measures to be taken seem to be directed toward:

1) Giving greater authority to regional governments;
2) giving more autonomy to public utility managements;
3) leaving profit motivated enterprises to the private sector, and
4) simplifying bureaucratic procedures in the administration of exports, imports, interregional trade, as well as in matters concerning licenses. (42, pp. 123-49).

The Expected Role of Agriculture in Exports

From this section one will learn that the decline in agricultural contributions to exports mentioned in Chapter Three does not imply that its contribution to foreign earnings is also on the decline.

Exports of non-agricultural products

The available data on Indonesia's five-year plan contain information on the expected export proceeds and the expected export earnings. The difference between the two lies mainly in the exports of petroleum. As far as the data show it does not seem to be found in the exports of the
other mineral products.

Firms working in the petroleum industry have to spend significant amounts of foreign exchange on several purposes in order to be able to produce. Purchases of foreign-made equipment required for production as well as for marketing, payments for foreign investment income and foreign employees require substantial amounts of foreign exchange. Foreign exchange earnings from petroleum exports do not amount to more than the values of the exports minus the expenditures to be made for these purposes. During the planning period the total earnings from petroleum exports will not be more than US$ 571 millions which is only about 23.2 percent of the expected total value of the exports during the period (42, p. 88).

Assuming that the export volumes of tin, bauxites, and nickel are equal to the total produced, the joint contribution to exports made by the three commodities is expected to rise from US$ 43.0 million in 1970 to US$ 52.0 million in 1974.

There is nothing mentioned about manufactured commodities' exports in the official planning document REPELITA. Hence, it has to be assumed that the manufacturing industry's contribution to exports is negligible.
**Agricultural exports**

The expected export earnings for the years 1970-74 are, in terms of US dollars, 672 million in 1970, 775 million in 1971, 784 million in 1972, 827 million in 1973, and 924 million in 1974 (42, p. 96). From these data and from the discussion in the previous subsection, it may be concluded that in each of the corresponding years agricultural contribution to export earnings is expected to be, in terms of US dollars, 547.6 million, 576.4 million, 613.1 million, 666.9 million and 742.7 million, respectively. A comparison of these contributions to the expected total earnings would show that in each of the corresponding years during the planning period the agricultural contribution to foreign exchange earnings is expected to amount to 83.1 percent, 76.8 percent, 78.8 percent, 81.2 percent, and 80.7 percent.

The conclusion which has to be drawn from the discussion in this subsection is:

In spite of the decline in agriculture's shares to the total exports from 65.2 percent in 1960 to 38.5 percent in 1969, the Indonesian planning authorities expect that agriculture will contribute more than 75 percent to the expected total foreign exchange earned during the planning period.

**A Quantitative Description of the Plan**

In this subsection the variables in the plan will be
expressed in terms of their 1968 rupiah values. In terms of these values the description of the plan presented earlier in the present chapter can be summarized briefly.

**Targets**

The targets which are fixed by the planners are shown in Table 5.8. They are production targets in the agricultural sector, $Y^a$, manufacturing sector, $Y^m$, mining sector, $Y^e$, and in the rest of the economy, $Y^r$. The total value of these variables or the GDP, $Y$, is also shown in the table. From the table it can be observed that the planners aim at an average annual growth rate of 11.25 percent in agricultural production, 15.53 percent in mineral production, and 43.8 percent in manufactured goods production. Assuming that, as it has been in the 1960's, production in the rest of the economy will be $0.4136 (Y^a + Y^m + E)$, it may also be assumed that the planners aim at an average annual growth

<table>
<thead>
<tr>
<th>Year</th>
<th>$Y^a$</th>
<th>$Y^m$</th>
<th>$Y^e$</th>
<th>$Y^r$</th>
<th>$Y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1,138.75</td>
<td>53.07</td>
<td>325.67</td>
<td>797.84</td>
<td>2,285.53</td>
</tr>
<tr>
<td>1971</td>
<td>1,240.77</td>
<td>69.64</td>
<td>436.86</td>
<td>903.15</td>
<td>2,618.10</td>
</tr>
<tr>
<td>1972</td>
<td>1,349.76</td>
<td>83.49</td>
<td>414.02</td>
<td>983.94</td>
<td>2,795.67</td>
</tr>
<tr>
<td>1973</td>
<td>1,483.03</td>
<td>105.44</td>
<td>428.78</td>
<td>1,082.60</td>
<td>3,061.52</td>
</tr>
<tr>
<td>1974</td>
<td>1,651.58</td>
<td>144.50</td>
<td>527.94</td>
<td>1,222.45</td>
<td>3,502.40</td>
</tr>
</tbody>
</table>

*aSource: $Y^a$ and $Y^e$ are obtained by multiplying the physical targets by their 1968 prices. For $Y^m$, see (42, pp. 305-321). For $Y^r$ see Appendix 5, page 216.
rate of about 13.31 per cent in the nation's gross domestic product.

Targets as well as instruments

Investment, imports, and government savings have to be considered as targets because whether they will be materialized or not depends on other variables. At the same time the government can manipulate them to affect the development of the economy once she is in the possession of the required means. Hence, the three variables have to be considered both as targets and instruments. Their magnitude is shown in Table 5.9.

Table 5.9. a Total planned investments, imports and government savings

<table>
<thead>
<tr>
<th>Year</th>
<th>I</th>
<th>M</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>161.0</td>
<td>390.7</td>
<td>204.0</td>
</tr>
<tr>
<td>1971</td>
<td>207.0</td>
<td>464.2</td>
<td>243.0</td>
</tr>
<tr>
<td>1972</td>
<td>295.0</td>
<td>537.1</td>
<td>281.0</td>
</tr>
<tr>
<td>1973</td>
<td>353.0</td>
<td>593.5</td>
<td>319.0</td>
</tr>
<tr>
<td>1974</td>
<td>404.0</td>
<td>655.4</td>
<td>357.0</td>
</tr>
</tbody>
</table>

*Source: For I and C: (42, pp. 40, 41); M is converted into rupiah from (42, p. 93).*

It can be observed from Table 5.9 that to achieve the growth rates at which the planners aim, investment, imports
and government savings are required to grow at an average annual rate of 34.3 percent, 16.8 percent, and 35.6 percent, respectively.

The data

Capital inflows, $K^f$, agricultural and non-agricultural exports, $E^a$ and $E^o$, are the variables which have to be classified as data. As the following table shows they are expected to grow respectively by 33.87 percent, 8.42 percent, and 16.78 percent annually.

Table 5.10. Expected capital inflows, agricultural and non-agricultural exports in billion 1968 rupiah

<table>
<thead>
<tr>
<th>Year</th>
<th>$K^f$</th>
<th>$E^a$</th>
<th>$E^o$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>167.1</td>
<td>202.9</td>
<td>144.1</td>
</tr>
<tr>
<td>1971</td>
<td>254.5</td>
<td>212.6</td>
<td>191.9</td>
</tr>
<tr>
<td>1972</td>
<td>323.5</td>
<td>227.5</td>
<td>171.7</td>
</tr>
<tr>
<td>1973</td>
<td>365.9</td>
<td>242.9</td>
<td>188.8</td>
</tr>
<tr>
<td>1974</td>
<td>393.6</td>
<td>270.4</td>
<td>229.2</td>
</tr>
</tbody>
</table>

Source: (42, p. 87); converted into rupiah, $E^a$ and $E^o$ are adapted from (42, p. 96).

Targets compared to past performance

A comparison of the planned annual growth rates to the annual growth rates which prevailed in the 1960's
would show that the planners are not very modest in their aims. It is clear from Table 5.11 that, except for mineral production target, the planned growth rate of each of the variables is several times higher than the corresponding rate that prevailed in the 1960's.

There is one point worth noting in the comparison. The ratio between investment growth and gross domestic growth rates during the planning period is expected to be 34.30/12.92 or 2.66. This is higher than the one which prevailed in the 1960's, which was 3.43/3.37 or 2.50. This implies that in aiming at their targets the planners relied on a higher marginal capital-output ratio than the one which prevailed in the 1960's.

Based on this observation one could argue that whether the targets can be achieved or not will be determined by the amounts of investment which will be taking place in 1970-74.

The Relation of Agricultural Exports to Income, Consumption and Investment

A projection for Indonesia's agricultural exports in 1974 was made in Chapter Four. The country's agricultural

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1 Average growth rate during an n year period is defined as follows: The total value in the year $t_n$ minus the total value in the base year $t_0$, the residual is then divided by the total base year value; this total growth during the period $t_0$ to $t_n$ is divided by $n-1$. 
Table 5.11. a Planned growth rates in 1970-74 compared with those in the sixties

<table>
<thead>
<tr>
<th>Economic Category</th>
<th>1970-74 $(V_4 - V_0)/V_0$</th>
<th>1960-69 $(V_9 - V_0)/V_0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural production</td>
<td>11.25</td>
<td>2.21</td>
</tr>
<tr>
<td>Mineral production</td>
<td>12.38</td>
<td>10.26</td>
</tr>
<tr>
<td>Manufacturing production</td>
<td>43.80</td>
<td>4.76</td>
</tr>
<tr>
<td>Gross domestic product</td>
<td>12.92</td>
<td>3.37</td>
</tr>
<tr>
<td>Investments</td>
<td>34.30</td>
<td>8.43</td>
</tr>
<tr>
<td>Government consumption</td>
<td>18.80</td>
<td>-2.46</td>
</tr>
<tr>
<td>Agricultural exports</td>
<td>8.64</td>
<td>0.91</td>
</tr>
<tr>
<td>Non-agricultural exports</td>
<td>15.80</td>
<td>3.59</td>
</tr>
<tr>
<td>Imports</td>
<td>16.80</td>
<td>4.01</td>
</tr>
</tbody>
</table>

aSource: For 1960-69 (36, p. 201) and (6, pp. 408-9). For agricultural and non-agricultural exports see Table 3.3.

b$V_0$ stands for 1970 values; 4 for 1974 value.

c$V_0$ stands for 1960 values; 9 for 1969 value.

Exports in 1974 were estimated to be around US$ 612 millions on the lower export assumption and around US$ 675 millions on the higher export assumption. In terms of 1968 rupiah, they would amount to Rp 223.118 billions and 245.84 billions, respectively.
Indonesia's planning authorities expect that the 1974 agricultural exports will bring about US$ 743 million, which is equivalent to Rp 270.36 billions in terms of 1968 rupiah. This is US$ 100 millions more than the lower projection and US$ 69 millions more than the higher projection mentioned in the previous paragraph. In other words, this study's estimate on Indonesia's 1974 agricultural export earnings is about 9.3 and 13.4 percent lower than the earnings expected by the planners.

Under the assumption that Indonesia's domestic economic structure and behavior in 1974 will be the same as those in the 1960's, and that the expected capital inflows, government consumption, non-agricultural exports and imports will be realized, it may be possible to use the model introduced in Chapter Three to see the difference in income, consumption and investment under the three possible outcomes in agricultural exports.

A projection of income, consumption, and investments

To see the differences in income, consumption, and investment requirements under the three agricultural export possibilities in 1974, three estimates of the three variables will be presented. The three are based on the same model, but each is based on a different assumption with respect to agricultural exports.

The first estimate is based on the assumption that
agricultural exports will be as large as expected by the planners which for convenience will be called assumption A. The second estimate is based on assumption B, i.e., the assumption that agricultural exports in 1974 will be as projected under the low export projection. And the third estimate is based on the assumption that agricultural exports in 1974 will come out as projected under the high export assumption. This last estimate will be labeled estimate C.

It should not be necessary to mention that all the three estimates would not have any practical value if conditions in 1974 are significantly different from those in the 1960's.

The exogenous variables Agricultural exports in 1974 have been estimated to be around:

A. 270.357 billion rupiah;
B. 223.118 billion rupiah; or
C. 245.840 billion rupiah,

where A, B, and C refer to each of the three assumptions mentioned above. The planners' estimate on the 1973 agricultural exports is about US$ 666.9 million or 242.818 billion rupiah. Using the same assumptions and method in Chapter Three, this study's estimates are:

B. 201.414 billion rupiah, or
C. 229.615 billion rupiah.

From the previous section it is known that government
consumption, non-agricultural exports, and imports in 1974 are estimated to be:

\[ C = 357.000 \text{ billion rupiah}; \]
\[ E = 215.634 \text{ billion rupiah}; \]
\[ M = 655.380 \text{ billion rupiah}. \]

Based on these autonomous variables a projection for income, for private consumption, and for investment can be made.

*Three projections for 1974 income, consumption, and investment* Before applying the model, an important note should be made. There is no problem as far as one is merely concerned with investment, but there is one which pertains particularly to the projection for income and consumption.

The capital inflows which are expected during the planning period do not show in the model. But it should be borne in mind that these capital inflows will finance parts of the imports. They will thus eliminate parts of the total negative effects of imports on income and private consumption.

From the model one observes that the marginal reduction in income and private consumption due to imports are -1.375 and -0.9749, respectively. Consequently, to arrive at the projected 1974 GDP and private consumption, one has to make two steps. The first step is to solve for \( X_1 \) and \( X_2 \) by applying formula (8) in Chapter Three. The second is
multiplying $-1.375$ and $0.9749$ by the amount of the capital inflows which are expected in 1974 and adding the outcomes of each of the two multiplications to $X_1$ and $X_2$. Thus Indonesia's 1974 GDP and private consumption may be projected to be:

\[(8a) \quad \text{GDP}_{74} = c_1 + \sum_{i=1}^{5} b_{1i}k_{i} + \sum_{j=1}^{2} b_{j}X_j + 1.3875K_{74}^n\]

\[(8b) \quad CP_{74} = c_2 + \sum_{i=1}^{5} b_{12}k_{i} + \sum_{j=1}^{2} b_{j}X_j + 0.9749K_{74}^n\]

By applying formula (8) to obtain $X_1$, $X_2$, and $X_3$ on the basis of A, B, and C assumptions, one would find them to be as shown in Table 5.12. 1

Table 5.12. Projections for 1974 income, consumption, and investment on basis of three assumptions

<table>
<thead>
<tr>
<th>Assumption</th>
<th>$X_1$ (billion 1968 rupiah)</th>
<th>$X_2$ (billion 1968 rupiah)</th>
<th>$X_3$ (billion 1968 rupiah)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2,436.91</td>
<td>1,786.93</td>
<td>568.43</td>
</tr>
<tr>
<td>B</td>
<td>2,332.19</td>
<td>1,712.77</td>
<td>559.49</td>
</tr>
<tr>
<td>C</td>
<td>2,367.21</td>
<td>1,737.57</td>
<td>562.54</td>
</tr>
</tbody>
</table>

From the previous subsections one observes that capital inflows, $K^n$, in 1974 are estimated to be US$ 1.081 million, or, in 1968 rupiah terms, Rp 380.961 billion. Applying  

1 For the model, see page 105.
formulas (8a) and (8b) to project Indonesia's 1974 GDP, Y, and private consumption, C^p, and formula (7) to project that year's investment, one would estimate them to be as shown in Table 5.13.

Table 5.13. The 1974 estimated GDP, private consumption and investment under three different assumptions with respect to agricultural exports

<table>
<thead>
<tr>
<th>Assumption</th>
<th>X_1</th>
<th>X_2</th>
<th>X_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3,074.681</td>
<td>2,167.894</td>
<td>568.43</td>
</tr>
<tr>
<td>B</td>
<td>2,812.649</td>
<td>2,067.795</td>
<td>559.49</td>
</tr>
<tr>
<td>C</td>
<td>2,904.978</td>
<td>2,118.530</td>
<td>562.54</td>
</tr>
</tbody>
</table>

From the above table one observes that the income projections which are based on the assumption that Indonesia's agricultural exports will come to be consistent with this study, low and high estimates will be 9.3 percent and 5.8 percent lower than the projections which are based on the assumption that the planners agricultural export expectation will come out to be right. One also observes that the difference between the projected consumptions which are based on B and C assumptions on the one hand, and the one which is based on A assumption are 3.5 percent and 2.3 percent, respectively.

One can make a tentative conclusion, thus, that based
on the model introduced by the study, it may be expected that changes of 21.1 percent and 9.3 percent in agricultural exports may result in GDP changes of about 9.3 percent and 5.8 percent, and in private consumption, changes of about 4.8 percent and 2.3 percent, respectively.

**Indonesia's economic conditions in 1974**

It should be noticed that the GDP estimate based on the model on the assumption that agricultural exports and capital inflows in 1974 will be consistent with what the planners expect is about 12.2 percent lower than the estimate which was based on the various targets set forth in the plan. It should be noted, however, that this study's projection is based on the assumption that Indonesia's economic structural relationships in 1974 will be the same as they were in the 1960's.

Indonesia's economic structure and behavior in 1974 may not be much different from the 1960's structure and behavior. Nevertheless, it is likely that certain aspects of the economy in that year will be different from those that prevailed in the 1960's. Political conditions in the country have changed a great deal since 1966. One of the consequences of this change has been the relaxation of government control over the country's economic activities. This may have significant impacts on the people's motivations, expectations, and, hence, on their performances.
Another consequence of the political change is the fact that economic development has been given a very high place within the government preference system. One of the first things the present regime did was to combat inflation. As a result, the economic activities during the planning period will be performed in the absence of a galloping inflation.

The implementation of the development plan itself may cause considerable changes by 1974. The large investments made in many public works and utilities should have brought a great deal of change in the country's social overhead facilities. Hence, production and marketing activities in 1974 should proceed more efficiently than they did in the sixties.

It may also be expected, for example, that the introduction of new rice varieties will have raised land and labor productivities significantly by 1974. Perhaps, the government as well as private agencies which are responsible for the distribution of fertilizer and other farm inputs will have achieved such a degree of efficiency that by 1974 the farmers will be able to obtain these inputs at the right time, right place, and at prices low enough to make the marginal costs of utilizing the inputs lower than the marginal revenue or utility.

Furthermore, the administrative measures to be taken, mentioned earlier in this chapter, may have produced some
results by 1974. The absence of a galloping inflation may also have helped to reduce inefficiencies in the administration.

In the absence of inflation, savings may be expected to take place and to grow, and perhaps new opportunities for private investments will have opened up.

**Trade and the five-year planning**

The following table may facilitate the explanation of the role of the planning or its execution. The table is to provide an outline of the stages of economic development which Indonesia will have to go through in the process towards reaching the goal of economic development. Before getting into the main discussion, the meaning of each of the symbols has to be explained.

Table 5.14. a International trade and the stages of economic development

<table>
<thead>
<tr>
<th>Stage</th>
<th>Economic Structure</th>
<th>Trade Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Exports</td>
</tr>
<tr>
<td>I.</td>
<td>$C_w$, $R^a,e$</td>
<td>$R^a,e$</td>
</tr>
<tr>
<td>II.</td>
<td>$C_w$, $R^a,e$</td>
<td>$R^a,e$</td>
</tr>
<tr>
<td>III.</td>
<td>$C_{m,1}^w$, $R^a,e$, $I$</td>
<td>$R^a,e$, $C^m$, $I$</td>
</tr>
<tr>
<td>IV.</td>
<td>$C_m^m$, $R^a,e$, $K_s$, $I$</td>
<td>$C^m$, $I$, $K_s$</td>
</tr>
<tr>
<td>V.</td>
<td>$C_m^m$, $R^a,e$, $K_s$, $I$, $K_n$</td>
<td>$C^m$, $I$, $K_s$, $K_n$</td>
</tr>
</tbody>
</table>

aThis table is adapted from Ignacy Sachs (43, p. 42).
In this table, C. R. K, and I represent consumer goods, raw materials, capital and intermediate goods, respectively. Superscripts a, e, and m represent agricultural, extractive (mineral), and manufactured. And subscripts w, l, and s represent wage, luxury, and light, respectively.

Based on the table one may visualize economic development as a process which makes the economy move from stage I to stage V.

Stage I is the stagnation stage. In stage I, the country is a producer of agricultural wage consumer goods and agricultural and mineral raw materials, an exporter of these raw materials and an importer of manufactured wage and luxury commodities. When it has reached stage V, the country will be a producer of manufactured consumer, intermediate as well as capital goods, an exporter and an importer of these commodities. In this stage international trade between Indonesia and the other countries may perhaps be consistent with the comparative theory.

Another feature in stage V is that it will not be possible any more to make the distinction between luxury and wage or essential goods. The composition of the country's domestic consumption will no longer consist largely of food and clothing. The diet of the population will no longer consist largely of rice. Many of what at present are considered luxury goods will become "essential". And the diet
of the population will be more diversified.

Whether the country will ever reach stage V depends on many factors. At the moment the country may perhaps be considered to be between stage I and stage II, but closer to the former than to the latter. The domestic economic structure and behavior as well as the trade pattern are still such that at any time the economy can easily slip back to stage I. One of the goals of the present plan should be to prevent the possible slip from happening.

Viewed from the import sector, the execution of the plan is directed towards moving the import composition from $(C_{w,l}^m)$ to $(C_{w,l}^m, K_s, I)$. At the same time it has to steer the domestic economy in such a way that, in spite of the prevailing structure and behavior, it will be able to absorb the imported light capital equipments, $K_s$, and intermediate goods, $I$, in a way that will lead the economy to further development toward stage V.

The capital inflows which are expected to cover the balance of trade deficits will be of great help in the effort to move the import sector from stage I to stage II, without reducing the imports of manufactured wage and luxury goods significantly. Thus, assuming that the expected capital inflows will materialize, the required movement from stage I to stage II in the export sector should not be too difficult.
The most difficult part of the implementation of the plan will be encountered in the efforts of making the domestic economy able to absorb the imported capital investments, $K_s$, and intermediate goods, $I$, productively. In addition to the problems caused by the scarcity in managerial talents and skilled manpower, the government may still have to face two problems. One problem is that the improvement of the domestic infrastructure may not be able to develop in pace with the development in the production sector. The fact that the economy is partitioned regionally points to the seriousness of this problem. An increase in rice production in Sulawesi due to the increase in fertilizer imports, for example, would not sustain unless the additional rice could be shipped to another place and the rice growers concerned could obtain a reasonable price for their rice. In other words, unwanted product accumulation in certain areas may jeopardize any further effort to increase production.

The second problem is that the government may not succeed in curbing the high average and marginal propensity to consume imported manufactured consumer commodities. In such a case the production expansion that will be starting to take place due to the imports of $K_s$ and $I$ will not find markets. The losses suffered by the producers concerned would cause them to stop producing or at least to reduce production.
In brief, the most difficult task the government has to perform in order to completely leave stage I is that of preventing the stimulating effects of foreign trade from getting lost through income leakages abroad.

This chapter may be concluded by a statement that if the Indonesians succeed in their efforts to overcome the problems discussed in the foregoing paragraphs in 1974, one may be reasonably certain that it will not be very long before the economy reaches stages III and IV. Otherwise the country may remain hanging between stage I and stage II for a long time to come.
CHAPTER SIX SUMMARY AND CONCLUSION

This study has the purpose of examining (1) the effects of agricultural exports on Indonesia's economic development; (2) estimating whether Indonesia's agricultural exports during the period 1970-74 will develop according to plan; and (3) examining the possible effects on the implementation of Indonesia's present development plan if agricultural exports do not develop according to plan.

Summary and Conclusions

In spite of the fact that Indonesia also exports mineral commodities including petroleum and its products, Indonesia's agricultural exports occupy an important place as a source of foreign exchange of the country. Thus in spite of the forecast that petroleum will contribute more than 63 percent to Indonesia's exports in 1974 (42, pp. 88, 96), agricultural exports that year are expected to contribute more than 75 percent to the country's foreign exchange revenues.

Agricultural exports are important to Indonesia's economy not only because of their contribution to foreign exchange earnings, which are required for the import of essential consumer goods, half-finished goods, spare parts as well as capital equipment. They are also important because at the present stage of industrialization and degree of economic interregional integration, production of the presently
exportable commodities may have negative marginal value and, hence, affect real income negatively in the absence of export markets. Furthermore, except for the domestic trade sector, agricultural exports may be the only sector which has the potential to contribute significantly to capital for private investments.

A model showing Indonesia's economic structural relationships in the 1960's, which included the relationships between agricultural exports and the other sectors, was introduced in Chapter Three. The model shows, among other things, that every rupiah increase in agricultural exports would proportionally cause less increase in consumption than a rupiah increase in non-agricultural exports. On the other hand, it also shows that they cause net depreciation, while non-agricultural exports cause net investments.

Based on the export growth rates which were estimated by the UNCTAD of the United Nations for the developing countries' export products, and on the assumption that Indonesia's share in the world exports of each of the products would change at the same rate as they did in the 1950-69 period, this study has made a projection that Indonesia's agricultural exports in 1974 will not be lower than US$ 612.8 million and be higher than US$ 675.2 million. The low projection is about 21 percent and the high projection about 9.3 percent lower than the amount expected by the planning authorities.
Based on the model introduced in this study and assuming that government consumption, non-agricultural exports, capital inflows, and imports will develop according to what the planning authorities expect, this study projects that Indonesia's 1974 gross domestic product may be around Rp 2,812.65 billion, Rp 2,904.98 billion, or Rp 3,074.68 billion depending on whether agricultural exports in 1974 would be around US$ 612.8 million, US$ 675.1 million, or US$ 743 million.

Finally, this study suggests that even assuming that the expected capital inflows will materialize, Indonesia's economy may remain stagnant for quite a while in the future if by 1974 the country does not succeed in overcoming two problems. The first problem is the low inter-island or interregional mobility of consumption and half-finished commodities as well as of production factors. And the second is the high average and marginal propensity to consume imported goods on the part of the higher income groups in the various sectors. Under the assumption about capital inflows above, these two factors seem to constitute the most important domestic economic structure and behavior which hamper Indonesia's economic development.

Suggestions for Further Research and the Problems Involved

At the risk of mentioning the obvious, the present
writer feels that some suggestions for further research have to be made and the problems involved mentioned.

**Suggestions for further research**

The present Indonesian leaders have started to make serious efforts to raise the standard of living of the average Indonesian citizens. It is very likely that within a not-too-distant-future, five or ten years from now perhaps, they will need to know certain quantitative relationships which reflect the structure of Indonesia's economy in order to be able to launch economic plans and policies which are consistent with the prevailing conditions. In other words, they will need macroeconomic models of the types built by Thorbecke and Condos (47) and by Christian for Peru, (5b) and by Hicks and McNicoll for the Philippines (19).

The first next efforts may be directed towards the construction of a demand-oriented model that is much better than the one suggested in this study. To make such a model useful, one should at least disaggregate the investment variable into investments in the agricultural, mining, and manufacturing sectors, and where warranted, divide each into private and government investments. Furthermore, imports should be disaggregated into imports of consumers goods and
those of capital goods.

At the same time efforts should also be made to build
a supply-oriented model.

It is not necessary to mention that research which will
result into models which explain the non-quantitative aspects
of Indonesia's economic relationships are at least as neces-
sary as the one which will result into quantitative models.
Without the required understanding of the non-quantitative
aspects of Indonesia's economic structure, a quantitative
model may not be very useful to the Indonesian policy-makers
and planners. Remaining within the scope of this study, the
present writer would like to suggest that a study of the
supply conditions of Indonesia's agricultural export commod-
ities be made. Assuming that the agricultural export sector
is given the functions of increasing foreign exchange earn-
ings and contributing to efforts to raise the country's gross
domestic product and to capital formation, several examples
of the questions which could be answered by such a study are
the following:

A. 1) Why are the US$ prices of Indonesia's export
commodities generally lower than the inter-
national market prices? Is there any other
factor involved in addition to transportation
costs, e.g., product quality, or market rela-
tionships?
2) Defining efficiency as the difference between the average dollar value of each type of commodity converted into rupiah and the average rupiah variable costs of producing the commodity, is there any difference between the small-holder and the plantation agriculture in terms of their efficiency?

3) Are there significant differences between the prices of the export commodities that are received by the farmers and the rupiah prices paid to the exporters? If there are, what are the reasons?

4) In almost every document and paper, including the ones written by economists, it is always mentioned that the most important reason for the past decline in the exports of tree crops is the old age of the trees, and the most important solution suggested is replanting. To what extent is this true? And to what extent should attention be given to the problems which may be found in the domestic marketing organization?

B. 1) Assuming that as far as Indonesia is concerned export prices are given, is there any possibility of reducing production and domestic marketing
costs so as to make the value added accruing to the farmers and Indonesian exporters higher than they have been?

C. 1) How is the distribution of income within the sector?

2) In terms of their capacity to provide employment, is there any significant difference between the plantation and small-holder sector?

3) How large is the import component of the value of each commodity? And how large is the import component of the value of the commodities' package consumed in the sector?

4) What portions of the producers', processors', and exporters' incomes have been invested either inside or outside the sector?

Answers given to these questions would be useful not only for explaining the possible established quantitative models, but also for helping Indonesian planners and policy-makers to make decisions.

Labor division in research

There is no need to discuss research problems which are generally known, i.e., shortage of manpower, shortage of funds, and scarcity of data. However, it may be necessary to point to two other problems.

In relation to the suggestion that efforts be made to
establish quantitative models, first of all, one may ques-
tion whether meaningful coefficients which reflect the Indo-
nesian economic behavioral relationships could be estab-
lished. Two factors cause this question to arise. The first
is the fact that politically as well as economically, the
country was very unstable during the years 1942-66. The
second is the high probability that the degree to which
economic behaviors differ because of regional, sectoral, eth-
nical, urban-rural, as well as class differences, may be
significant. These two factors may make efforts to estab-
lish structural coefficients on the basis of time series or
cross-sectional data futile.

The second problem is the fact that Indonesia's economy
is regionally partitioned. This implies that a macroeconomic
model for the country as a whole would not be very useful if
not supplemented by regional macro models. This, plus the
fact that, as pointed out by Goldberger, "Experiments with
... models and data improvements are both required before
macro models can be built which will provide useful guide
lines for policy formulation ..." (47, p. 209), means that
the country needs considerably more research manpower than
it has and greater funds than those which can be made avail-
able in order to be in the possession of useful models within
five or ten years.

It would be useless for the present writer to pretend
as if he knew the solutions to these two problems. On the other hand, the problems would never be solved if no efforts are made to search for some solutions. The following suggestions may contribute to these efforts.

There seems to be no other way to overcome the first mentioned problem but to do the necessary experiments. Done properly, each subsequent experiment could be expected to give clues to better solutions. The models which are available five or ten years from now may not be the most useful ones. Nevertheless, assuming that the policy-makers and planners are aware of the weaknesses, and that the necessary non-quantitative types of studies suggested above will have some results by that time, there is a possibility that the macroeconomic models suggested five or ten years from now may be useful "as guidelines for policy formulation."

Mubyarto and Fletcher suggested that to optimize the results from the given human and financial resources, a coordination between economists who are doing research in agricultural economics in Indonesia is required (30b). The following suggestions are complementary to theirs.

Due to the large distance from one place to another and the inadequate transportation system available in the country, most research workers in the past had to spend large proportions of the available funds on transportation and of the available time on traveling. The country could
perhaps benefit most from the available funds and manpower if, in addition to the type of coordination suggested by Mubyarto and Fletcher, a certain type of regional division of labor is made between the existing universities. An example of such a labor division is that regional universities should be encouraged to do research in the regions in which they are located, while the other universities, which perhaps may be called "major" or "national" universities, should mainly be concerned with interregional relationships, and with interindustrial, intersectoral, and other relationships which may be relevant on the national level.

If considered acceptable and it could be carried out, the division of labor suggested here may have other advantages other than the optimized utilization of the available resources. To certain people, however, they may be too obvious or too unimportant to be mentioned here.

As a conclusion to this section it may be mentioned that "recognized" universities in Indonesia are mostly state universities. Hence, it should not be difficult for the Ministry of Educational and Cultural Affairs to initiate and maintain the coordination required to make the suggested labor division workable.


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ACKNOWLEDGMENTS

I wish to express my sincerest gratitude to my major professor, Dr. William C. Merrill. His stimulating instructions and inspiration have made the completion of this dissertation possible. His willingness to spend a great deal of his valuable time on this work made the preparation of this work the most valuable educational experience.

My sincerest gratitude is also due to the other committee members: Dr. George Beal, Dr. James W. Christian, Dr. Don F. Hadwiger, Dr. Wallace E. Ogg, Dr. Erik Thorbecke and Dr. John F. Timmons, who in spite of their busy time schedules have managed to give advice and make valuable suggestions; to Dr. Ali Wardhana, Dean of the Faculty of Economics, University of Indonesia, for giving me the opportunity to do graduate work at this university and to complete this dissertation; to Dr. Widjojo Nitisastro, Dr. Mohammad Sadli and Dr. J. E. Ismael for their guidance which led to the start of this dissertation.

The sincerest gratitude is also due to Mrs. W. Buttermore whose natural and sincere kindness made working in the reading room very pleasant; to Mrs. Charlotte Latta and Mrs. Shu Huang for their computational assistance; to Mrs. K. Suparno, S. H., Mr. Arlef Djanin, M.A., to Dr. B. Judono and to Dr. E. Swasono in Djakarta for their willingness to obtain data and send them to Ames; and to the Ford Foundation without
whose financial assistance this dissertation might not have appeared at all.

My deep appreciation is also due to two friends, Wallace and Emmanuel, for their helpfulness and for their words of encouragement which were badly needed, especially during the difficult months when efforts to write this dissertation were just begun.

Last, but not least, my deepest appreciation and gratitude are due to Titiek, Gajuh, and Wiwied, who are my closest friends in times of joy and sorrow.
APPENDIXES

Appendix 1
Table A 2-1. Indonesia's gross domestic expenditures at current market prices (billion rupiah)

<table>
<thead>
<tr>
<th>Items</th>
<th>1960</th>
<th>1961</th>
<th>1962</th>
<th>1963</th>
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*aSource: Nota Keuangan, 1971/1972 (36, p. 200).*
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Appendix 2
Table A 2 - 2.\textsuperscript{a} Indonesia's gross domestic expenditures at 1960 market prices (billion rupiah)

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<td>421.8</td>
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\textsuperscript{a}Source: Nota Keuangan, 1971/1972 (36, p. 201).

\textsuperscript{b}For the model, the export figures, and hence the GDP figures, are adjusted to export data obtained from (52).
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Table A 2-3. Indonesia's gross domestic product at 1960 prices by industrial origin (billion rupiah)

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<td>9.1</td>
<td>7.6</td>
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<tr>
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*Source: (26b, p. 23).*
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Appendix 4
Table A 3-1. The residuals of the predicted values of the GDP, private consumption, and investments in 1974 over their real values\textsuperscript{a, b}

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<td>R</td>
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\textsuperscript{a} The GDP, Y, is adjusted to data on exports obtained from (52).

\textsuperscript{b} \( P \) = the predicted values.
\( A \) = the actual values.
\( R \) = the residuals.
Appendix 5
Method of estimating $Y^r$

An effort was made to find out how $Y^r$ is related to $Y^a$, $Y^m$, $E$, and $M$. The regression equation is:

$$Y^r = -21.9 + 0.38Y^a + 2.34Y^m - 0.97M + 0.13E$$

$$R^2 = 0.91$$

The standard errors are: $(.34), (1.40), (.22), (.49)$ and $d = 2.7$

$Y^a = 154.44; Y^m = 227.55; Y^m = 37.54; M = 55.98, and E = 52.32$

Because of the high standard errors (figures between parenthesis), the only way to estimate $Y^r$ seems to be assuming that

$$Y^r = \frac{154.44}{227.55 + 37.54 + 55.98 + 52.32} (Y^a + Y^m + M + E)$$

or, $0.4126 (Y^a + Y^m + M + E)$. 