AN ANALYSIS OF INSTABILITY AND STABILIZATION OF EXPORT EARINGS IN ASEAN COUNTRIES

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A Thesis

by

APICHAI BOONTHERAWARA

Submitted in Partial Fulfillment of the

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TO

MY MOTHER AND FATHER,

MY SISTER AND BROTHERS,

AND

NAREE JONGWATTANATUM

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CHAPTER I

INTRODUCTION

A. The Statement of the Problem and Its Significances

Like other less developed countries, ASEAN countries[1] are facing with wide fluctuations in export earnings from primary commodities which are their major export.[2] To lesson the fluctuations in their export proceeds, some ASEAN countries have participated in various schemes such as the International Tin Agreement, the International Sugar Agreement. Recently, ASEAN sought to have the Stabex-type arrangement[3] with Japan to finance their export earnings shortfalls. The question concerned in this study is on the need for stabilizing export earnings.

A question can be asked whether export instability of the ASEAN countries inflicts adverse effects on their economies. Koomsup's findings indicated that in Thailand during 1951-1974, fluctuations in export earnings significantly and adversely affected most income

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[1]Association of South East Asian Nations (ASEAN) consists of five member countries namely: Indonesia, Malaysia, the Philippines, Singapore and Thailand.

[2]Wisarn Pupphavesa and Seiji Naya, "Principal Commodity Exports and Earnings Instability of ASEAN Countries," n.p., 1978. (Mimeographed.)

[3]The system to stabilize export earnings (STABEX) is one feature of the Lome Convention in early of 1975, which is the cooperation between the industrialized countries in the European Economic Community (EEC) and a large number of developing countries in Africa, Caribbean and Pacific Basin (ACP).

variables, investment, capital goods imports and government variables.[4] Pupphavesa's findings confirmed the employment and balance of payments effects of commodity export fluctuation in Malaysia.[5] The country-by-country analysis for ASEAN countries of Iwasaki and Kohama revealed several important relations between the fluctuations of both total merchandise exports and primary products and those of the macro-economic variables such as gross domestic products, gross capital formations and machinery imports.[6] These findings indicate the adverse effects of fluctuations in primary commodities exports of ASEAN on their economies and their attempts in searching for export stabilization schemes.

Various schemes in which ASEAN countries have participated are buffer stocks schemes which aim at mitigating the price fluctuations of commodities by directly interfering with the operation of market forces such as the International Tin Agreement and the Integrated Programme of UNCTAD. Since a buffer stock thoroughly relies on the accurate projection, the price control authority inevitably faces the risk of excessive stock accumulation and the costs associated with transaction and storage.

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[4]Praiphol Koomsup, "Export Instability and Export Diversification: A Case Study of Thailand," (unpublished Ph.D. dissertation, Yale University, 1978), pp. 42.

[5]Wisarn Pupphavesa, "Export Instability in ASEAN Countries," (unpublished Ph.D. dissertation, University of Hawaii, 1978).

[6]Yoshihiro Iwasaki and Hirohisa Kohama, "Japanese Stabex Arrangement with Southeast Asia," (paper presented to Pacific Basin Countries Sessions, W.E.A. 1978 Conference, Honolulu, June 1978), pp. 8-15.

Moreover, a buffer stock needs to be implemented by production restriction and export quota devices for its effective control of prices.[7] Regardless of all the difficulties and risk, the buffer stock for price stability may not always be desirable in the sense that price stabilization may destabilize export earnings stability or/and decrease the earnings level. Since many economists have analysed that the desirability of price stabilization depends on what are the causes of instability and the elasticity of demand and supply.

The Stabex-type arrangement which ASEAN countries are seeking is the compensatory financing scheme. The compensatory financing scheme aims to alleviate ex post the adverse effects of the export instability by compensating for the shortfalls in the export earnings. These seem to be a concensus among economists that the compensatory financing scheme is the most effective approach for the stabilization of primary commodity exports.[8] However, in seeking the scheme to cope with instability in export earnings of the ASEAN countries, more careful study on the causes of instability should be made.

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[7] C.P. Brown, Primary Commodity Control, (Kuala Lumper: Oxford University Press, 1975), pp. 157-159.

[8] Harry G. Johnson, "Commodities: Less Developed Countries' Demands and Developed Countries' Responses," The New International Economic Order: The North-South Debate, ed. by J.N. Bhagwati, (Cambridge: M.I.T. Press, 1977), pp. 240-251.

B. Literature Surveys

1. Survey of Instability Origin Identification

There are two approaches to study the causes of export instability. One is using the regression technique to examine the relationship between the export instability and the hypothesized explanatory variables such as commodity concentration ratio, geographical concentration ratio, primary commodity ratio etc. Massell, Naya, and Knudsen and Parnes employed this approach in their analysis.[9] The other is to identify the origin of instability whether instability originated from demand shifts or supply shifts which is used by Koomsup and Pupphavesa in their Ph.D. dissertations.[10] Koomsup, in his study of Thailand, found out that the cases of demand shifts account for more of the total value of all exports examined and food type exports are more subjected to supply-related fluctuations than the exports of mineral and raw materials which are affected by instability of demand in industrially developed countries. Moreover, the price elasticities of demand and supply for all exports examined are quite

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[9]B.F. Massell, "Export Instability and Economic Structure," The American Economic Review (September 1970), pp. 618-630.; Seiji Naya, "Fluctuations in Export Earnings and Economic Patterns of Asian Countries," Economic Development and Cultural Change, (July 1973), pp. 629-641.; and O. Knudsen and A. Parnes, Trade Instability and Economic Development, (Lexington, Mass.: D.C. Heath & Co., 1975), pp. 9-13.

[10]Praiphol Koomsup, op.cit., pp. 80-85.; Wisarn Pupphavesa, op.cit., Chapter IV.

high with a possible exception in the export supply elasticity of rubber.[11] In the case of the ASEAN countries, Pupphavesa's findings are mostly the same as those of Koomsup both in food-type exports and mineral and raw material exports of ASEAN countries, especially those of Thailand although he employed linear and exponential trends whereas Koomsup used five-year moving average trends.[12]

2. Survey of Price Stabilization

For export earnings stabilization, price stabilization via buffer stock would appear to be the earliest form of price stabilization. Most of the international arrangements for export earnings stabilization employ the buffer stock as the key instruments to stabilize prices of commodities. The attempts to stabilize earnings by means of price stabilization via buffer stock have been made mostly in form of individual commodity agreement such as the International Tin Agreement. Recently, the Integrated Programme proposed by UNCTAD is also in form of price stabilization via buffer stock. This integrated Programme of UNCTAD constitutes a core element called the "Common Fund" which is to finance a multi-commodity buffer stock. However, price stabilization via buffer stock does not always bring about the earnings stability. Since Brown, Brook, Grilli and Waelbroeck

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[11] Praiphol Koomsup, op.cit., pp. 109-111.

[12] Wisarn Pupphavesa, "Export Instability in ASEAN Countries," op.cit., pp. 4.35-4.53.

in their simple market model assuming linear demand and supply schedules and parallel shifts, have found out that firstly, the source of commodity price instability--together with the value of the price elasticities of demand and supply over the relevant range--is an important factor in determining whether price stabilization will also bring about revenue stabilization. Secondly, the source of commodity price instability is a crucial factor that determines whether price stabilization via buffer stock increases or decreases producers' income (or exporters' revenue).[13]

Many economists have also analysed the pure welfare effects of price stabilization via buffer stock from the standpoints of both producers and consumers. Assuming the stable cost function for the competitive firm faced with an uncertain demand, Oi demonstrated, by employing expected profit and expected utility maximization, that the producer of any good could make more profits when the price of that goods varied than he could if prices were stabilized at the arithmetic mean of the varying price.[14] Using simple graphical method, Waugh concluded that each individual consumer is better off with varying prices than he would be if prices were stabilized at or above their

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[13]C.P. Brown, op.cit., pp. 133-151.; E.M. Brook, E.R. Grilli and J. Waelbroeck, "Commodity Price Stabilization and Developing Countries: The Problem of Choice," International Bank for Reconstruction and Development, Bank Staff Working Paper No. 262, (July 1977), pp. 6-17.

[14]Walter Oi, "The Desirability of Price Instability Under Perfect Competition," Econometrica, Vol. 29,(January 1961), pp. 602-614.

simple, unweighted arithmetic mean.[15] Few years later, Massell integrated the Waugh and Oi results and considered the welfare effects of price stabilization in the model containing both producers and consumers. He used the expected value of producer surplus and consumer surplus as the measures of gain for producers and consumers respectively. He geometrically and algebraically concluded that the results of Oi and Waugh are held in the cases of shifts in demand with a stationary supply curve for the former and shifts in supply with a stationary demand curve for the latter, but the price stabilization via buffer stock provides a net gain to producers and consumers taken together.[16]

It can be seen that the origin of instability has crucial implications for price stabilization via buffer stock. Table 1.1 summarizes the income effects and welfare effects of price stabilization via buffer stock. If the shifts in demand are the causes of price instability, price stabilization via buffer stock will reduce earnings level but stabilize the export earnings and exporting countries as producers will lose whereas importing countries as consumers will gain in terms of welfare, regardless of the elasticities of both demand and supply of that commodity (see Table 1.1). On the other hand, in supply shifts market, the price stabilization via buffer stock will increase

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[15]Frederick V. Waugh, "Consumer Aspects of Price Instability," Econometrica, Vol. 34 (April 1966), pp. 504-508.

[16]B.F. Massell, "Price Stabilization and Welfare," The Quarterly Journal of Economics, Vol. 83 (May 1969), pp. 284-298.

TABLE 1.1

THE EFFECTS OF PRICE STABILIZATION VIA INTERNATIONAL BUFFER STOCK[1]

Source of Price Instability	Income Effect		Welfare Effect[2]		
	Export Earnings Level	Export Earnings Stability	Producer's Surplus	Consumer's Surplus	Net Effect
I. Demand Shifts Market					
- Elastic Demand	less	stabilized	less	more	more
- Inelastic Demand	less	stabilized	less	more	more
II. Supply Shifts Market					
- Elastic Demand	more	destabilized	more	less	more
- Inelastic Demand	more	stabilized[3]	more	less	more

[1]Prices are stabilized at their simple mean.
[2]The expected value of consumer and producer's surplus is the measure of welfare gain.
[3]Both demand and supply must be sufficiently inelastic. If supply is sufficiently elastic and/or demand is only slightly inelastic, export earnings may be destabilized.

Sources: Reproduced from C.P. Brown, Primary Commodity Control, (Kuala Lumper: Oxford University Press, 1975); E.M. Brook, E.R. Grilli and J. Waelbroeck, "Commodity Price Stabilization and Developing Countries: The Problem of Choice," International Bank for Reconstruction and Development, Bank Staff Working Paper No. 262 (July 1977); Walter Oi, "The Desirability of Price Instability Under Perfect Competition," Econometrica, Vol. 29 (January 1961); Frederick V. Waugh, "Consumer Aspects of Price Instability," Econometrica, Vol. 34 (April 1966); and B.F. Massell, "Price Stabilization and Welfare," The Quarterly Journal of Economics, Vol. 83 (May 1969).

the level of export earnings and welfare of producers (exporting countries) and consumers (importing countries) will lose in welfare, regardless of elasticities of demand and supply. But the price stabilization via buffer stock in this supply shifts market will destabilize the export earnings of exporting countries if the demand is elastic and vice versa (see Table 1.1). However, the net effect of welfare gain will always be positive.

3. Survey of the Compensatory Financing Scheme

The compensatory financing scheme is another alternative to cope with the export earnings instability. The concept of compensatory financing has emerged, and a variety of applications have been suggested. Compensatory transfers to mitigate the adverse effects of changes in terms of trade were first proposed in 1953, but did not gain support; some ten years later, similar proposals were submitted to the UN Conference on Trade and Development (UNCTAD). In late 1950's and at the beginning of the 1960's, schemes aimed at compensating for shortfalls in export receipts were devised by a UN Committee of Experts. In 1963, the International Monetary Fund (IMF) responded with the creation of its compensatory financing facility. The UNCTAD produced further suggestions, and in the discussions much emphasis was laid on compensatory financing as a convenient device for solving short-term and long-term problems.[17]

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[17]For more details of the development of compensatory financing scheme, see Gertrud Lovasy, "Survey and Appraisal of Proposed Schemes of Compensatory Financing," International Monetary Fund Staff Paper, Vol. 42. (July 1965), pp. 189-221.

Several economists performed simulations based on the historical data to examine various forms of the compensatory financing schemes in earnings stabilization. Jos de Vries[18] analysed the quantitative implications of three different compensatory financing schemes, due to the three different targets, namely the Lome-type scheme, the IMF-type scheme and the geometric scheme. Using country-by-country data for both the export earnings of 22 selected commodities and the total export earnings of all developing countries, he simulated the effects of those three compensatory financing schemes over the period 1961-1972 and then made various changes in the development of these earnings e.g., by changing the rate of inflation. He found out that various compensatory financing schemes react to inflation differently. Payments under a Lome-type scheme are very strongly eroded by inflation. Increasing the rate of inflation by 5 percent per annum reduce payments under a Lome-type scheme applied to total export earnings by around 70 percent. On the other hand, disbursements under an IMF-type scheme increase by about 20 percent in such a situation. The results under a geometric scheme are the only ones totally insensitive to the general level of inflation.[19]

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[18]Jos de Vries, "Compensatory Financing: A Quantitative Analysis," International Bank for Reconstruction and Development, Bank Staff Working Paper No. 228 (December 1975).

[19]Jos de Vries, loc.cit.

Morrison and Perez[20] performed simulations for two district compensatory financing schemes during 1960s and early 1970s. First, a scheme similar to STABEX, except that all OECD[21] countries are the donors instead of only the EEC and the potential beneficiaries are limited to 59 countries whose GNP per capita was less than 1000 US dollars in 1972. Commodity coverage included those commodities which account for at least 7.5 percent (2.5 percent for the poorest countries defined as those under 200 US dollars of GNP per capita) of a country's total export earnings. An export earnings shortfall represents a 7.5 percent drop (2.5 percent for the poorest countries) from the moving average of the commodity export earnings for the four previous years. Second, the existing IMF facility is liberalized in several ways. They found out that firstly the simulations of the compensatory financing schemes show that the costs would have been manageable and benefits fairly evenly distributed. Secondly, under inflationary conditions, the cost and benefit results are quite sensitive to changes in inflation rates. Thirdly, the costs and benefits did not differ greatly between the five-year and four-year moving average cases, nor between cases which stabilize different aggregations of exports. Finally, the simulations show that a scheme of the IMF-type might produce a benefit pattern more skewed to the higher income developing countries.

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[20]Thomas K. Morrison and Lorenzo Perez, "Analysis of Compensatory Financing Schemes for Export Earnings Fluctuations in Developing Countries," World Development, Vol. 4 (August 1976), pp. 687-694.

[21]Iwasaki and Kohama, op.cit., pp. 21-35.

For the ASEAN-Japanese version of the Stabex (often referred to as "ASEBEX"), Iwasaki and Kohama performed simulations for a historical period of 1964 to 1977 for 23 commodities which accounted for at least 1 percent of the total merchandise exports of every ASEAN country to all destinations and also represented at least 5 percent of the total merchandise exports of the applicant country to Japan in the pre-shortfall year. They used both the five-year arithmetic and geometric moving average as the estimates of the target earnings. The compensations are made according to various levels of trigger threshold such as 2.5, 5 and 7.5 percent of the targets. Moreover, the compensations are made, on nominal f.o.b. values of exports, either in full or 75 percent of shortfalls. Their simulated results[22] are firstly, the variants compensating the aggregate exports of a group of commodities (commodity basket variant) require only two-thirds of compensatory funds that are necessary for their commodity-by-commodity counterparts. Secondly, the choice of target level has crucial impacts on the costs and benefits of the scheme. Thirdly, the benefits from the variants are generally quite unevenly distributed among the commodities and countries. Commodity distribution of benefits accurately reflects the relative shares of the commodities in the export earnings. The country ranking according to the benefits, from high to low, is Malaysia, Indonesia, Philippines, Thailand and Singapore. Finally, the simulated variants indicate on the average 40-50 percent

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[22]Iwasaki and Kohama, op.cit., pp. 36-63.

improvement in the instability index values of the aggregate exports of all commodities.

4. Survey of Export Instability and Its Effects on ASEAN Economies

Pupphavesa and Naya[23] compared the time pattern of instability among ASEAN countries, they found out that the index in 1970-1975 rose as much as 3-5 times the levels for each ASEAN country, in the earlier periods and the ranking of export instability among members changes from period to period. But for 1970-1975, a sharp increase in the index is recorded for all countries. Their findings indicated that the problem of instability appears to be heightened and cuts across all countries and commodities. Furthermore, the index of ASEAN as a whole has been smaller than of the individual countries, suggesting some offsetting fluctuations among them. The question arises whether wide fluctuations in the ASEAN countries' exports have detrimental effects on their economies. There exist many studies on the effects of export fluctuations on LDC's but the findings so far have been contradictory. Coppock, MacBean, and Knudsen and Parnes found that export instability has not generally led to such detrimental effects on the economic variables, especially the growth of economies.[24] Maizels, on the other hand, concluded that the variations in export

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[23]Wisarn Pupphavesa and Seiji Naya, loc.cit.

[24]J.D. Coppock, International Economic Instability, (New York: McGraw-Hill, 1962); A.I. MacBean, Export Instability and Economic Development, (Cambridge: Harvard University Press 1966); and O. Knudsen and A. Parnes, loc.cit.

earnings of LDC's were indeed harmful to growth and income.[25] Many empirical studies on ASEAN countries, however, unanimously indicated the adverse effects of their export instability on their economies. In Thailand, during the period of 1951-1974, Koomsup's[26] regression analysis indicated the significant and positive relationship between fluctuations in total export earnings and those income variables such as agricultural income, GNP, and GNP per capita; but not with growth rates of income variables. Furthermore, there are the evidences of the significant relationship between export fluctuations and the level of investment (represented by gross fixed capital formations), capital goods imports and government revenue. Iwasaki and Kohama[27] regressed the residual ratio of macro-economic variables of ASEAN countries on that of exports for the period of 1960-1977. The residual ratio, of the fluctuations is defined as the ratio of the residual from semi-log trend line to the estimated value. They found several important results. Firstly, they found a close relation between the fluctuations of GDP at current prices and the fluctuation of exports for ASEAN countries, except in the case of Indonesia. But they obtained a positive and significant coefficient for Indonesia when the dependent variable is the fluctuations of GDP at constant prices. This may be

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[25]A. Maizels, "Review of Export Instability and Economic Development, by A.I. MacBean," American Economic Review, Vol. 58 (June 1968), pp. 575-580.

[26]Praiphol Koomsup, op.cit., pp. 12-42.

[27]Yoshihiro Iwasaki and Hirohisa Kohama, op.cit., pp. 4-15.

because the prices in Indonesia rose very rapidly through the 1960's. Secondly, by regressing the residual ratio of capital formation on the residual ratio of total exports and exports of primary commodities, the positive and significant coefficients are obtained for Malaysia and the Philippines. Those for Singapore and Thailand are also positive but not significant, whereas that of Indonesia is negative due to rapid inflation. Finally, in the case of Malaysia, there were the positive and significant relationship between the fluctuations of machinery imports and exports of primary commodities on the one hand and between capital formations and machinery imports on the other. The relation between the fluctuations of machinery imports and export of primary commodity of Thailand and the Philippines is ambiguous. Nevertheless, the positive and significant relation between fluctuations of capital formations and machinery imports are found in most cases.

On the whole, all findings related to ASEAN led to the conclusion that the export instability, both in total exports and primary commodity exports, has significant and detrimental effects on their economies. These findings make any scheme aimed at stabilizing the export earnings more significant.

C. The Objectives and Scope of the Study

The main objective of this study is to examine whether and how the compensatory financing schemes can be employed to stabilize the export earnings of ASEAN countries. However, we also take into

our consideration the possibility of price stabilization as an alternative for earnings stabilization. As we have presented in the literature survey section that price stabilization via buffer stock for earnings stabilization is subjected to many conditions such as sources of instability, the elasticities of demand and supply. Therefore, we try to identify the instability origin of export earnings of primary commodities of ASEAN countries and draw some implications for price stabilization via buffer stock. But the compensatory financing scheme is the main part of this study. What we would like to know are that, firstly, how much fund is needed for the compensatory financing scheme for ASEAN. Secondly, how the costs and benefits are distributed among countries and commodities. Thirdly, we would like to know the consequential effects of different trigger thresholds for compensation on the funds needed and the distribution of benefits. Finally, among the various trigger thresholds, we would like to know what is the better choice between compensating the shortfalls of commodities as a group and that for individual commodities, in efficiency ground.

The commodities included in this study are those commonly exported by ASEAN countries.[28] The instability origin of each commodity will be identified based on historical annual data during 1955-1976. The compensatory financing schemes will be simulated by using past data during the period of 1962-1975 in which the data of every commodity of each country are available.

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[28]The criteria for selecting commodities are discussed in Chapter II.

With those objectives in mind, Chapter II will give the background of commodity exports of the ASEAN countries and the commodity coverage of this study. Chapter III presents the methodology and the empirical results of instability origin identification of the selected primary commodities of the ASEAN countries. The methodology and empirical results of ASEAN compensatory financing schemes are presented in Chapter IV. The concluding chapter tries to draw some conclusions and policy implications from the findings in the preceding chapters.

CHAPTER II

BACKGROUND OF PRIMARY COMMODITY EXPORTS OF ASEAN AND THE COMMODITY COVERAGE

A. The Importance of Primary Commodities in ASEAN Exports

The ASEAN countries, like most less developed countries, have substantially high percentages of primary commodities in their exports.[1] Table 2.1 presents the export values and the percentage shares of the ASEAN countries' primary commodities in their total exports, averaging over 1970-1975. The average value of the total primary commodity exports of Malaysia and Singapore were 2,084 and 1,009 million US dollars which were the highest and the lowest, among members, respectively. But all members had the average value of the total primary commodity exports not less than 1,000 million US dollars.

In terms of average percentage shares of total primary commodity exports over 1970-1975, the ranks among member countries are different from those in terms of average export values. The countries' ranks, in terms of average percentage shares of total primary commodity exports in total export values, from high to low, are the Philippines, Thailand, Malaysia, Indonesia and Singapore, of which the percentage shares were 86.07, 79.73, 78.71, 35.24 and

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[1] Primary commodities are the commodities classified under Standard International Trade Classification (SITC) codes 0, 1, 2, 4 and 68, excluding mineral fuels (SITC 3).

TABLE 2.1

TOTAL EXPORT EARNINGS AND PRIMARY COMMODITY EXPORTS OF ASEAN COUNTRIES, AVERAGE OVER 1970-1975
(Thousand US dollars)

	Total Export Earnings	Total Primary Commodity Exports	Food & Live Animals SITC 0	Beverages and Tobacco SITC 1	Crude Material Excluding Fuels SITC 2	Animal, Vegetable Oil, Fat SITC 4	Non-ferrous Metals SITC 68
Indonesia	3,628,643	1,278,809 (35.24)	254,577 (7.02)	28,113 (0.78)	815,307 (22.47)	89,180 (2.46)	80,001 (2.21)
Malaysia	2,647,674	2,084,034 (78.71)	156,191 (5.90)	13,133 (0.50)	1,202,290 (45.41)	300,790 (11.36)	411,630 (15.55)
Philippines	1,670,196	1,437,581 (86.07)	523,473 (31.34)	24,369 (1.46)	690,937 (41.37)	176,163 (10.55)	22,641 (1.36)
Singapore	3,393,517	1,009,545 (29.75)	251,716 (7.42)	19,582 (0.58)	646,669 (19.06)	81,089 (2.39)	10,490 (0.31)
Thailand	1,501,630	1,197,263 (79.73)	770,160 (51.29)	17,202 (1.15)	308,982 (20.58)	-	100,919 (6.72)

Note: Primary commodities consist of the commodities classified under SITC 0, 1, 2, 4 and 68. The numbers in the parentheses represent the commodity's percentage share of total export earnings.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

29.75 percent respectively.[2] These because the former three countries are agricultural countries and hence high proportions of their exports are primary commodities. For the later two countries, the low figure of Indonesia is the result of excluding mineral fuels (SITC 3) which is its major export. Singapore has high development in manufactured products which are accounted for the greater proportion in its export composition and primary commodities are accounted for the less proportion.

The compositions of total primary commodity exports were shown in Table 2.1. Under one-digit Standard International Trade Classification, Indonesia, Malaysia, the Philippines and Singapore had crude materials excluding fuels (SITC 2) as their largest commodity group in their primary commodity compositions, and this group accounted for 22.47, 45.41, 41.37 and 19.06 percent respectively, over the 1970-1975 period. Only Thailand had food and live animals (SITC 0) as its major composition which accounted for 51.29 percent, but it did not export animal, vegetable oil and fat (SITC 4). Malaysia had non-ferrous metals (SITC 68) and Thailand had crude material excluding fuel (SITC 2) as their second major commodity exports whereas food and live animals (SITC 0) were the second major commodity group of the other three members. The third major compositions were animal, vegetable oil and fat (SITC 4) for all countries

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[2]If mineral fuel (SITC 3) was included in primary commodities, the percentage shares for the ASEAN countries in their total export earnings would be about 90 percent.

except Thailand, where non-ferrous metal (SITC 68) came third beverage and tobacco accounted for very small shares for all countries' primary commodity exports, less than 1 percent for Indonesia, Malaysia and Singapore, and 2 percent for Philippines and Thailand.

B. Commodity Coverage

Since we expect to draw some implications from the identification of instability origin for examining the stabilization scheme in the Chapter IV, the choice of commodity coverage will be based on this purpose. The proposed stabilization scheme to alleviate ASEAN export earnings fluctuations is some compensatory financing schemes. Therefore, the rules used in selecting the commodity coverage are as follows :

1. Since the ASEAN countries' export earnings are heavily dependent on primary commodities, those commodities selected must be primary commodities classified by Standard International Trade Classification Codes 0, 1, 2, 4 and 68. The reason of excluding mineral fuels (SITC 3) is that these commodities such that coal, petroleum and petroleum products, natural gas and electric energy have special and complex characteristics which are different from other primary commodities. The study of mineral fuels should be made individually and carefully because of their complexity and hence they are excluded from this study.

2. Each commodity must be an export of at least two member countries. This provides the possibility for compensation among member countries in the compensatory financing scheme proposed in Chapter IV.

3. There must be no trade among members in each commodity. This gives more significance to ASEAN compensatory financing scheme since the earnings of one country is at the expense of the others if that commodity is traded among members. It is impossible to find, however, that intra-ASEAN trade does not exist at all for such commodities. Therefore, we have to relax this rule to some extent. The more flexible rules are that firstly, from exporting countries' standpoint, the percentage share of each commodity exported to each member country should not exceed 10 percent of the total export earnings of that commodity. Secondly, from the importing countries' standpoint, the percentage share of each commodity imported from each member country should not exceed 10 percent of the total import value of that commodity. These figures, however, are arbitrarily determined.

According to the above rules, the commodities covered are presented in Table 2.2.[3] They are raw sugar (SITC 0611), spices (SITC 075), unmanufactured tobacco (SITC 121), oil seeds, oil nuts and oil kernels (SITC 221), natural rubber (SITC 2311), wood, lumber

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[3]The average values over 1974-1975 of imports and exports of ASEAN countries were used to select the commodities for commodity coverage.

TABLE 2.2

COMMODITY COVERAGE AND THE EXPORTING COUNTRIES OF ASEAN*

SITC	Commodity Export	Exporting Country				
		Indonesia	Malaysia	Philippines	Singapore	Thailand
0611	Raw Sugar			✓		✓
075	Spices	✓	✓		✓	✓
121	Tobacco, unmanufactured	✓		✓		✓
221	Oil Seeds, Oil Nuts and Oil Kernels	✓	✓	✓	✓	✓
2311	Natural Rubber	✓	✓		✓	✓
24	Wood, Lumber and Cork	✓	✓	✓		✓
2836	Ores and Concentrates of Tin	✓			✓	✓
4222	Palm Oil	✓	✓		✓	
4223	Coconut (Copra) Oil		✓	✓	✓	
6871	Tin and Tin Alloys, unwrought	✓	✓		✓	✓

*Commodities are selected based on the data, averaging over 1974-1975.

Source: Reproduced from all tables in appendix A.

and cork (SITC 24), ores and concentrates of tin (SITC 2836), palm oil (SITC 4222), coconut oil (SITC 4223) and tin alloys, unwrought (SITC 6871).[4] These selected commodities all follow the first and second rules, but some could not conform with the third rule, even the more flexible one. Indonesia, Malaysia and Thailand had some commodities, in the selected commodity coverage, that exceed 10 percent of their total export values of those corresponding commodities. Most of these commodities, however, were exported to Singapore, namely spices, oil seeds, oil nuts and oil kernels, natural rubber of Indonesia, Malaysia and Thailand; and palm oil, coconut oil of Malaysia (see Tables A.1, A.2, A.3, A.4, A.9 and A.10 in Appendix A). Nevertheless, these commodities are selected in the study because Singapore, unlike other members, behaves as an agent in importing commodities from other members and reexporting most of them to the world market, after some simple processing. In this way, earnings from those commodities of Indonesia, Malaysia and Thailand are not really at the expense of Singapore, provided they are not imported for final consumption of Singapore. Tin ores and concentrates of Indonesia were exported mostly to Malaysia and they are covered in this study for the same reason. For the import constraint, most selected commodities of Singapore which exceeded 10 percent of the corresponding commodities' import values were imported from Malaysia (see Tables A.7 and A.8 in Appendix A). The same situation appeared

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[4]We consider commodities under one SITC code as one commodity.

in Malaysia's imports, that is the commodities imported higher than 10 percent of their imports values were mostly imported from Indonesia, Singapore and Thailand (see Tables A.3 and A.4 in Appendix A). However, the absolute value of these imports were very small comparing with Malaysia's export of those commodities. For example, Malaysia imported 16 million US dollars in natural rubber from Thailand which was 82.07 percent of Malaysia's total import of natural rubber. Malaysia's total import of natural rubber was only 20 million US dollars comparing with 1,021 million US dollars of Malaysia's natural rubber export. For tin alloys (SITC 6871), Malaysia imported from Singapore the amount which accounted for 42.53 percent of the import value of 0.72 million US dollars. This value was very small compared with 566 million US dollars worth of Malaysia's export of tin alloys.

However, wood, lumber and cork (SITC 24) will not be covered in identifying instability origin, since there are problems of quantity unit.[5]

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[5]The quantity units are different between log, lumber and cork. Also the quantity unit is different over time (some are in cubic metres, some are metric tons). Moreover, the problem of data availability cannot be solved.

CHAPTER III

IDENTIFICATION OF INSTABILITY ORIGIN IN PRIMARY COMMODITY EXPORTS OF ASEAN

A. Conceptual Framework of Instability Origin Identification

An effective strategy cannot be initiated to eliminate the fluctuation problems, unless the causes of instability are discovered. One approach, among others, is to determine whether fluctuations in export earnings from each commodity have been brought about by supply or demand conditions. Since revenue is the product of price and quantity, revenue fluctuations can be mainly caused by fluctuations in price or in quantity or both. In identifying the instability origin of each commodity export earnings, Koomsup[1] presented four pure and simple cases of fluctuations caused by either shifts in a demand curve or shifts in a supply curve, added by graphical illustrations which also presented as follows.

Case I: Shifts in a Supply Curve with an Inelastic Demand Curve

Case I is graphically shown in Figures 2.1(a) and 2.1(b). With a given inelastic demand curve and some shifts in a supply curve over time, the trend-corrected movement if export earnings will

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[1]Praiphol Koomsup, op.cit., pp. 80-85.

follow fluctuations in price.[2] The shifts in a supply curve cause price fluctuations, on the average, to be greater than quantity variations because of the low elasticity of the demand curve. Hence the correlation between revenue and price fluctuations are expected to be higher than the one between revenue and quantity fluctuations. Moreover, with downward sloping demand curve, the shifts in supply lead price and quantity to move in opposite directions, and hence revenue fluctuations will be less than price fluctuations because of this offseting effect but could be greater or less than that in quantity.

Case II: Shifts in a Supply Curve with an Elastic Demand Curve

Case II is graphically shown in Figures 2.2(a) and 2.2(b). With elastic and downward sloping demand curve, the shifts in a supply curve cause quantity fluctuations, on the average, to be greater than that of price and also in opposite directions. Thus, revenue will fluctuate less than quantity but its fluctuation could be more or less than price. The positive correlation between revenue and quantity fluctuations is expected to be higher than that between revenue and price which is likely to be negative. Consequently, the trend-corrected revenue and quantity will move in the same direction most of the time.

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[2]To distinguish between the concept of "fluctuations" and that of "growth rate", Koomsup introduced time trend to measure export fluctuations more precisely.

FIGURE 3.1

CASE I: SUPPLY SHIFTS AND INELASTIC DEMAND

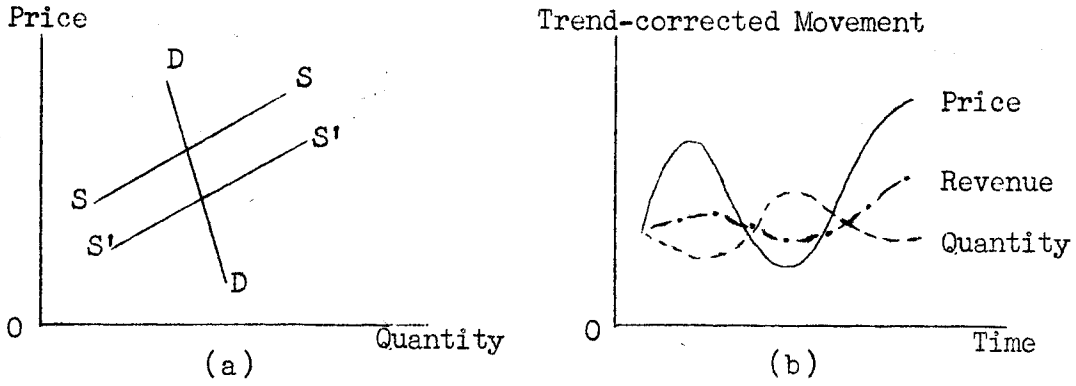


FIGURE 3.2

CASE II: SUPPLY SHIFTS AND ELASTIC DEMAND

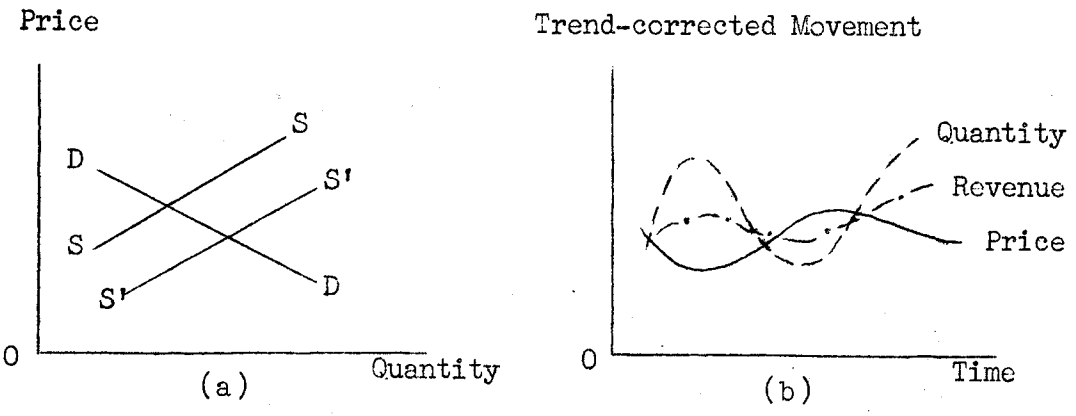


FIGURE 3.3

CASE III: DEMAND SHIFTS AND INELASTIC SUPPLY

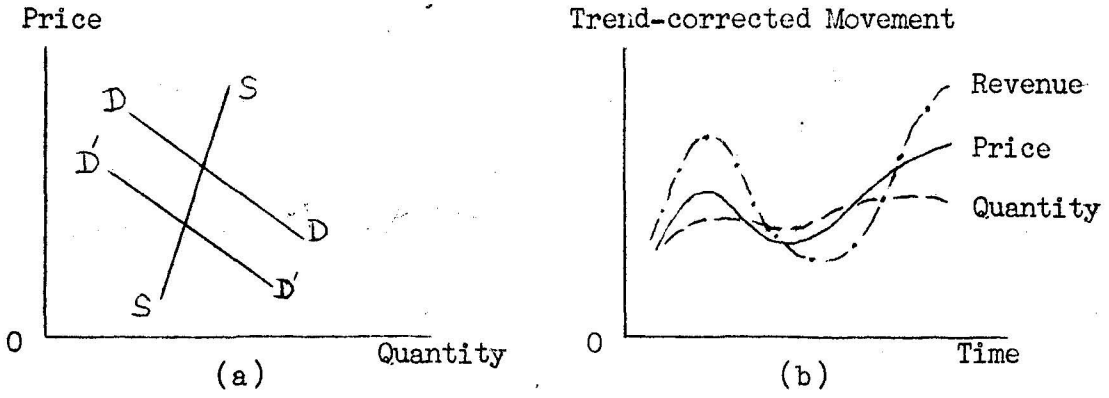
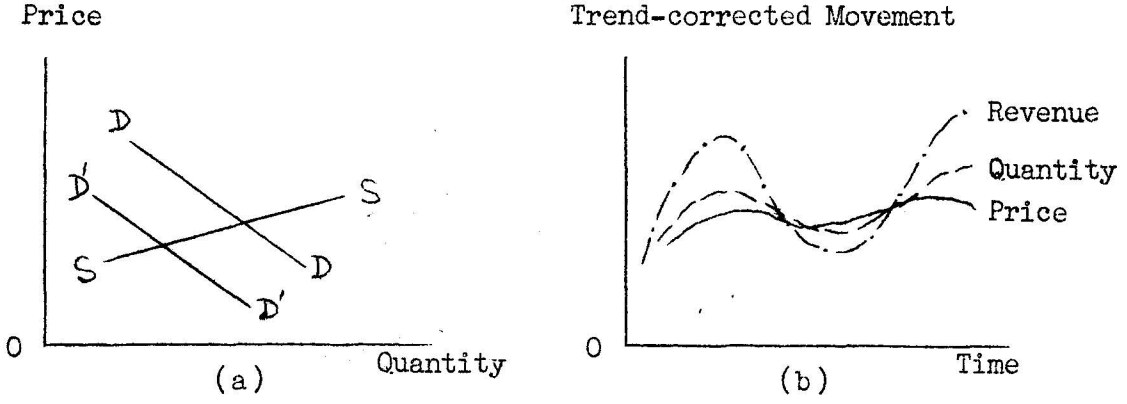


FIGURE 3.4

CASE IV: DEMAND SHIFTS AND ELASTIC SUPPLY



Source: Praiphol Koomsup, "Export Instability and Export Diversification: A Case Study of Thailand," (unpublished Ph.D. dissertation, Yale University, 1978), pp. 82-83.

Therefore, these two cases can be identified by two steps. First, revenue will have "non-explosive" movement, that is the degree of revenue instability is lower than either of those for price instability or quantity instability. Second, to determine the elasticity of demand, if price instability is higher than quantity instability and the correlation between revenue instability and price instability is significantly high or higher than that between revenue and quantity, then it is case I (inelastic demand). If everything is in reverse, then it is case II (elastic demand).

Case III: Shifts in a Demand Curve with an Inelastic Supply Curve

With the shifts in a demand curve intersecting the upward sloping supply curve, price and quantity will change in the same direction. Thus, revenue fluctuations will follow both price and quantity and will have a rather "explosive" movement in the sense that revenue instability will exceed the variation levels of both price and quantity. Further, since the constant supply curve is inelastic, quantity valuations will be less than those of price (see Figures 2.3(a) and 2.3(b)). Hence, fluctuations in revenue and price will be more highly correlated than the relationship between revenue and quantity fluctuation over time.

Case IV: Shifts in a Demand Curve with an Elastic Supply Curve

In this case revenue fluctuations still have an "explosive" movement relative to price and quantity for the same reason as in case III. But in case IV, unlike case III, quantity variations will be greater than those of price because of elastic supply curve (see Figures 2.4(a) and 2.4(b)). Thus, the correlation between revenue and quantity fluctuations is expected to be higher than that between revenue and prices fluctuations.

In summary, revenue will have an "explosive" movement relative to price and quantity for both cases of demand shifts (case III and case IV). Further more, if price fluctuations are higher than those of quantity, coupled with the high correlation between revenue and price fluctuations companied with that between revenue and quantity, then it is case III. If everything is in reverse, case IV explained the situation.

The above conceptual framework is based on the approximately linear normal demand and supply curves, with shifts in either demand curve or supply curve. In reality, fluctuations in export earnings of a commodity is the result of the combination of shifts in both demand and supply of that commodity. But what we would like to find out is whether demand and supply is the dominant factor causing fluctuations in each commodity's export earnings. In most cases, however, Koomsup pointed out that only one case is found to be more

crucial than the other.[3] This also was confirmed by the findings of Pupphavesa in which he examined further the simultaneous shifts, magnitudes and direction, in supply and demand curve.[4]

B. Methodology for Instability Origin Identification in ASEAN Commodity Exports

To examine the instability origin of primary commodities of ASEAN countries, we have at least three major problems which we have to solve at the first step. They are mainly the problems of choice. The first one concerns with the choice of commodity coverage already discussed in Chapter II. The next problem is what measure will be the best one in measuring the level of instability. Finally, for instability origin identification, what statistical procedure will be employed which will correspond to the conceptual framework presented in the preceding section.

1. Measure of Instability

To study instability in export earnings, the instability index has to be constructed as a measure of instability. Before going through the discussion of instability index, we have to distinguish between the concept of "fluctuations" and that of growth rate. Eventhough the two are expected to behave similarly over a

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[3]Praiphol Koomsup, op.cit., pp. 79.

[4]Wisarn Pupphavesa, "Export Instability in ASEAN Countries," op.cit., pp. 4.35-4.54.

period of time, it is not certain that the correlation between the two is perfectly positive. Usually, it tends to have growth in export earnings over time, therefore the fluctuations measured by the annual changes in level of export earnings could not reflex the "pure fluctuations." Thus, the better measure of fluctuations should be the deviations from some time trends. There are two techniques in estimating time trends.

a) The Mathematical Trend Line

This involves fitting a linear function of time either to the logarithm of export earnings or to export earnings. The fitting of either a logarithmic or linear function implies assumptions both on the deterministic and random components of export earnings. If the logarithmic function is fitted, the assumption is that the deterministic component is exponential and the random component is either independent of time or autocorrelated. If the linear function is used, the deterministic component is assumed to be proportional to time. But it is well known in econometrics that criteria such as goodness of fit cannot be used to distinguish between the functional forms of the deterministic component.[5] For instance, it is possible that the true functional form has a poor fit for the years of sample if the random component of export earnings is large or autocorrelated. But the incorrect functional form may have a good fit by chance.

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[5]Odin Knudsen and Andrew Parnes, op.cit., pp. 9.

Moreover, the exponential time trend yields the constant growth rate of export earnings through the years of sample.

b) The n-year Moving Average Technique

The method of moving averages in violating the trend is extremely flexible in the sense that the trend is not forced to conform to any particular mathematical function.[6] In other words, this procedure provides each year's expectations of export earnings which are specified by only earnings for n years and not by the entire period of observations and hence decreases the bias introduced by the misspecification of the exponential or linear function that was discussed in the previous section. The 5-year moving average trend probably best represents a medium-term trend for most macro-economic variables.[7] Therefore, moving averages tend to provide a realistic description of past trends in a time series and may be especially useful when studying deviations from trends of export earnings.

Our instability index will be constructed based on the five-year moving average trend line because of its advantages previously discussed. The absolute percentage deviations from five-year moving

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[6]William C. Merrill and Karl A. Fox, Introduction to Economic Statistics, (New York: John Wiley & Sons, Inc., 1970), pp. 471-74.

[7]Praiphol Koomsup, op.cit., pp. 18-19.

average trend line is used to compute our instability index. The formula is :

$$(1) \qquad I_i = \frac{1}{T-1} \sum_{t=1}^{T} \frac{|X_t - \hat{X}_t|}{\hat{X}_t} \times 100, \; t = 1, 2, \ldots\ldots, T$$

where, I_i = the instability index of commodity i,

X_t = the export earnings of commodity i at time t,

$\hat{X}_t$ = the export earnings of commodity i at time t on the five-year moving average trend line.

The advantage of using the absolute percentage deviations from trend is that it takes into account the relative size of fluctuations. The absolute size of fluctuations may overstate or understate the instability level of commodity export earnings. For instance, with the same level of absolute fluctuations, the instability index will be understated with the lower trend value and overstated with the higher trend value (the same fluctuations of 5 dollars from the trend values of 10 and that of 50 dollars).

This type of index will be employed for export earnings and price of commodity export as well as quantity export for all commodities in our commodity coverage in identifying instability origin of commodity exports.

2. Statistical Methodology in Identifying Instability Origin

We adopted Koomsup's methodology which has been discussed in the previous section of conceptual framework. Therefore, to

identify the dominant source of fluctuations we first have to see whether the degree of revenue instability (RI) is lower than either of those for price instability (PI) and quantity instability (QI). If this is so, then RI is said to be non-explosive and fluctuations in earnings come mainly from shifts in supply. Then we can determine whether it is case I(inelastic demand) or case II (elastic demand) by examining if :

(i) QI is less than PI; and

(ii) the correlation between RI and PI is significantly high or higher than that between RI and QI.

If both (i) and (ii) are true, then instability is of the type in case I. If not, then case II explains the situation.

However, if RI is greater than both PI and QI, RI is explosive and is likely to be brought about by demand shifts. Again, to decide if it is case III (inelastic supply) or case IV (elastic supply), we must see if :

(i) QI is less than PI; and

(ii) the correlation between RI and PI is significantly high or higher than that between RI and QI.

If the answer to (i) and (ii) are affirmative, it is case III. If not, the situation is likely to be categorized into case IV.

Statistically, we will regress RI on PI and RI on QI by employing the simple regression technique. The coefficient of determination (R^2) will be the indicator of correlation between RI and PI and those between RI and QI.

3. Data Collection

The data used are annual data of export earnings of each selected commodity in terms of US dollars. The unit values are the proxy for export prices of commodities. Each commodity's unit value is obtained by dividing its export earnings by its quantity exports. The annual data of export earnings and quantities are secondary data mainly collected from UN Yearbook of International Trade Statistics, over the period of 1955-1976. The length of period is different from commodity to commodity, but the shortest period is from 1962 to 1975. If the data for some particular years are not available, we inevitably had to collect them from other sources, namely UN Commodity Trade Statistics, FAO Trade Yearbook.

C. Empirical Results

The empirical results of instability origin of selected primary commodities will be presented in two categories. First, the instability origin will be identified on a country-by-country basis. Second, the cross country results will be examined for the commodity-by-commodity basis.

1. Country-by-Country Study

a) Indonesia

The instability indices of prices, quantities, and earnings of individual selected export commodities in Indonesia are shown in Table 3.1. Tables 3.2 and 3.3 contain the results of linear least-square regression between RI and QI, and between RI and PI respectively. The results of source identification of earnings instability for individual selected commodities in Indonesia are shown in Table 3.4. The first observation on the overall results in Table 3.1 is that all selected commodities of Indonesia have explosive movements in earnings for both foodstuffs and raw materials with the exception of palm oil. These results indicate that the shifts in demand are the sources of earnings instability for all commodities, except palm oil which is caused by the shifts in supply (see Table 3.4). However, our findings mostly conform with Pupphavesa's findings, except in the case of tobacco.[8] The second observation is that among six commodities which are in the cases of demand shifts, four commodities are classified in case III (i.e. demand shifts and inelastic supply), namely spices, tobacco, oil seeds and natural rubber. Tin alloys are classified in case IV (i.e. demand shifts and elastic supply), but it is inconclusive for tin concentrates (see Table 3.4). Palm oil

[8] Wisarn Pupphavesa, "Export Instability in ASEAN Countries," op.cit., pp. 4.34-4.35.

TABLE 3.1

AVERAGE ANNUAL FIGURES FOR THE ABSOLUTE VALUES OF PERCENTAGE DEVIATION FROM FIVE-YEAR MOVING AVERAGES OF PRICE, QUANTITY AND EARNINGS OF INDONESIA'S SELECTED EXPORT COMMODITIES, 1955-1976

SITC	Export Commodity	Price Fluctuations (%)	Quantity Fluctuations (%)	Earnings Fluctuations (%)	Period Coverage
075[a]	Spices	24.85	22.02	31.13	1955-1976
121	Tobacco, unmanufactured	30.01	18.46	32.25	1955-1976
221[b]	Oil Seeds, Oil Nuts and Oil Kernels	28.25	22.74	28.80	1955-1976
2311	Natural Rubber	25.72	5.98	27.24	1955-1976
2836	Ores and Concentrates of Tin	34.03	22.51	47.89	1955-1976
4222	Palm Oil	33.18	28.37	31.52	1955-1976
6871	Tin and Tin Alloys, unwrought	21.47	58.44	64.06	1955-1976

[a]The data of spices for 1964-1965 are estimated by assuming, empirically, fixed proportion between SITC 075 and SITC 075.1.
[b]The data of SITC 221 for 1964-1965 are estimated by assuming, empirically, the fixed proportion between SITC 221 and the average of SITC 221.2 and 221.3.

Note : All fluctuations are measured in terms of percentage deviations from five-year moving averages.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.2

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND QUANTITIES FLUCTUATIONS IN INDONESIA'S SELECTED EXPORT COMMODITIES, 1955-1976

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\ (QI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(QI)_i$ is fluctuations in quantity of export i,
α , β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[h]
075	Spices	-4.55 (-0.54)	0.68[c] (2.17)	0.23	4.70[e]	1.44[f]
121	Tobacco, unmanufactured	-5.01 (-0.52)	0.60[d] (1.47)	0.12	2.16	1.59[f]
221	Oil seeds, Oil Nuts and Oil Kernels	-3.79 (-0.52)	0.77[b] (2.67)	0.31	7.13[e]	1.48[f]
2311	Natural Rubber	-3.64 (-0.45)	1.49[d] (1.29)	0.09	1.65	1.81[f]
2836	Ores and Concentrates of Tin	0.53 (0.05)	1.19[a] (3.75)	0.4678	14.06[e]	1.70[f]
4222	Palm Oil	-4.28 (-0.46)	0.18 (0.99)	0.06	0.97	1.77[f]
6871	Tin and Tin Alloys, unwrought	-7.65 (-1.31)	1.02[a] (11.58)	0.89	134.15[e]	1.19[g]

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 2.5% level.
[c]The estimate is significantly nonzero at the 5.0% level.
[d]The estimate is significantly nonzero at the 25.0% level.
[e]The F-statistics indicate significantly nonzero at 5.0% level.
[f]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[g]The Dubin-Watson tests indicate inconclusive results at the 5.0% level.
[h]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in parentheses are t-statistics

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.3

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND PRICE FLUCTUATIONS IN INDONESIA'S SELECTED EXPORT COMMODITIES, 1955-1976

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\,(PI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(PI)_i$ is fluctuations in price of export i,
α , β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[f]
075	Spices	-1.49 (-0.27)	0.92[a] (5.66)	0.67	32.07[c]	2.21[d]
121	Tobacco, unmanufactured	1.27 (0.27)	0.90[a] (5.81)	0.68	33.79[c]	1.48[d]
221	Oil Seeds, Oil Nuts and Oil Kernels	-3.02 (-0.46)	0.68[a] (3.65)	0.45	13.30[c]	2.51[d]
2311	Natural Rubber	-0.03 (-0.02)	1.01[a] (19.59)	0.96	383.91[c]	2.72[e]
2836	Ores and Concentrates of Tin	1.37 (0.13)	0.92[a] (3.74)	0.4666	14.00[c]	2.50[d]
4222	Palm Oil	-2.89 (-0.48)	0.73[a] (4.95)	0.61	24.49[c]	2.35[d]
6871	Tin and Tin Alloys, unwrought	-9.23 (-0.58)	1.24[b] (2.12)	0.22	4.44	1.65[d]

[a]The estimate is significantly nonzero at the 0.5% level,
[b]The estimate is significantly nonzero at the 5.0% level,
[c]The F-statistics indicate significantly nonzero at 5.0% level,
[d]The Dubin-Watson tests indicate no autocorrelation at the 0.5% level,
[e]The Dubin-Watson tests indicate inconclusive results at the 5.0% level,
[f]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are t-statistics

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.4

IDENTIFICATION OF SOURCES OF INSTABILITY IN EARNINGS OF INDONESIA'S SELECTED EXPORT COMMODITIES

SITC	Export Commodity	Demand Shifts	Supply Shifts	Case Number
075	Spices	✓		III
121	Tobacco, unmanufactured	✓		III
221	Oil Seeds, Oil Nuts and Oil Kernels	✓		III
2311	Natural Rubber	✓		III
2836	Ores and Concentrates of Tin	✓		Inconclusive
4222	Palm Oil		✓	I
6871	Tin and Tin Alloys, unwrought	✓		IV

Note: Case I: Supply shifts and inelastic demand.
Case II: Supply shifts and elastic demand.
Case III: Demand shifts and inelastic supply.
Case IV: Demand shifts and elastic supply.

Source: The process of identification is by examining the results in Tables 3.1, 3.2 and 3.3.

is the only one commodity which fall in the supply-shift case and is put in case I (i.e. supply shifts and inelastic demand). Finally, most of the selected commodities of Indonesia have prices fluctuations higher than those of quantities, regardless of the fluctuations in earnings (see Table 3.1), and their instability origin (i.e. case I and case III in Table 3.4). And RI of the commodities which fall in case I and case III are highly correlated to PI rather than QI (see Tables 3.2 and 3.3).

To conclude, Indonesia's selected primary commodities have high fluctuations in export earnings mainly due to the shifts in demand affecting the earnings through the fluctuations in prices rather than quantities.

b) Malaysia

The instability indices of prices, quantities and earnings of individual selected commodities in Malaysia are shown in Table 3.5. Tables 3.6 and 3.7 contain the results of linear least-square regression between RI and QI, and between RI and PI respectively. The results of source identification of earnings instability for individual selected export commodities in Malaysia are shown in Table 3.8. The first observation on the overall results in Table 8 is that oil seeds, coconut oil and tin alloys have the explosive movements in earnings, while spices, natural rubber and palm oil have the non-explosive ones. In other words, among the foodstuffs,

TABLE 3.5

AVERAGE ANNUAL FIGURES FOR THE ABSOLUTE VALUES OF PERCENTAGE DEVIATION FROM FIVE-YEAR MOVING AVERAGE OF PRICE, QUANTITY AND EARNINGS OF MALAYSIA'S SELECTED EXPORT COMMODITIES, 1956-1975[a]

SITC	Export Commodity	Price Fluctuations (%)	Quantity Fluctuations (%)	Earnings Fluctuations (%)	Period Coverage
075[b]	Spices	13.09	11.10	12.24	1960-75
221[c]	Oil Seeds, Oil Nuts and Oil Kernels	15.81	12.75	26.57	1960-75
2311	Natural Rubber	57.38	3.24	16.55	1956-75
4222	Palm Oil	11.84	4.67	11.41	1956-75
4223	Coconut (Copra) Oil	12.01	18.67	18.84	1956-75
6871[d]	Tin and Tin Alloys, unwrought	7.07	8.17	10.24	1956-75

[a]Malaysia here included West Malaysia, Sabah (North Borneu) and Sarawak.
[b]Sabah's export of SITC 075 is excluded for 1961 and the data of SITC 0751 is used as the estimate for 1970 period.
[c]The data for 1961 is from FAO Trade Yearbook.
[d]The data for 1973 is from UN Commodity Trade Statistics.

Note: All fluctuations are measured in terms of percentage deviations from five-year moving averages.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.6

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND QUANTITY FLUCTUATIONS IN MALAYSIA'S SELECTED EXPORT COMMODITIES, 1956-1975

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\ (QI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(QI)_i$ is fluctuations in quantity of export i,
α , β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[f]
075	Spices	-3.72 (-0.95)	0.56[b] (1.86)	0.26	3.47	1.73
221	Oil Seeds, Oil Nuts and Oil Kernels	0.85 (0.14)	1.60[a] (3.92)	0.61	15.37[c]	2.39
2311	Natural Rubber	-1.67 (-0.59)	3.85[a] (5.92)	0.72	35.04[c]	2.07[d]
4222	Palm Oil	-7.95 (-2.01)	-0.19 (-0.32)	0.01	0.10	1.14[e]
4223	Coconut (Copra) Oil	-2.86 (-0.76)	0.93[a] (5.31)	0.67	28.21[c]	1.60[d]
6871	Tin and Tin Alloys, unwrought	-2.88 (-1.27)	0.82[a] (4.04)	0.54	16.29[c]	1.30[e]

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 10.0% level.
[c]The F-statistics indicate significantly nonzero at 5.0% level.
[d]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[e]The Dubin-Watson tests indicate inconclusive results at the 5.0% level.
[f]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are t-statistics.

Source: Computed from data on UN Yearbook of International Trade Statistics, various issues.

TABLE 3.7

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND PRICE FLUCTUATIONS IN MALAYSIA'S SELECTED EXPORT COMMODITIES, 1956-1975

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\ (PI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(PI)_i$ is fluctuations in price of export i,
α, β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[h]
075	Spices	-1.65 (-0.42)	0.55[c] (2.03)	0.29	4.12	2.38
221	Oil Seeds, Oil Nuts and Oil Kernels	3.83 (0.64)	1.26[a] (4.34)	0.65	18.85[d]	1.41
2311	Natural Rubber	-1.14 (-0.23)	0.53 (1.17)	0.09	1.37	2.18[e]
4222	Palm Oil	-3.71 (-2.12)	0.84[a] (7.29)	0.79	1.83	53.16[f]
4223	Coconut (Copra) Oil	-4.63 (-0.83)	0.75[b] (2.24)	0.26	5.01[d]	1.92[e]
6871	Tin and Tin Alloys, unwrought	-1.85 (0.63)	0.78[b] (2.37)	0.29	5.61[d]	1.31[g]

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 5.0% level.
[c]The estimate is significantly nonzero at the 10.0% level.
[d]The F-statistics indicate significantly nonzero at the 5.0% level.
[e]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[f]The Dubin-Watson tests indicate negative autocorrelation at the 5.0% level.
[g]The Dubin-Watson tests indicate inconclusive autocorrelation at the 5.0% level.
[h]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are the t-statistics.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.8

IDENTIFICATION OF SOURCES OF INSTABILITY IN EARNINGS OF MALAYSIA'S SELECTED EXPORT COMMODITIES

SITC	Export Commodity	Demand Shifts	Supply Shifts	Case Number
075	Spices		✓	I
221	Oil Seeds, Oil Nuts and Oil Kernels	✓		III
2311	Natural Rubber		✓	Inconclusive
4222	Palm Oil		✓	I
4223	Coconut (Copra) Oil	✓		IV
6871	Tin and Tin Alloys, unwrought	✓		IV

Note: Case I: Supply shifts and inelastic demand.
Case II: Supply shifts and elastic demand.
Case III: Demand shifts and inelastic supply.
Case IV: Demand shifts and elastic supply.

Source: The process of identification is by examining the results in Tables 3.5, 3.6 and 3.7.

the earnings instability of oil seeds and coconut oil are due to demand causes, and in contrast those of spices and palm oil are subject to supply shifts. For raw material commodities, the earnings fluctuations of natural rubber are caused by supply shifts but those of tin alloys are caused by shifts in demand (see Table 3.8). After examining the degree of fluctuation of price and quantity in Table 3.5 and the correlation between RI and PI, and between RI and QI in Tables 3.6 and 3.7, spices and palm oil are classified into case I (i.e. supply shifts and inelastic demand). Coconut oil and tin alloys fall in case IV (i.e. demand shifts and elastic supply) and oil seeds is in case III (i.e. demand shifts and inelastic supply). Only natural rubber is inconclusive since its price fluctuations are much higher than quantity fluctuations but the correlation between RI and PI is lower than that between RI and QI (see Tables 3.5, 3.6 and 3.7). It can be observed that there is no sufficient evidence that the numbers of commodities whose earnings instability are closely related to price (cases I and III) is larger than the numbers of commodities which RI are closely related to QI (case IV).

c) The Philippines

The instability indices of prices, quantities and earnings of individual selected export commodities in Philippines are shown in Table 3.9. Tables 3.10 and 3.11 contain the results of the linear least-square regression between RI and QI, and between RI and PI

TABLE 3.9

AVERAGE ANNUAL FIGURES FOR THE ABSOLUTE VALUES OF PERCENTAGE DEVIATION FROM FIVE-YEAR MOVING AVERAGE OF PRICE, QUANTITY, AND EARNINGS OF THE PHILIPPINES' SELECTED EXPORT COMMODITIES, 1955-1976

SITC	Export Commodity	Price Fluctuations (%)	Quantity Fluctuations (%)	Earnings Fluctuations (%)	Period Coverage
0611[a]	Raw Sugar	8.34	8.23	14.89	1955-76
121	Tobacco, unmanufactured	12.96	15.45	13.09	1961-76
221[b]	Oil Seeds, Oil Nuts and Oil Kernels	10.10	15.52	9.46	1961-76
4223	Coconut (Copra) Oil	18.39	13.36	19.16	1955-76

[a]The data of SITC 0611 during 1955-1967 are those of "contrifugal" only.

[b]The data are of copra (SITC 2212) only.

Note: All fluctuations are measured in terms of percentage deviations from five-year moving averages.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.10

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND QUANTITY FLUCTUATIONS IN THE PHILIPPINES' SELECTED EXPORT COMMODITIES, 1955-1976

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\ (QI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(QI)_i$ is fluctuations in quantity of export i,
α, β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[d]
0611	Raw Sugar	-0.45 (-0.11)	1.18[a] (2.94)	0.35	8.66[b]	1.75[c]
121	Tobacco, unmanufactured	-3.25 (-0.66)	0.32 (1.20)	0.15	1.44	1.07
221	Oil Seeds, Oil Nuts and Oil Kernels	-1.66 (-0.41)	0.23 (1.22)	0.16	1.48	1.30
4223	Coconut (Copra) Oil	-1.30 (-0.20)	0.17 (0.45)	0.01	0.20	1.64[c]

[a]The estimate is significantly nonzero at the 1.0% level.
[b]The F-statistics indicate significantly nonzero at the 5.0% level.
[c]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[d]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are the t-statistics.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.11

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND PRICE FLUCTUATIONS IN THE PHILIPPINES' SELECTED EXPORT COMMODITIES, 1955-1976

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta} (PI)_i$$

where, $(RI)_i$ is fluctuations in earning from export i,
$(PI)_i$ is fluctuations in price of export i,
α, β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[e]
0611	Raw Sugar	-1.27 (-0.49)	1.08[a] (7.17)	0.76	51.43[c]	1.84[d]
121	Tobacco, unmanufactured	0.20 (0.04)	0.39[b] (1.46)	0.21	2.13	1.83[d]
221	Oil Seeds, Oil Nuts and Oil Kernels	-0.28 (-0.06)	0.14 (0.57)	0.04	0.32	1.20
4223	Coconut (Copra) Oil	-4.09 (-1.18)	0.67[a] (1.27)	0.71	39.31[c]	1.55[d]

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 25.0% level.
[c]The F-statistics indicate significantly nonzero at the 5.0% level.
[d]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[e]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are the t-statistics.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.12

IDENTIFICATION OF SOURCES OF INSTABILITY IN EARNINGS OF THE PHILIPPINES' SELECTED EXPORT COMMODITIES

SITC	Export Commodity	Demand Shifts	Supply Shifts	Case Number
0611	Raw Sugar	✓		III
121	Tobacco, unmanufactured		✓	Inconclusive
221	Oil Seeds, Oil Nuts and Oil Kernels		✓	II
4223	Coconut (Copra) Oil	✓		III

Note: Case I: Supply shifts and inelastic demand.
Case II: Supply shifts and elastic demand.
Case III: Demand shifts and inelastic supply.
Case IV: Demand shifts and elastic supply.

Source: The process of identification is by examining the results in Tables 3.9, 3.10 and 3.11.

respectively. The results of source identification of earnings instability for individual selected commodities of the Philippines are shown in Table 3.12. All selected commodities in Table 12 are foodstuffs but only two, namely, raw sugar and coconut oil, have explosive movements in earnings and both are classified in case III (i.e. demand shifts and inelastic supply) as shown in Table 3.12. Oil seeds, in which we consider only copra, have a non-explosive movement and hence supply shifts can be claimed to be the dominant source of earnings instability. In Tables 3.10 and 3.11, the correlation between RI and QI of oil seeds is higher than that between RI and PI, therefore, the supply shifts of oil seeds is coupled with elastic demand as in case II (see Table 3.12). For tobacco, we can only identify the source of earnings instability which is due to supply shifts. We cannot determine the elasticity of demand for tobacco since the result of the degrees of QI and PI in Table 3.9 contradicts the results of the correlation between RI and QI and that between RI and PI of tobacco in Tables 3.10 and 3.11 respectively. In other words, the classification of tobacco is inconclusive.

d) Singapore

The instability indices of prices, quantities and earnings of Singapore's individual selected commodities are shown in Table 3.13. Tables 3.14 and 3.15 present the linear least-square regression between RI and QI, and between RI and PI of each commodity

TABLE 3.13

AVERAGE ANNUAL FIGURES FOR THE ABSOLUTE VALUES OF PERCENTAGE DEVIATION FROM FIVE-YEAR MOVING AVERAGE OF PRICE, QUANTITY, AND EARNINGS OF SINGAPORE'S SELECTED EXPORT COMMODITIES, 1957-1976

SITC	Export Commodity	Price Fluctuations (%)	Quantity Fluctuations (%)	Earnings Fluctuations (%)	Period Coverage
075	Spices	9.93	11.96	7.70	1962-76
221[a]	Oil Seeds, Oil Nuts and Oil Kernels	11.52	27.85	34.27	1962-76
2311	Natural Rubber	13.97	8.53	17.98	1957-76
2836	Ores and Concentrates of Tin	17.18	32.58	22.94	1962-76
4222	Palm Oil	14.01	8.31	16.12	1957-76
4223	Coconut (Copra) Oil	16.74	13.86	17.59	1957-76

[a]The data for the period of 1973-76 are from UN Commodity Trade Statistics.

Note: All fluctuations are measured in terms of percentage deviations from five-year moving averages.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.14

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND QUANTITY FLUCTUATIONS OF SINGAPORE'S SELECTED EXPORT COMMODITIES, 1957-1976

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\ (QI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(QI)_i$ is fluctuations in quantity of export i,
α, β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[g]
075	Spices	-3.35 (-1.25)	0.37[c] (1.88)	0.28	3.55	1.89
221	Oil Seeds, Oil Nuts and Oil Kernels	1.05 (0.27)	1.17[a] (10.06)	0.92	101.23[e]	2.09
2311	Natural Rubber	1.15 (0.26)	1.35[b] (3.04)	0.40	9.25[e]	1.66[f]
2836	Ores and Concentrates of Tin	-3.79 (-0.71)	0.44[b] (3.67)	0.60	13.44[e]	3.20
4222	Palm Oil	-0.70 (-0.13)	0.88[d] (1.56)	0.15	2.42	1.79[f]
4223	Coconut (Copra) Oil	0.77 (0.13)	0.54[d] (1.72)	0.18	2.97	1.68[f]

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 1.0% level.
[c]The estimate is significantly nonzero at the 10.0% level.
[d]The estimate is significantly nonzero at the 25.0% level.
[e]The F-statistics indicate significantly nonzero at the 5.0% level.
[f]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[g]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are the t-statistics.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.15

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND PRICE FLUCTUATIONS OF SINGAPORE'S SELECTED EXPORT COMMODITIES, 1957-1976

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\ (PI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(PI)_i$ is fluctuations in price of export i,
α, β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[e]
075	Spices	-4.81 (-1.63)	0.18 (0.67)	0.05	0.45	1.52
221	Oil Seeds, Oil Nuts and Oil Kernels	-7.59 (-0.64)	1.34[b] (1.56)	0.21	2.43	1.88
2311	Natural Rubber	-0.14 (-0.06)	1.12[a] (7.30)	0.79	53.33[c]	1.52[d]
2836	Ores and Concentrates of Tin	-5.63 (-0.75)	-0.51[b] (-1.50)	0.20	2.24	2.63
4222	Palm Oil	0.23 (0.08)	1.06[a] (6.62)	0.76	43.81[c]	1.41[d]
4223	Coconut (Copra) Oil	-2.64 (-0.58)	0.65[a] (3.64)	0.49	13.24[c]	2.22[d]

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 25.0% level.
[c]The F-statistics indicate the significantly nonzero at the 5.0% level.
[d]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[e]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are the t-statistics

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.16

IDENTIFICATION OF SOURCES OF INSTABILITY IN EARNINGS OF SINGAPORE'S SELECTED EXPORT COMMODITIES

SITC	Export Commodity	Demand Shifts	Supply Shifts	Case Number
075	Spices		✓	II
221	Oil Seeds, Oil Nuts and Oil Kernels	✓		IV
2311	Natural Rubber	✓		III
2836	Ores and Concentrates of Tin		✓	II
4222	Palm Oil	✓		III
4223	Coconut (Copra) Oil	✓		III

Note: Case I: Supply shifts and inelastic demand.
Case II: Supply shifts and elastic demand.
Case III: Demand shifts and inelastic supply.
Case IV: Demand shifts and elastic supply.

Source: The process of identification is by examining the results in Tables 3.13, 3.14, and 3.15.

respectively. The results of some identification of individual selected commodities' earnings fluctuations are caused by the shifts in demand (see Table 3.16) indicated by the explosive movements in earnings of those commodities (see Table 3.13). These commodities consist of foodstuffs (spices, oil seeds, palm oil and coconut oil) and raw material (natural rubber) (see Tables 3.13 and 3.16). Natural rubber, palm oil and coconut oil are classified in case III (i.e. demand shifts and inelastic supply), since each has its PI higher than QI (see Table 3.13), and the correlation between RI and PI is higher than that between RI and QI (see Tables 3.14 and 3.15). Among the demand-shifts cases, only oil seeds are classified in case IV which is demand shifts with an elastic supply. Spices and tin concentrates fall in supply shifts and elastic demand (see Tables 3.13, 3.14, 3.15, and 3.16). For Singapore, the numbers of commodities which earnings fluctuations are highly correlated with prices (case III in Table 3.16) are equal to the numbers of commodities whose earnings fluctuations are highly correlated to quantity fluctuation (case II and case IV in Table 3.16).

e) Thailand

The instability indices of prices, quantities and earnings of individual selected export commodities in Thailand are shown in Table 3.17. Tables 3.18 and 3.19 contain the results of linear least-square between RI and QI, and between RI and PI respectively.

TABLE 3.17

AVERAGE ANNUAL FIGURES FOR THE ABSOLUTE VALUES OF PERCENTAGE DEVIATION FROM FIVE-YEAR MOVING AVERAGE OF PRICE, QUANTITY, AND EARNINGS OF THAILAND'S SELECTED EXPORT COMMODITIES, 1955-1975

SITC	Export Commodity	Price Fluctuations (%)	Quantity Fluctuations (%)	Earnings Fluctuations (%)	Period Coverage
0611[a]	Raw Sugar	66.98	38.86	45.88	1961-75
075[b]	Spices	9.54	26.83	28.22	1955-75
121	Tobacco, unmanufactured	8.32	22.01	26.07	1955-75
221	Oil Seeds, Oil Nuts and Oil Kernels	10.80	11.63	11.54	1955-75
2311[c]	Natural Rubber	23.77	5.39	16.31	1955-75
2836	Ores and Concentrates of Tin	10.97	17.97	21.63	1955-67
6871[d]	Tin and Tin Alloys, unwrought	8.19	8.60	10.47	1965-75

[a]The data are from FAO Trade Yearbook.
[b]The data for the period of 1967-1975 are from UN Commodity Trade Statistics, various issues.
[c]The data for 1966 are from UN Commodity Trade Statistics.
[d]SITC 6871 is used as the estimate for those of 1965.

Note: All fluctuations are measured in terms of percentage deviations from five-year moving average.

Source: Computed from data mainly in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.18

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND QUANTITY FLUCTUATIONS OF THAILAND'S SELECTED EXPORT COMMODITIES, 1955-1975

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta} (QI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(QI)_i$ is fluctuations in quantity of export i,
α, β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[g]
0611	Raw Sugar	-16.13 (-0.97)	0.53[c] (1.51)	0.20	2.29	2.28
075	Spices	1.10 (0.33)	0.91[a] (9.40)	0.86	88.27[d]	2.20[e]
121	Tobacco, unmanufactured	-2.11 (-0.78)	1.13[a] (13.16)	0.92	173.09[d]	1.10[f]
221	Oil Seeds, Oil Nuts and Oil Kernels	-1.07 (-0.30)	0.32 (1.18)	0.09	1.40	2.04[e]
2311	Natural Rubber	-1.33 (-0.34)	2.19[a] (3.62)	0.47	13.12[d]	2.04[e]
2836	Ores and Concentrates of Tin	0.65 (0.18)	1.25[a] (7.81)	0.90	60.96[d]	1.54
6871	Tin and Tin Alloys, unwrought	-6.39 (-1.80)	1.40[b] (4.41)	0.80	19.46[d]	1.20

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 1.0% level.
[c]The estimate is significantly nonzero at the 25.0% level.
[d]The F-statistics indicate significantly nonzero at the 5.0% level.
[e]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level
[f]The Dubin-Watson tests indicate positive autocorrelation at the 5.0% level.
[g]No superscript is designated to the Dubin-Watson tests which cannot be done because of insufficient observations.

Note: The figures in the parentheses are the t-statistics.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.19

REGRESSION RESULTS ON THE RELATIONSHIP BETWEEN EARNINGS FLUCTUATIONS AND PRICE FLUCTUATIONS OF THAILAND'S SELECTED EXPORT COMMODITIES, 1955-1975

$$(RI)_i = \underset{(t_\alpha)}{\alpha} + \underset{(t_\beta)}{\beta}\ (PI)_i$$

where, $(RI)_i$ is fluctuations in earnings from export i,
$(PI)_i$ is fluctuations in price of export i,
α, β are a constant and a coefficient respectively, and
t_α, t_β are t-statistics of α and β respectively.

SITC	Export Commodity	α (t_α)	β (t_β)	R^2	F	D.W.[f]
0611	Raw Sugar	-23.74 (-1.34)	0.07 (0.36)	0.01	0.13	1.55
075	Spices	-0.99 (-0.11)	0.38 (0.50)	0.02	0.25	2.46[d]
121	Tobacco, unmanufactured	-2.32 (-0.35)	2.29 (4.11)	0.53	16.92[c]	1.26[e]
221	Oil Seeds, Oil Nuts and Oil Kernels	-0.69 (-0.24)	0.54[a] (3.29)	0.42	10.84[c]	2.57[d]
2311	Natural Rubber	-1.85 (-0.35)	-0.05 (-0.30)	0.01	0.09	1.89[d]
2836	Ores and Concentrates of Tin	1.45 (0.20)	1.28[b] (3.19)	0.59	10.20[c]	2.07
6871	Tin and Tin Alloys, unwrought	6.53 (0.73)	0.87 (0.96)	0.16	0.92	1.02

[a]The estimate is significantly nonzero at the 0.5% level.
[b]The estimate is significantly nonzero at the 2.5% level.
[c]The F-statistics indicate significantly nonzero at the 5.0% level.
[d]The Dubin-Watson tests indicate no autocorrelation at the 5.0% level.
[e]The Dubin-Watson tests indicate inconclusive results at the 5.0% level.
[f]No superscript is designated to the Dubin-Watson test which cannot be done because of insufficient observations.

Note: The figures in the parentheses are the t-statistics.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 3.20

IDENTIFICATION OF SOURCES OF INSTABILITY IN EARNINGS OF THAILAND'S SELECTED EXPORT COMMODITIES

SITC	Export Commodity	Demand Shifts	Supply Shifts	Case Number
0611	Raw Sugar		✓	Inconclusive
075	Spices	✓		IV
121	Tobacco, unmanufactured	✓		IV
221	Oil Seeds, Oil Nuts and Oil Kernels		✓	Inconclusive
2311	Natural Rubber		✓	Inconclusive
2836	Ores and Concentrates of Tin	✓		IV
6871	Tin and Tin Alloys, unwrought	✓		IV

Note: Case I: Supply shifts and inelastic demand.
Case II: Supply shifts and elastic demand.
Case III: Demand shifts and inelastic supply.
Case IV: Demand shifts and elastic supply.

Source: The process of identification is by examining the results in Tables 3.17, 3.18 and 3.19.

The results of source identification of Thailand's individual selected export commodities are shown in Table 3.20. Such foodstuffs as spices and tobacco, and such raw material as tin concentrates and tin alloys all have explosive movements in earnings (see Table 3.17) and the correlation between RI and QI of these commodities are higher than that between RI and PI (see Tables 3.18 and 3.19). Therefore, shifts in demand are identified to be the dominant cause of earnings fluctuations in spices, tobacco, tin concentrates and tin alloys in Thailand's selected export commodities. All of them are also classified in case IV (i.e. demand shifts and elastic supply) as shown in Table 3.20. But for raw sugar, oil seeds and natural rubber, all are found to be in the supply shifts cases, since they have the non-explosive movement in earnings fluctuations (see Tables 3.17 and 3.20). But all of them cannot be classified into any particular case since each has the contradictory results between the degrees of PI and QI, and the correlation between RI and QI and between RI and PI (see Tables 3.17, 3.18 and 3.19). Thus, raw sugar, oil seeds and natural rubber have the shifts in demand as their earnings instability origin but they are inconclusive in their classification (see Table 3.20). Our findings are mostly the same as those of Koomsup[9] in the cases of tobacco, sugar, tin concentrates and tin alloys. Koomsup and our findings in tobacco and sugar are different from those

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[9]Praiphol Koomsup, op.cit., pp. 95.

of Pupphavesa[10] though the same methodology is employed. These may be the results of a significant difference in the time periods covered.

2. Commodity-by-Commodity Study

The selected commodities for ASEAN as a whole contain nine commodities in which there are six food-type commodities and three kinds of raw materials. The results of source identification of individual selected commodities are shown in Table 3.21. The first observation from the results in Table 3.21 is that different exporting countries in ASEAN are likely to have different sources of earnings instability (i.e. shifts in demand or supply) in the same export commodity, except in palm oil and tin alloys (see Table 3.21). The second observation is that some countries export the same commodity and face the same source of instability, they are classified into different case numbers. A good sample of this second observation is the case of coconut oil. Another commodity which reflects both observations is spices. The possible explanation of these results is that different exporting countries may have different internal and external circumstances in the same period of time.

The different sources of earnings instability in each commodities cause difficulties in evaluating the dominant sources of instability for an ASEAN stabilization policy. The implications

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[10] Wisarn Pupphavesa, "Export Instability in ASEAN Countries," op.cit. , pp. 4.34-4.35.

TABLE 3.21

IDENTIFICATION OF SOURCES OF INSTABILITY IN EARNINGS OF ASEAN COUNTRIES' SELECTED COMMODITIES

SITC	Export Commodity	Exporting Country	Demand Shifts	Supply Shifts	Case Number
0611	Raw Sugar	Philippines	✓		III
		Thailand		✓	Inconclusive
075	Spices	Indonesia	✓		III
		Malaysia		✓	I
		Singapore		✓	II
		Thailand	✓		IV
121	Tobacco, unmanufactured	Indonesia	✓		III
		Philippines		✓	Inconclusive
		Thailand	✓		IV
221	Oil Seeds, Oil Nuts and Oil Kernels	Indonesia	✓		III
		Malaysia	✓		III
		Philippines		✓	II
		Singapore	✓		IV
		Thailand		✓	Inconclusive
2311	Natural Rubber	Indonesia	✓		III
		Malaysia		✓	Inconclusive
		Singapore	✓		III
		Thailand		✓	Inconclusive
2836	Ores and Concentrates of Tin	Indonesia	✓		Inconclusive
		Singapore		✓	II
		Thailand	✓		IV
4222	Palm Oil	Indonesia		✓	I
		Malaysia		✓	I
		Singapore	✓		III
4223	Coconut (Copra) Oil	Malaysia	✓		IV
		Philippines	✓		III
		Singapore	✓		III
6871	Tin and Tin Alloys, unwrought	Indonesia	✓		IV
		Malaysia	✓		IV
		Thailand	✓		IV

Note: Case I: Supply shifts and inelastic demand.
Case II: Supply shifts and elastic demand.
Case III: Demand shifts and inelastic supply.
Case IV: Demand shifts and elastic supply.

Source: Reproduced from Tables 3.4, 3.8, 3.12, 3.16 and 3.20.

drawn from the results of source identification for stabilization policy, especially price stabilization, will be discussed in the next section. At this stage we try to investigate the findings of source identification in ASEAN selected export commodities in order to provide some background for stabilization policy. We will consider one commodity which is the exports of different countries as if they were different commodities since the same commodity may have different sources of instability when it is expected by different countries. For instance, spices will be counted as four commodities since it is exported by Indonesia, Malaysia, Singapore and Thailand. The justification of this type of analysis is that it gives the same weight to every exporting country among ASEAN, especially for the stabilization policy purpose. There are 19 selected commodities whose earnings fluctuations are mainly caused by demand shifts and 11 commodities which are subject to supply shifts (see Table 3.21). The next observation is that there are 11 commodities whose earnings fluctuations are highly correlated to the fluctuations in quantities (i.e. case II and case IV in Table 3.21). And the commodities whose earnings fluctuations are highly correlated to the fluctuations in prices (i.e. case I and case III in Table 3.21) total 13 and 6 commodities are inconclusive in the comparison of their correlation between RI and QI, and that between RI and PI. With these simple observations, their implications for stabilization policy will be discussed in the following section.

D. Some Policy Implications for Stabilization Policy

Stabilization policies for alleviating export earnings fluctuations of primary commodities consist of two types, namely price stabilization scheme and compensatory financing scheme. The price stabilization scheme will be examined in this section based on the findings of source identification in the preceding section. The summary of the effects of price stabilization via international buffer stock on the earnings level, export earnings stability and welfare are presented in Table 1.1 in the literature survey section of this study.

From Tables 1.1 and 3.21, the results show that the ASEAN countries' export earnings stability could be achieved in those commodities with demand shift case (i.e. case III and case IV in Table 3.21) and the supply shift case with inelastic demand (i.e. case I in Table 3.21). There are 19 commodities[11] which fall in demand-shift case. Only three commodities are supply-shift case with inelastic demand (case I in Table 3.21), namely spices and palm oil of Malaysia and palm oil of Indonesia. It is not certain that export earnings stability of these three commodities will be stabilized since we do not know the supply elasticity in supply-shift case which is required to be sufficiently inelastic.[12] For the demand-shift case, a country has to trade off between earnings stability, and lower export

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[11] Numbers of commodities are counted on the individual exporting country basis as earlier mentioned.

[12] See footnote 3 of Table 1.1.

earnings level and pure welfare effect.[13] Similarly, for eleven commodities which fall in the supply-shift case, the ASEAN countries also have to trade off between destabilized export earnings, and more export earnings level and pure welfare effects (see Table 1.1) eventhough there are three commodities (case I in Table 3.21) which are likely to have both more export earnings level and stabilized earnings. But this conclusion is indefinite since the values of supply elasticities are not known from the above analysis, however, we still cannot make any conclusion on the net effects of price stabilization for the ASEAN selected commodities, since only the numbers of demand-shift cases and supply-shift cases cannot give us the answer, unless the quantitative effects are known.

Another way to examine the possibility of price stabilization is to evaluate whether most commodities have high correlation between RI and QI or between RI and PI. If most commodities have high correlation between RI and PI, the price stabilization scheme via international buffer stock will be provided for mitigating ASEAN countries' export earnings instability. Using this concept, the commodities which have high correlation between RI and PI in the ASEAN selected export commodities total 13 commodities (i.e. the ones which fall in case I and case III in Table 3.21) accounted for 1891 million US dollars or 49.60 percent of total export earnings

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[13]Measure of pure welfare effect was defined in footnote 2 in Table 1.1.

TABLE 3.22

EXPORT EARNINGS OF THE SELECTED PRIMARY COMMODITIES OF ASEAN CATEGORIZED IN CASES OF SOURCES OF INSTABILITY, AVERAGE OVER 1970-1975
(Thousand US dollars)

Country	Export Earnings			
	Case I + Case III	Case II + Case IV	Inconclusive Case	All Cases
Indonesia	468,933	47,043	46,708	562,684
Malaysia	294,287	426,071	763,315	1,483,673
Philippines	549,056	130,411	22,436	701,903
Singapore	579,522	66,239	-	645,761
Thailand	-	151,700	268,410*	420,110
ASEAN	1,891,798 (49.60)	821,464 (21.54)	1,100,869 (28.86)	3,814,131 (100.0)

*Data in 1960-1965 are used for tin concentrates of Thailand which is one of the inconclusive cases of Thailand.

Note: Figures in the parentheses are the percentage shares of each case (each column) in the total value of all cases.

Case I: Supply shifts and inelastic demand.
Case II: Supply shifts and elastic demand.
Case III: Demand shifts and inelastic supply.
Case IV: Demand shifts and elastic supply.

Source: Reproduced from Table 3.21 and computed from data in UN Yearbook of International Trade Statistics, various issues.

of selected commodities of ASEAN (see Table 3.22). Eleven commodities have high correlation between RI and QI (i.e. case II and case IV in Table 3.21) accounted for 821 million US dollars or 21.54 percent of total export earnings of selected commodities of ASEAN (see Table 3.22). There are six commodities which are inconclusive. Because of these six inconclusive cases, the tentative conclusion still cannot be made. Since these six commodities accounted for substantial share in ASEAN, selected commodities exports that is 1,100 million US dollars or 28.86 percent.

Two conclusions can be drawn from the analysis. First, with price stabilization policy, there is a tendency for the ASEAN countries to trade off between the export earnings stability, and the export earnings levels and pure welfare effects. Second, from our simple analysis the definite conclusion cannot be made unless the exact quantitative results of demand and supply elasticities must be known in determining the effects of price stabilization on the selected commodities of ASEAN countries.

CHAPTER IV

COMPENSATORY FINANCING SCHEMES FOR ASEAN

A. Introduction

In Chapter III we have identified the source of instability in export earnings of ASEAN selected commodities from which the implications for price stabilization scheme have been drawn to be indefinite. Therefore, in this chapter we try to examine the compensatory financing scheme which seems to be better alternative to stabilize export earnings in selected primary commodities of ASEAN countries. Section B will present the conceptual framework of compensatory financing scheme. The methodology employed for ASEAN compensatory financing scheme will be discussed in Section C. Finally, the empirical results will be shown in Section D and the concluding remark will be presented in Section E.

B. Conceptual Framework of Compensatory Financing Scheme

Compensatory financing defined in a strict sense consists of a fund which stabilizes a country's export earnings over a medium-term trend by compensating for shortfalls from the trend and requiring repayment when export earnings rise above the trend. The existing compensatory financing schemes are considered as the aid instruments in the sense that the developed countries as the importing countries of primary commodities transfer the financial grants to the

less-developed countries which suffer from the high fluctuations in earnings of their primary commodities exports. The needs of this type of scheme rise up rapidly among LDC's with sluggish response from DC's. But this study proposes the compensatory financing scheme for ASEAN countries which is less dependent on the developed countries. The idea is pooling financial resource among member countries of ASEAN. This compensatory financing scheme for ASEAN will initiate an amount of fund either by members' contributions or borrowing from financial institutions. This initiated fund, hereafter referred to as "The Fund", will be utilized at the beginning of the compensatory financing scheme to compensate the earnings shortfalls of member countries of ASEAN. Each member will be compensated in the year of earnings shortfalls and has to pay back to the Fund if the earnings rise above the agreed trend. The Fund tends to be minimal if the earnings fluctuations among member countries or among commodities are in opposite directions and vice versa. The main features of the compensatory financing scheme for ASEAN will be presented in detail in Section C.

C. Methodology for ASEAN Compensatory Financing Scheme

Several variants of ASEAN compensatory financing scheme are conceivable with different sets of alternative choices in such properties as the target level, the terms and conditions of compensation and repayment. This section discusses the appropriateness

of the variants in regard to these main features of ASEAN compensatory financing scheme. This study performs simulations of various variants. of compensatory financing scheme for ASEAN countries assuming they had been in operation during the period 1962-1975.

1. Country Coverage and Commodity Coverage

Since the scheme is proposed to be independent to the commodity-importing countries such as Japan or other developed countries, the country coverage includes only members of ASEAN namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. Malaysia consists of West Malaysia, Sabah (North Borneo) and Sarawak.

The criteria for commodity selection for commodity coverage are the same as those stated in Chapter 2 and they are restated here for continuity in contents. First, only primary commodities under Standard International Trade Classification (SITC 0, 1, 2, 4 and 68) are covered. Second, the selected commodities must not be traded among member countries. Since if they are so traded, the earnings of one member can be the expenses of others. Finally, each commodity must be traded by at least two member countries so that there are counterpartners to transfer fund in case there is an offsetting effect among members advocating the idea of pooling financial resources of the scheme. The selected commodities and the exporting countries of ASEAN are shown in Table 2.2 to guarantee the significances of the selected commodities for the compensatory financing scheme, Table 4.1 presents the export

TABLE 4.1

ASEAN EXPORT EARNINGS OF SELECTED PRIMARY COMMODITIES AND THEIR PERCENTAGE SHARES IN TOTAL EXPORT EARNINGS AND TOTAL PRIMARY COMMODITES EXPORT EARNINGS, AVERAGE OVER 1970-1975
(Thousand US dollars)

Commodity / Country	Total Export Earnings	Total Primary Commodity Export[a]	Raw Sugar		Spices		Tobacco, unmanufactured		Oil Seeds Oil Nuts, etc.		Rubber		Wood Rough, Wood Shaped[c]		Palm Oil		Coconut (Copra) Oil		Tin[d]		Total Export Earnings of Selected Commodities	
			Value Export	%	Value Export	%	Value Export	%	Value Export	%	Value Export	%	Value Export	%	Value Export	%	Value Export	%	Value Export	%		
Indonesia	3,628,643	1,278,809	-	-	28,118	0.78 (2.20)	24,478	0.68 (1.91)	19,925	0.55 (1.56)	313,068	8.63 (24.48)	384,187	10.59 (30.04)	83,344	2.30 (6.52)	-	-	93,762	2.58 (7.33)	946,882	26.10 (74.04)
Malaysia	2,647,674	2,084,034	-	-	31,163	1.18 (1.50)	-	-	7,737	0.29 (0.37)	763,315	28.83 (36.63)	435,172	16.44 (20.88)	255,387	9.65 (12.26)	17,788	0.67 (0.85)	408,283	15.42 (19.59)	1,918,845	72.47 (92.07)
Philippines	1,670,196	1,437,581	374,220	22.41 (26.03)	-	-	22,436	1.34 (1.56)	130,411[b]	7.81 (9.07)	-	-	237,935	14.25 (16.55)	-	-	174,836	10.47 (12.16)	-	-	939,838	56.27 (65.38)
Singapore	3,393,517	1,009,545	-	-	52,372	1.54 (5.19)	-	-	6,627	0.20 (0.66)	509,084	15.00 (50.43)	-	-	56,940	1.68 (5.64)	13,498	0.40 (1.34)	7,240	0.21 (0.72)	645,761	19.03 (63.97)
Thailand	1,501,630	1,197,263	96,406	6.42 (8.05)	895	0.06 (0.08)	16,674	1.11 (1.39)	16,734	1.11 (1.40)	155,270	10.34 (12.97)	23,925	1.59 (2.00)	-	-	-	-	99,652	6.64 (8.32)	409,556	27.27 (34.21)

[a] Total primary commodities exports consist of the commodities classified under SITC 0, 1, 2, 4 and 68.
[b] Only SITC 2212, Copra (excluding flour and meal).
[c] The summation of SITC 242 and SITC 243.
[d] Includes SITC 2836 and SITC 6871.

Note: Figures in the parentheses represent the percentage shares of each commodity in total primary commodities exports.

Source: Computed from UN Yearbook of International Trade Statistics, various issues.

earnings of selected primary commodities and their percentage shares in total export earnings and total primary commodity export earnings for each member country by averaging over the period of 1970-1975. Malaysia's total export earnings of selected commodities are accounted for 72.47 percent and 92.07 percent of the total export earnings and the total primary commodity export earnings respectively. The Philippines' total export earnings of selected commodities are accounted for 56.27 and 65.38 percent of the total export earnings and the total primary commodity export earnings respectively. The percentage shares of the total selected commodities' export earnings in total export earnings of Indonesia, Singapore and Thailand are only 26.10, 19.03 and 27.27 percent respectively. In the case of Indonesia, this low figure is due to the exclusion of mineral fuels (SITC 3) from the commodity selection. It can be seen that the percentage share of earnings in total selected commodities rises up to be 74.04 percent of Indonesia's total primary commodities' export earnings since the mineral fuels are excluded from both export earnings. For Singapore, the percentage share of earnings in total selected commodities is raised to 63.97 percent of total primary commodities' export earnings. This indicates the high percentage share of earnings of total selected commodities in that of total primary commodities of which in turn is the small component in the total export. Unlike Indonesia and Singapore, Thailand's percentage share of earnings in total selected commodities is low compared with total export earnings (i.e. 27.27 percent) and there

is not much increase when compared with its total primary commodities' earnings (i.e. 34.21 percent, see Table 4.1), even though the primary commodities are the major components in its total exports. This is as a result of excluding tapioca products and maize from Thailand's selected primary commodities since there are no other ASEAN countries exporting these two commodities which is one of the commodity selection criteria.

From the country and commodity coverages, we can see that the selected commodities are significant for the compensatory financing scheme to alleviate the instability of ASEAN primary commodities exports.

2. Variants of Compensatory Financing Scheme for ASEAN

This study proposes the compensatory financing scheme for ASEAN to mitigate the fluctuations in export earnings of the primary commodities only, not the total export earnings. Two alternative variants of the compensatory financing scheme will be examined, they are :

a) Commodity Basket Variant

This variant is aiming at stabilizing the aggregated exports of a group of selected commodities. This approach simply concerns with mitigating the consequential damages on the macro economies

of the instability in the sum of exports of selected primary commodities. It is certain that a stable flow of exports of the selected commodities taken together may conceal fluctuations of individual commodities and leave their adverse effects out of consideration. It is an appropriate approach for the study in macro level and the drawings of a particular country from the Fund tend to be less if there is offsetting effects among different commodities of that country. Apart from the possible offsetting effects among different commodities of each country, it is also possible for offsetting effects among the aggregated exports of selected commodities among different countries, and hence less funds are needed for the commodity basket variant in the compensatory financing scheme for ASEAN. For the commodity basket variant, each country's compensation and drawing will be calculated from the following formula :

$$(2) \qquad f_{ct} = [\, X_{ct} - (1 \pm K)\, \hat{X}_{ct} \,],\ (1 + K)\, \hat{X}_{ct} \quad \text{if} \quad X_{ct} > \hat{X}_{ct}$$

$$\text{and } (1 - K)\, \hat{X}_{ct} \quad \text{if} \quad X_{ct} < \hat{X}_{ct}$$

where, f_{ct} = the amount of drawing if f_{ct} is negative sign and the amount of repayment if f_{ct} is positive sign,

X_{ct} = actual aggregated export earnings of selected commodities of country c in year t,

$\hat{X}_{ct}$ = the estimate of aggregated export earnings of selected commodities of country c in year t on the medium-term trend,

K = the given percentage of the estimated trend value of which are the reference level for compensation or drawing and repayment. The export earnings which is in between the K percent above and below the trend will not be compensated or repaid. Hereafter is referred to as "the trigger threshold",

t = the time period varies from 1, 2, ..., T,

c = the country subscription varies from 1, 2, ..., 5 (i.e. member countries of ASEAN).

Hence, the total fund needed in year t of the commodity basket variant in the compensatory financing scheme for ASEAN can be calculated from the following formula:

$$(3) \qquad F_t = \sum_{c=1}^{5} f_{ct}$$

where, F_t = net fund needed in year t of the commodity basket variant in the compensatory financing scheme for ASEAN.

It is interesting to find an indicator for offsetting effects both among different commodities of a given country and that among the aggregated commodities of the different countries. The correlation coefficient can serves our objective and will be calculated by the following formula :

$$(4) \qquad S_{ij} = \frac{1}{T-1} \sum_{t=1}^{T} \left(\frac{e_{it}}{\sigma_i}\right)\left(\frac{e_{jt}}{\sigma_j}\right)$$

where, S_{ij} = the correlation coefficient of export earnings of commodity i and commodity j of a given country,

$e_{it} = (X_{it} - \hat{X}_{it})$ = the fluctuation of export earnings of commodity i (X_{it}) from the trend value ($\hat{X}_{it}$) at year t,

$e_{jt} = (X_{jt} - \hat{X}_{jt})$ = the fluctuation of export earnings of commodity j (X_{jt}) from the trend value ($\hat{X}_{jt}$) at year t,

σ_i, σ_j = the standard deviation from trend of the export earnings of commodity i and j respectively.

S_{ij} will be negative and positive value if there is offsetting and reinforcing of export earnings of commodities i and j respectively. For each country, the correlations coefficients will be calculated for all possible pairs of selected commodities of which it will indicate the presence of the automatic stabilizer and destabilizer within a country. The same formula will be employed for calculating the correlation among member countries' aggregated export earnings of selected commodities indicating the offsetting and reinforcing effects among member countries.

b) Individual Commodity Variant

This type of variant is the same as the individual commodity agreement mainly concerning with the sectoral aspect of the primary commodity problems caused by several disruptions to individual industries. There are two folds of pooling financial resource in this individual commodity variant. Firstly, the financial resource will be pooled among exporting countries of ASEAN within a given commodity if there is an offsetting effect in export earnings of that particular commodity among exporting countries. Secondly, the financial resources will be pooled among different individual commodity agreements, if the movements of amount of fund needed for compensation and repayments among different individual commodity agreements are in the opposite directions. If these two-fold effects are present, the fund needed for the compensatory financing scheme of the individual commodity variant will be less.

The compensation and drawings of each country in an individual commodity agreement will be calculated from equation (2). The net fund needed for each individual commodity agreement will be calculated by applying equation (3). Finally, the net funds needed for the compensatory financing scheme in the case of the individual commodity variant is simply the sum of individual commodity cases. An interesting question is whether the fund needed in the individual commodity variant is larger or smaller than in the commodity basket variant.

This depends on the offsetting and reinforcing effects among countries in a given commodity agreement and also among the commodity agreements which can be known from the value of correlation by applying equation (4). And the absolute amounts of net funds needed of these two variants will be compared.

It would also be interesting to determine whether these two variants, which are partial in the sense that they do not cover all export commodities, will stabilize and increase the export earnings from all exports. We can examine this question by comparing the sum of stabilized earnings of selected commodities and the earnings of unselected commodities with the total export earnings of all commodities when there is no stabilization. The above comparison concerns with the level of total export earnings before and after stabilization. The effects of stabilization can also be examined by comparing the instability indices of total export earnings with no stabilization and those after stabilization. This latter comparison concern with the stability of export earnings. These two comparisons will be made for both variants and the cross-variant comparisons will be made as well.

3. Target Level

Compensatory financing scheme aims at compensating countries for deviations of earnings from their trend value. They, therefore, contain an estimate of this trend value, which can be called their

"target" or "target earnings". It is important that this target be an unbiased estimate of the trend value of earnings. The estimates of a medium-term trend which reflects more sensitively the current developments of export earnings are widely accepted in many analyses of compensation financing schemes as well as in our study. Jos de Vries has discussed about various estimates of medium-term trend in many aspects, especially the property of unbiasedness.[1] Vries concluded that the target earnings of STABEX which is calculated by taking the average of earnings over the past four years leads to a full stabilization of earnings only if they show no growth at all in the long run. The target of the IMF compensatory financing facility which is determined as the five-year moving average of the earnings centered on the shortfall year gives an unbiased estimate of the trend value of earnings if earnings increase by a constant absolute amount. If, instead, earnings grow at a constant rate, an unbiased estimate of the trend value of earnings can be arrived at by taking a five-year moving geometric average of earnings centered on the shortfall year. Vries also found out that commodity earnings have tended to increase by constant absolute amounts in the past (up to 1973, at least). Hence, an IMF-type target contributes most to stabilize commodity earnings.

Since the IMF-type target, which is used in this study requires forecasts for export earnings for the two years following the

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[1]Jos de Vries, op.cit., pp. 7-19.

shortfall year, the following assumptions have to be made. First, perfect forecast was assumed since actual trade data are used. Second, these forecasts will be unbiased estimates of actual future developments. Third, the operations of the compensatory financing schemes do not directly affect the export earnings patterns of the member countries.

4. Trigger Threshold

The compensatory financing scheme in this study does not require the full compensation or repayment by the amount of deviation from the target earnings. Instead, only the earnings less than the target level by a significantly large amount would be made eligible for compensation. This reference level for compensation and repayment can be called "trigger threshold". The trigger thresholds of the compensatory financing scheme in this study are arbitrarily chosen at 5, 7.5 and 10 percent of the estimated trend values above and below the trend values. The purposes of having various trigger thresholds are for the discussion on its appropriateness in the sense that to what extent export earnings must be smoothed out for their fluctuations to be acceptable[2] and how the various trigger thresholds influence the effectiveness of the compensatory financing scheme.

[2]Average level of fluctuations of the manufactured products of the developed countries can be used as the magnitude of acceptable fluctuations.

5. Term and Condition of Compensation

The earnings shortfalls will be compensated based on nominal f.o.b. values of exports rather than the real incomes. Since to base compensations on real incomes still commands much discussions not only on the practical grounds but also on the justifications of the idea itself.

The scheme for ASEAN in this study will compensate the earnings shortfalls of member countries in terms of loans rather than grants. Compensation in terms of grants is not desirable mainly on the efficiency grounds for the compensatory financing scheme. First, compensation in terms of grants is another form of subsidy to the industries may induce the deliberate creation of fluctuation. Second, the compensatory grants tend to distort the income and probably lead to resource misallocation between the profitable productions and the unprofitable productions. Finally, compensation in terms of loans which requires repayment in the year of surplus suits the objective of compensatory financing scheme in smoothing out the flow of export earnings to the trend values.

Another feature of compensation condition is that the earnings shortfalls will be fully compensated after deducting by a certain amount which equals the trigger threshold.

6. Repayment System

Repayments are required whenever the export earnings rise above the target. Similar to the compensation condition, repayment equals the excess of surplus over the given trigger threshold. This symmetrical system of compensation and repayment is preferable as it would balance the reductions in shortfalls and surpluses. Provided that the target is a good estimate of the trend value and that fluctuations are normally distributed, the shortfalls and surpluses would balance within 3 to 5 years.[3] However, in actual operation, this may not always be the case. In our study, we introduce the free repayment system in the sense that the surpluses of member countries must be paid to the Fund eventhough their compensatory loans were paid up in the past. On the other hand, the countries must be compensated whenever they have earnings shortfalls eventhough their previous compensatory loans have not been paid up. In other words, the repayment system in this study requires no fixed periods of repayment. The reasons for the free installment periods in repayment are that, firstly, the fixed installmental periods such as five annual installments may enhance the higher fluctuations in the country's export earnings if that country is confronted with the shortfalls during the installmental periods since that country is obliged to pay back its

[3]Rhomberg M. Fleming and L. Boissonneault, "Export Norms and Their Role in Compensatory Financing," IMF Staff Papers, Vol. 10 (March 1963), pp. 97-149.

previous compensatory loans. If this is the case, the effectiveness of the compensatory financing scheme will be lessened. Secondly, the free repayment system also follows the idea of pooling financial resources among member countries. However, this repayment system may also induce deliberate creation of fluctuations but in the long run these deliberately created fluctuations will affect the target and hence the country will be contronted with less opportunity for compensation.

7. Measures of Costs and Benefits

The various variants of the compensatory financing scheme for ASEAN will be simulated assuming they had been in operation during the period of 1962-1975. On the basis of these simulations, conclusions will be drawn concerning the relative costs and benefits of alternative variants (see Table 4.2) and their country distributions in the case of commodity basket variants. The commodity distribution and country distribution of benefits and costs will be examined in the case of the individual commodity variant. Some measures of costs and benefits have to be defined to evaluate the significance of various variants of compensatory financing scheme. Morrison and Perez introduced three measures of costs and benefits as follows :[4]

a) Average Annual Drawings or Compensations

This is probably the most appropriate measures of benefits which show the available financing generated by the compensatory

[4]Thomas K. Morrison and Lorenzo Perez, op.cit., pp. 688.

TABLE 4.2

SIMULATED VARIANTS OF THE COMPENSATORY FINANCING SCHEME FOR ASEAN, ASSUMING IT HAD BEEN IN OPERATION DURING 1962-1975

Variant Number	Type of Variant	Trigger Threshold (%)
1	Commodity Basket Variant	5.0
2	Commodity Basket Variant	7.5
3	Commodity Basket Variant	10.0
4	Individual Commodity Variant	5.0
5	Individual Commodity Variant	7.5
6	Individual Commodity Variant	10.0

financing scheme.

b) Average Annual Net Cash Flow

This measure is simply defined by the drawings minus repayments. This measure may not accurately reflect benefits in the sense that if a country had repaid all loans by the end of the certain period, its average annual net cash flow would be zero. However, for the idea of pooling financial resources among member countries, it can, more or less, reflect the status of each member country to the extent that what country is the net supplier and what country is the net user of the financial resources pooling in the scheme.

c) Average Annual Outstanding Balance

This measure shows to what extent funds were tied up in a particular country and is probably a better indicator of benefits than the average annual net cash flow.

8. Data Collection

The data used in simulations of the compensatory financing scheme are the same as those used in identifying sources of instability. In the simulations, we consider tin concentrates (SITC 2836) and tin alloys (SITC 6871) as only one commodity since some member countries, for instance, Thailand exported only tin concentrates up to 1964 and exported only tin alloys since 1968.

The simulations are based on the historical annual data for the period 1962-1975, therefore, the compensation and repayment system started operating in 1964 and ending in 1973 as the result of fewer estimates of trend values in using five-year moving average technique.

D. Empirical Results

The simulated results of the compensatory financing scheme for selected primary commodities of ASEAN are analysed on the amount of fund needed, the influential effects of various trigger thresholds and the distributions of costs and benefits among countries and commodities. We try to make comparison between the commodity basket variant and the individual commodity variant in the analyses of those consequential aspects of the compensatory financing scheme for ASEAN. The empirical results are presented in four subsections. Section 1 presents the estimated costs and benefits of various variants of the compensatory financing scheme. These estimates are for the compensatory financing scheme without taking the financial resource pooling into consideration. The results of the estimated costs and benefits with resource pooling will be separately presented in another subsection. In subsection 2, the distributions of benefits are presented. The estimated costs and benefits with resource pooling are shown in subsection 3. Finally, the stabilizing effects on both the export earnings level and the export earnings stability are presented in subsection 4.

1. Estimated Costs and Benefits

The simulated results of various variants in the compensatory financing scheme for ASEAN countries are presented in Table 4.3. Without considering the resource pooling, the average annual drawing, average annual net cash flow and the average annual outstanding balance of the commodity basket variant with 5 percent for the trigger threshold (variant No. 1) are equal to 222.8, 139.5 and 522 million US dollars respectively. In other words, for the commodity basket variant, variant No. 1, ASEAN countries on the average draw 222.8 million US dollars in each year, and leave 139.5 million US dollars unpaid each year resulting in 522 million US dollars being tied up in ASEAN countries in each year. It should be noticed that the average annual outstanding balance of variant No. 1 can be up to the maximum of 1774.6 million US dollars in 1972. Since the export earnings of every ASEAN country rose rapidly in 1973, 1974 and 1975, therefore, the estimated target earnings for 1972 by the five-year moving average technique is much higher than the actual export earnings in 1972.

For the individual commodity variant, variant No. 4, the average annual drawing, average annual net cash flow and the average annual outstanding balance are 291.5, 133.5 and 512.2 million US dollars respectively. Furthermore, the average annual outstanding balance of the individual commodity variant with 5 percent for the trigger threshold (variant No. 4) can rise up to the maximum of 1791.7 million US dollars in 1972.

TABLE 4.3

THE ESTIMATED COSTS AND BENEFITS OF VARIOUS VARIANTS OF THE COMPENSATORY FINANCING SCHEME FOR ASEAN, WITHOUT POOLING THE FINANCIAL RESOURCE, 1962-1975
(Thousand US dollars)

Variant Number	Type of Variant	Trigger Threshold (%)	Average Annual Drawings	Average Annual Net Cash Flow	Average Annual Outstanding Balance	Maximum Annual Outstanding Balance
1	Commodity Basket	5.0	222,894	139,504	522,038	1,774,642 (1972)
2	Commodity Basket	7.5	190,072	127,649	448,959	1,562,410 (1972)
3	Commodity Basket	10.0	161,565	116,110	384,424	1,353,360 (1972)
4	Individual Commodity	5.0	291,568	133,558	512,237	1,791,795 (1972)
5	Individual Commodity	7.5	255,365	120,006	458,019	1,617,502 (1972)
6	Individual Commodity	10.0	221,276	102,190	386,287	1,400,966 (1972)

Note: Figures in the parentheses are the years in which the annual outstanding balance are the highest.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

In comparing the estimated costs and benefits between those of the commodity basket variants (variant Nos. 1, 2 and 3) and those of the individual commodity variants (variant Nos. 4, 5 and 6), the average annual drawings, the average annual outstanding balances and the maximum annual outstanding balances of the commodity basket variants, on the average, are less than those of the individual commodity variants (see Table 4.3). In contrast, the average annual net cash flow of the commodity basket variants are higher than those of the individual commodity variants. These results from the above comparison are very interesting. Firstly, it indicates that the individual commodity variant seems to be more beneficial than the commodity basket variant in solving the instability problems of commodities, since ASEAN countries can obtain greater average annual drawing from the former variant than those from the latter. This may be that the individual commodity variant takes into consideration the serious disruptions in individual commodities while the commodity basket variant considers only the commodities as a group concealing the problems of individual commodities. However, we cannot definitely make such a conclusion since the individual commodity variant also requires more fund and this information is not enough for us to make any decision about the best variant for ASEAN countries. Secondly, the findings indicate the cancelling-off effects among different commodities in each country, since the cancelling-off effects of different commodities smooth out the fluctuations of the export,

earnings of the commodities as a group and hence the less average annual drawing is required. These cancelling-off effects among different commodities are confirmed by some negative correlation coefficients of different commodities in each country presented in Tables B.2, B.3, B.4, B.5 and B.6 in appendix B.

The impacts of changing the trigger threshold percentage can be seen by comparing the figures of variants No. 1, No. 2 and No. 3 for the commodity basket variants and comparing the figures of variants No. 4, No. 5 and No. 6 for the individual commodity variants. A 2.5 percent increase of the trigger threshold bring about some 13 percent decrease in each cost item.

2. Distribution of Costs and Benefits

One of the major concerns about the costs and benefits of the compensatory financing schemes for ASEAN is that for commodity and country distributions of the benefits. Among the estimates of costs and benefits, the average annual net cash flow may not precisely reflect the direct benefits, because it is, by definition, reduced in proportion to the amount repaid by a recipient country during the simulated period and can be zero. Thus, we mainly employ the average annual drawing which shows the available financing generated by the scheme and the average annual outstanding balance which indicates the extent to which funds are tied up in a particular country or commodity.

Since the commodity basket variant is for the commodities as a group, only country distribution can be examined. For the individual commodity variant, we can examine the country distribution, the commodity distribution as well as the country distribution within each commodity.

a) Country Distribution of the Benefits

Country distribution of the benefits generated by the commodity basket variants are presented in Tables 4.4, 4.5 and 4.6 for the 5, 7.5 and 10 percent of the trigger thresholds respectively. Tables 4.8, 4.9 and 4.10 present the country distribution of benefits of which the trigger threshold percentages are 5, 7.5 and 10 percent respectively.

For the commodity basket variant with 5 percent trigger threshold (variant No. 1), Malaysia, Indonesia and Singapore receive 33.30, 29.90 and 17.19 percent of the total average annual drawings respectively, leaving 12.97 and 6.64 percent for Philippines and Thailand respectively. Comparing with the export shares of ASEAN countries in selected commodities as a group in Table 4.7 the distribution of benefits conforms with the countries' export shares, with the exception of Singapore and Philippines which are in reverse order. Philippines accounted for 19.33 percent which is greater than 13.28 percent of Singapore in the export shares presented in Table 4.7. This may be the higher level of instability in total

TABLE 4.4

COUNTRY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE COMMODITY BASKET VARIANT, VARIANT NO. 1 1962-1975*
(Thousand US dollars)

Country	Average Annual Drawing	Average Annual Net Cash Flow	Average Annual Outstanding Balance
Indonesia	66,643 (29.90)	30,995 (22.22)	186,708 (35.76)
Malaysia	74,226 (33.30)	47,379 (33.96)	135,353 (25.93)
Philippines	28,914 (12.97)	27,941 (20.03)	70,357 (13.48)
Singapore	38,318 (17.19)	20,089 (14.40)	100,809 (19.31)
Thailand	14,793 (6.64)	13,100 (9.39)	28,811 (5.52)
Total	222,894 (100.0)	139,504 (100.0)	522,038 (100.0)

*For specification of variant, see Table 4.2.

Note: Figures in the parentheses are the percentage of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.5

COUNTRY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE COMMODITY BASKET VARIANT, VARIANT NO. 2
1962-1975*
(Thousand US dollar)

Country	Average Annual Drawing	Average Annual Net Cash Flow	Average Annual Outstanding Balance
Indonesia	59,816 (31.47)	29,182 (22.86)	173,928 (38.74)
Malaysia	60,666 (31.92)	44,192 (34.62)	110,762 (24.67)
Philippines	25,261 (13.29)	25,261 (19.79)	62,575 (13.94)
Singapore	32,014 (16.84)	17,626 (13.81)	78,160 (17.41)
Thailand	12,315 (6.48)	11,388 (8.92)	23,534 (5.24)
Total	190,072 (100.0)	127,649 (100.0)	448,959 (100.0)

*For specification of variant, see Table 4.2.

Note: Figures in the parentheses are the percentage of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.6

COUNTRY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE COMMODITY BASKET VARIANT, VARIANT NO. 3
1962-1975*
(Thousand US dollars)

Country	Average Annual Drawing	Average Annual Net Cash Flow	Average Annual Outstanding Balance
Indonesia	52,989 (32.80)	27,368 (23.57)	161,148 (41.92)
Malaysia	49,753 (30.79)	41,262 (35.54)	91,436 (23.78)
Philippines	21,608 (13.37)	21,608 (18.61)	50,901 (13.24)
Singapore	26,553 (16.44)	15,603 (13.44)	58,954 (15.34)
Thailand	10,662 (6.60)	10,269 (8.84)	21,985 (5.72)
Total	161,565 (100.0)	116,110 (100.0)	384,424 (100.0)

*For specification of variant, see Table 4.2.

Note: Figures in the parentheses are the percentage of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

selected commodities of Singapore than that of the Philippines (see Table 4.7) outweighting the export shares and hence receiving the greater average annual drawings for Singapore. But these outweighting effects between the export share and the level of instability do not appear in the cases of other countries, since the difference of export shares are quite large such as the case of Malaysia and Singapore, Malaysia and Indonesia, and Philippines and Thailand. The rankings of the beneficiary countries are the same when the trigger threshold changes from 5 percent to 7.5 percent, but the shares of benefits for Indonesia and Philippines become greater whereas those of Malaysia and Singapore become less and that of Thailand is rather constant. The country distribution of benefits is changed when the trigger threshold percentage increases to 10 percent that is Indonesia is the largest beneficiary country, leaving Malaysia be the second. This also can be explained by the net effects of the shares in exports and the levels of instability, since the bigger the trigger threshold percentage, the less compensation the country with low instability will receive because of the less influence of export share relative to the smaller export share but with high instability.

The country ranking in the average outstanding balances of the commodity basket variants are the same as the average annual drawing comparing to the country share of export, with the exception of Indonesia which has the highest average annual outstanding balance (see Tables 4.4, 4.5 and 4.6).

TABLE 4.7

THE INSTABILITY INDICES OF EXPORT EARNINGS OF TOTAL SELECTED COMMODITIES IN ASEAN COUNTRIES AND THE COUNTRIES' SHARES OF SELECTED COMMODITIES, 1962-1975

Country	Instability Index[a] (%)	Export Share[b] (Thousand US dollars)
Indonesia	27.79	946,884 (19.48)
Malaysia	11.86	1,918,846 (39.48)
Philippines	6.28	939,831 (19.33)
Singapore	15.41	645,763 (13.28)
Thailand	8.77	409,558 (8.43)
Total	-	4,860,882 (100.0)

[a]Instability index is calculated from the percentage deviations from five-year moving average trend.
[b]Averaging over 1970-1975.

Note: The figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

However, a 2.5 percent change of the trigger threshold causes a change of only 1 percent in the country distribution of benefits (in percentage share of benefits) and some 8 percent change in the absolute value of benefits (see Tables 4.4, 4.5 and 4.6).

In the cases of the individual commodity variants, the absolute values of benefits both in terms of the average annual drawings and the average annual outstanding balance are greater than those of the commodity basket variants for the same trigger threshold percentage (see Tables 4.8, 4.9 and 4.10). The ranking of beneficiary countries from high to low is different from that of the commodity basket variant, especially in the case of the ten-percent trigger threshold. Malaysia, Indonesia, Philippines, Singapore and Thailand receive 32.78, 26.09, 17.37, 15.29 and 8.47 percent of the total average annual outstanding balance for variant No. 4 (see Table 4.8). The country distribution of benefits in the individual commodity variants are more conformed to the country relative share of exports than that of the commodity basket variants in terms of average annual drawings (see Tables 4.7, 4.8, 4.9 and 4.10). Moreover, the ranking of the beneficiary countries does not change due to the changes in trigger threshold percentages, eventhough the shares of benefits of Indonesia, Philippines, Malaysia and Singapore have the same movements as in the commodity basket variants (see Tables 4.8, 4.9 and 4.10). These may due to the individual commodity variants direct towards the

TABLE 4.8

COUNTRY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 4 1962-1975*
(Thousand US dollars)

Country	Average Annual Drawing	Average Annual Net Cash Flow	Average Annual Outstanding Balance
Indonesia	76,059 (26.09)	30,401 (22.76)	186,335 (36.38)
Malaysia	95,568 (32.78)	40,328 (30.20)	126,842 (24.76)
Philippines	50,661 (17.37)	30,863 (23.11)	64,303 (12.55)
Singapore	44,576 (15.29)	19,260 (14.42)	102,840 (20.08)
Thailand	24,704 (8.47)	12,706 (9.51)	31,917 (6.23)
Total	291,568 (100.0)	133,558 (100.0)	512,237 (100.0)

*For specification of variant, see Table 4.2.

Note: Figures in the parentheses are the percentage of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.9

COUNTRY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 5 1962-1975*
(Thousand US dollars)

Country	Average Annual Drawing	Average Annual Net Cash Flow	Average Annual Outstanding Balance
Indonesia	69,821 (27.34)	28,158 (23.47)	172,224 (37.60)
Malaysia	81,317 (31.84)	34,588 (28.82)	106,310 (23.21)
Philippines	48,970 (17.22)	29,428 (24.52)	69,803 (15.24)
Singapore	38,289 (15.00)	16,419 (13.68)	81,040 (17.70)
Thailand	21,968 (8.60)	11,413 (9.51)	28,642 (6.25)
Total	255,365 (100.0)	120,006 (100.0)	458,019 (100.0)

*For specification of variant, see Table 4.2.

Note: Figures in the parentheses are the percentage of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.10

COUNTRY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 6 1962-1975*
(Thousand US dollars)

Country	Average Annual Drawing	Average Annual Net Cash Flow	Average Annual Outstanding Balance
Indonesia	63,605 (28.74)	25,021 (24.48)	157,839 (40.86)
Malaysia	67,884 (30.68)	26,728 (26.16)	79,146 (20.49)
Philippines	38,214 (17.27)	26,897 (26.32)	66,591 (17.24)
Singapore	32,167 (14.54)	13,653 (13,36)	59,581 (15.42)
Thailand	19,406 (8.77)	9,891 (9.68)	23,130 (5.99)
Total	221,276 (100.0)	102,190 (100.0)	386,287 (100.0)

*For specification of variant, see Table 4.2.

Note: Figures in the parentheses are the percentage of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

individual commodities' fluctuations which is more accurate in measuring the fluctuations of the commodities than that just considers the commodities as a group as the commodity variants do.

b) Commodity Distribution of Benefits

Tables 4.11, 4.12 and 4.13 present the commodity distribution of benefits generated by the individual commodity variants with 5, 7.5 and 10 percent of the trigger thresholds (variants No. 4, No. 5 and No. 6) respectively. Since the impacts of changing the trigger threshold percentage on the distribution of benefits are very small (comparing variants No. 4, No. 5 and No. 6 in Tables 4.11, 4.12 and 4.13 respectively), we will examine the distribution of benefits generated by the individual commodity variant with the five-percent trigger threshold (variant No. 4 in Table 4.11). In Table 4.11, the most benefitted commodity is natural rubber which accounts for 42.53 percent of the annual drawings and 47.76 percent of the average annual outstanding balance comparing with its export share of 35.81 percent of the total selected commodity exports for ASEAN. The five largest beneficiaries together receive 88.33 percent of the average annual drawings and 89.23 percent of the average annual outstanding balance comparing with their export shares taken together accounted for 88.4 percent of the total selected commodities. These five largest beneficiaries are natural rubber (SITC 2311), wood rough and wood shaped (SITC 24), raw sugar (SITC 0611), palm oil (SITC 4222),

TABLE 4.11

COMMODITY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 4 1962-1975[a]
(Thousand US dollars)

SITC	Commodity	Average Annual Drawing	Average Annual Outstanding Balance	Export Share[d]
0611	Raw Sugar	35,109 (12.04)	54,207 (10.58)	470,626 (9.68)
075	Spices	5,212 (1.79)	12,100 (2.36)	112,548 (2.32)
121	Tobacco, unmanufactured	3,912 (1.34)	4,492 (0.88)	63,588 (1.31)
221	Oil Seeds, Oil Nuts and Oil Kernels	9,477 (3.25)	16,201 (3.16)	181,434 (3.73)
2311	Natural Rubber	123,997 (42.53)	244,660 (47.76)	1,740,737 (35.81)
24	Wood, Lumber and Cork[b]	46,473 (15.94)	79,940 (15.61)	1,081,219 (22.24)
4222	Palm Oil	26,777 (9.18)	49,247 (9.62)	395,671 (8.14)
4223	Coconut Oil	15,420 (5.29)	22,382 (4.37)	206,122 (4.24)
6871	Tin[c]	25,191 (8.64)	29,008 (5.66)	608,937 (12.53)
	Total	291,568 (100.0)	512,237 (100.0)	4,860,882 (100.0)

[a]For specification of variant, see Table 4.2.
[b]Only wood rough (SITC 242) and wood shaped (SITC 243).
[c]Includes tin ores and concentrates (SITC 2836) and tin alloys, unwrought (SITC 6871)
[d]Averaging over the period of 1970-1975

Note: Figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.12

COMMODITY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 5 1962-1975[a]
(Thousand US dollars)

SITC	Commodity	Average Annual Drawing		Average Annual Outstanding Balance	
0611	Raw Sugar	31,793	(12.45)	52,256	(11.41)
075	Spices	4,370	(1.71)	9,966	(2.18)
121	Tobacco, unmanufactured	3,452	(1.35)	4,270	(0.93)
221	Oil Seeds, Oil Nuts and Oil Kernels	8,034	(3.15)	15,818	(3.45)
2311	Natural Rubber	109,153	(42.74)	209,223	(45.68)
24	Wood, Lumber and Cork[b]	40,371	(15.81)	69,848	(15.25)
4222	Palm Oil	24,105	(9.44)	45,484	(9.93)
4223	Coconut Oil	13,871	(5.43)	23,950	(5.23)
6871	Tin[c]	20,216	(7.92)	27,204	(5.94)
	Total	255,365	(100.0)	458,019	(100.0)

[a]For specification of variant, see Table 4.2.
[b]Only wood rough (SITC 242) and wood shaped (SITC 243).
[c]Includes tin ores and concentrates (SITC 2836) and tin alloys, unwrought (SITC 6871).

Note: Figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.13

COMMODITY DISTRIBUTION OF BENEFITS AND COSTS GENERATED BY THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 6 1962-1975[a]
(Thousand US dollars)

SITC	Commodity	Average Annual Drawing		Average Annual Outstanding Balance	
0611	Raw Sugar	28,669	(12.96)	50,002	(12.94)
075	Spices	3,716	(1.68)	8,655	(2.24)
121	Tobacco, unmanufactured	3,038	(1.37)	4,189	(1.08)
221	Oil Seeds, Oil Nuts and Oil Kernels	6,691	(3.02)	12,722	(3.29)
2311	Natural Rubber	94,308	(42.62)	164,867	(42.68)
24	Wood, Lumber and Cork[b]	35,252	(15.93)	60,514	(15.67)
4222	Palm Oil	21,546	(9.74)	41,282	(10.69)
4223	Coconut Oil	12,411	(5.61)	22,791	(5.90)
6871	Tin[c]	15,645	(7.07)	21,265	(5.51)
	Total	221,276	(100.0)	386,287	(100.0)

[a]For specification of variant, see Table 4.2.
[b]Only wood rough (SITC 242) and wood shaped (SITC 243).
[c]Includes tin ores and concentrates (SITC 2836) and tin alloys, unwrought (SITC 6871).

Note: Figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

and tin (SITC 6871). Unlike the country distribution of benefits, the commodity distribution of benefits is, on the average, consistent with the commodities' export shares (see Table 4.11).

c) Country Distribution of Benefits Within Each Commodity

It is also interesting to examine the distribution of benefits among exporting countries in each commodity. The impacts of changing the trigger threshold percentage on the distribution of benefits among countries can be seen by comparing the figures in Tables 4.14, 4.15 and 4.16 which present the distribution of benefits among exporting countries in each commodity with the 5, 7.5 and 10 percent of trigger thresholds respectively. Table 4.17 shows the country share of export in each commodity.

(1) Raw Sugar (SITC 0611)

There are two exporting countries of raw sugar in ASEAN countries namely Philippines and Thailand. The export shares of Philippines and Thailand are 79.52 and 20.48 percent respectively (see Table 4.17). Philippines receives about 73 percent of the average annual drawing of raw sugar, leaving about 27 percent for Thailand. The country distribution of benefits in raw sugar is, rather consistent with the distribution of export shares. Furthermore, a 2.5 percent increase in the trigger threshold percentage induces about 1 percent shift of the average annual drawing from Philippines to Thailand (see

TABLE 4.14

COUNTRY DISTRIBUTION OF BENEFITS WITHIN EACH COMMODITY OF THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 4, 1962-1975[a]
(Thousand US dollars)

SITC	Commodity	Average Annual Drawings					
		Indonesia	Malaysia	Philippines	Singapore	Thailand	Total
0611	Raw Sugar	-	-	25,966 (73.96)	-	9,143 (26.04)	35,109 (100.0)
075	Spices	2,900 (55.64)	1,025 (19.67)	-	1,157 (22.20)	130 (2.49)	5,212 (100.0)
121	Tobacco, unmanufactured	2,724 (69.63)	-	821 (20.99)	-	367 (9.38)	3,912 (100.0)
221	Oil Seeds, Oil Nuts and Oil Kernels	2,940 (31.02)	984 (10.38)	3,903 (41.19)	1,031 (10.88)	619 (6.53)	9,477 (100.0)
2311	Natural Rubber	27,412 (22.11)	48,036 (38.74)	-	38,001 (30.65)	10,548 (8.50)	123,997 (100.0)
24	Wood, Lumber and Cork	21,495 (46.25)	16,565 (35.65)	7,479 (16.09)	-	934 (2.01)	46,473 (100.0)
4222	Palm Oil	7,349 (27.45)	16,415 (61.30)	-	3,013 (11.25)	-	26,777 (100.0)
4223	Coconut Oil	-	2,038 (13.22)	12,492 (81.01)	890 (5.77)	-	15,420 (100.0)
6871	Tin[c]	11,239 (44.62)	10,505 (41.70)	-	484 (1.92)	2,963 (11.76)	25,191 (100.0)

[a]For specification of variant, see Table 4.2.
[b]Only wood rough (SITC 242) and wood shaped (SITC 243).
[c]Includes tin ores and concentrates (SITC 2836) and tin alloys, unwrought (SITC 6871).

Note: Figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.15

COUNTRY DISTRIBUTION OF BENEFITS WITHIN EACH COMMODITY OF THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 5, 1962-1975[a]
(Thousand US dollars)

SITC	Commodity	Average Annual Drawings					
		Indonesia	Malaysia	Philippines	Singapore	Thailand	Total
0611	Raw Sugar	-	-	23,208 (73.00)	-	8,585 (27.00)	31,793 (100.0)
075	Spices	2,737 (62.63)	771 (17.64)	-	744 (17.03)	118 (2.70)	4,370 (100.0)
121	Tobacco, unmanufactured	2,564 (74.28)	-	619 (17.93)	-	269 (7.79)	3,452 (100.0)
221	Oil Seeds, Oil Nuts and Oil Kernels	2,695 (33.54)	869 (10.82)	3,069 (38.20)	916 (11.40)	485 (6.04)	8,034 (100.0)
2311	Natural Rubber	24,913 (22.82)	42,043 (38.52)	-	32,832 (30.08)	9,365 (8.58)	109,153 (100.0)
24	Wood, Lumber and Cork[b]	19,748 (48.92)	14,026 (34.74)	5,829 (14.44)	-	768 (1.90)	40,371 (100.0)
4222	Palm Oil	6,739 (27.96)	14,765 (61.25)	-	2,601 (10.79)	-	24,105 (100.0)
4223	Coconut Oil	-	1,867 (13.46)	11,245 (81.07)	759 (5.47)	-	13,871 (100.0)
6871	Tin[c]	10,425 (51.57)	6,976 (34.51)	-	437 (2.16)	2,378 (11.76)	20,216 (100.0)

[a]For specification of variant, see Table 4.2.
[b]Only wood rough (SITC 242) and wood shaped (SITC 243).
[c]Includes tin ores and concentrates (SITC 2836) and tin alloys, unwrought (SITC 6871).

Note: Figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.16

COUNTRY DISTRIBUTION OF BENEFITS WITHIN EACH COMMODITY OF THE INDIVIDUAL COMMODITY VARIANT, VARIANT NO. 6, 1962-1975[a]
(Thousand US Dollars)

SITC	Commodity	Average Annual Drawings					
		Indonesia	Malaysia	Philippines	Singapore	Thailand	Total
0611	Raw Sugar	-	-	20,642 (72.00)	-	8,027 (28.00)	28,669 (100.0)
075	Spices	2,575 (69.30)	536 (14.42)	-	498 (13.40)	107 (2.88)	3,716 (100.0)
121	Tobacco, unmanufactured	2,404 (79.13)	-	438 (14.42)	-	196 (6.45)	3,038 (100.0)
221	Oil Seeds, Oil Nuts and Oil Kernels	2,469 (36.90)	754 (11.27)	2,300 (34.37)	801 (11.97)	367 (5.49)	6,691 (100.0)
2311	Natural Rubber	22,415 (23.77)	36,049 (38.22)	-	27,662 (29.33)	8,182 (8.68)	94,308 (100.0)
24	Wood, Lumber and Cork[b]	18,003 (51.07)	11,873 (33.68)	4,758 (13.50)	-	618 (1.75)	35,252 (100.0)
4222	Palm Oil	6,129 (28.45)	13,228 (61.39)	-	2,189 (10.16)	-	21,546 (100.0)
4223	Coconut Oil	-	1,707 (13.75)	10,076 (81.19)	628 (5.06)	-	12,411 (100.0)
6871	Tin[c]	9,610 (61.42)	3,737 (23.89)	-	389 (2.49)	1,909 (12.20)	15,645 (100.0)

[a]For specification of variant, see Table 4.2.
[b]Only wood rough (SITC 242) and wood shaped (SITC 243).
[c]Includes tin ores and concentrates (SITC 2836) and tin alloys, unwrought (SITC 6871).

Note: Figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.17

COUNTRY SHARE OF EXPORT IN EACH COMMODITY, AVERAGE OVER 1970-1975
(Thousand US dollars)

SITC	Commodity	Export Earnings					
		Indonesia	Malaysia	Philippines	Singapore	Thailand	Total
0611	Raw Sugar	-	-	374,220 (79.52)	-	96,406 (20.48)	470,626 (100.0)
075	Spices	28,118 (24.98)	31,163 (27.69)	-	52,372 (46.53)	895 (0.80)	112,548 (100.0)
121	Tobacco, unmanufactured	24,478 (38.50)	-	22,436 (35.28)	-	16,674 (26.22)	63,588 (100.0)
221	Oil Seeds, Oil Nuts and Oil Kernels	19,925 (10.98)	7,737 (4.27)	130,411[a] (71.88)	6,627 (3.65)	16,734 (9.22)	181,434 (100.0)
2311	Natural Rubber	313,068 (17.99)	763,315 (43.85)	-	509,084 (29.24)	155,270 (8.92)	1,740,737 (100.0)
24	Wood, Lumber and Cork[b]	384,187 (35.53)	435,172 (40.25)	237,935 (22.01)	-	23,925 (2.21)	1,081,219 (100.0)
4222	Palm Oil	83,344 (21.06)	255,387 (64.55)	-	56.940 (14.39)	-	395,671 (100.0)
4223	Coconut Oil	-	17,788 (8.63)	174,836 (84.82)	13,498 (6.55)	-	206,122 (100.0)
6871	Tin[c]	93,762 (15.40)	408,283 (67.05)	-	7,240 (1.19)	99,652 (16.36)	608,937 (100.0)

[a]Only copra (SITC 2212).
[b]Only wood rough (SITC 242) and wood shaped (SITC 243).
[c]Includes tin ores and concentrates (SITC 2836) and tin alloys, unwrought (SITC 6871).

Note: Figures in the parentheses are the percentages of the total.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.18

EXPORT EARNINGS INSTABILITY INDICES OF THE INDIVIDUAL SELECTED COMMODITIES

SITC	Export Commodity	Exporting Country	Earning Fluctuations (%)
0611	Raw Sugar	Philippines	14.89
		Thailand	45.88
075	Spices	Indonesia	31.13
		Malaysia	12.24
		Singapore	7.70
		Thailand	28.22
121	Tobacco, unmanufactured	Indonesia	32.25
		Philippines	13.09
		Thailand	26.07
221	Oil Seeds, Oil Nuts and Oil Kernels	Indonesia	28.80
		Malaysia	26.57
		Philippines	9.46
		Singapore	34.27
		Thailand	11.54
2311	Natural Rubber	Indonesia	27.24
		Malaysia	16.55
		Singapore	17.98
		Thailand	16.71
24	Wood, Lumber and Cork[a]	Indonesia	35.56
		Malaysia	13.23
		Philippines	14.25
		Thailand	15.99
4222	Palm Oil	Indonesia	31.52
		Malaysia	11.41
		Singapore	16.12
4223	Coconut (Copra) Oil	Malaysia	18.84
		Philippines	19.16
		Singapore	17.59
6871	Tin and Tin Alloys, unwrought[b]	Indonesia	43.43
		Malaysia	9.19
		Singapore	22.94
		Thailand	12.02

[a]Only wood rough (SITC 242) and shaped wood (SITC 243)
[b]Tin ores and tin alloys (i.e. SITC 2836 and SITC 6871 respectively).

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

Tables 4.14, 4.15 and 4.16). This may be the effects of the instability levels outweighting the export shares for the bigger trigger threshold percentage, since the export earnings instability level of Thailand is 45.88 which is much higher than 14.89 of Philippines.

(2) Spices (SITC 075)

There are four exporting countries of spices namely Indonesia, Malaysia, Singapore and Thailand. The ranking of export shares from high to low is Singapore, Malaysia, Indonesia and Thailand of which the export shares are 46.53, 27.69, 24.98 and 0.80 respectively (see Table 4.17). But the ranking of benefited countries is inconsistent with the export shares. Indonesia and Thailand are the largest and smallest beneficiaries respectively for all trigger threshold percentages (see Tables 4.14, 4.15 and 4.16). Singapore and Malaysia are the second and third largest beneficiaries in the five-percent trigger threshold and Malaysia becomes the second largest beneficiary when the trigger threshold percentages become 7.5 and 10 percent. These findings of the impacts of the different trigger threshold percentages can be explained by the outweighting effects between the instability levels and the export shares (see Tables 4.17 and 4.18).

(3) Unmanufactured Tobacco (SITC 121)

Indonesia, Philippines, and Thailand are the exporting countries of unmanufactured tobacco and the export shares are 38.50, 35.28 and 26.22 percent of the ASEAN tobacco export respectively (see Table 4.17). The ranking of the benefited countries are consistent with those of export shares, which Indonesia is the largest beneficiary and Philippines and Thailand are the second and the third respectively (see Tables 4.14, 4.15 and 4.16). However, the benefits in terms of average annual drawings are uneven distributed among those exporting countries in relation to the distribution of export shares. For instance, Indonesia receives some 70 percent of the average annual drawings leaving some 17 percent for Malaysia comparing with the slightly difference in the export shares of the two countries. Moreover, the bigger the trigger threshold percentages, the greater the benefits are distributed to Indonesia and the less to Malaysia and Thailand (see Tables 4.14, 4.15 and 4.16). Again, these findings are the results of outweighting effects between the instability level and the export shares of the exporting countries (see Tables 4.17 and 4.18).

(4) Oil Seeds, Oil Nuts and Oil Kernels (SITC 221)

The Philippines is the major exporting country accounted for 71.88 percent of the ASEAN exports of oil seeds but its export

earnings instability of this commodity is the lowest among exporting countries (see Tables4.17 and 4.18). In the case of Indonesia, its export share is much lower than that of Philippines but its instability level is much higher than that of Philippines. These contradictory results affect the distribution of benefits of these two countries when the different trigger threshold percentages are imposed. With the five-percent and six-percent trigger thresholds, Philippines receives greater average annual drawings than Indonesia but Indonesia becomes 10 percent (see Tables4.14, 4.15 and 4.16). The same situation applies also to Singapore and Thailand.

(5) Natural Rubber (SITC 2311)

The case of natural rubber tends to confirm our explanation about the outweighting effects of the instability level and the export share. Malaysia, Singapore, Indonesia and Thailand have 43.85, 29.24, 17.99 and 8.92 percent of the natural rubber exports of ASEAN and their export instability levels in this commodity are not much different (see Tables 4.17 and 4.18). These lead to the even distribution of benefits in relation to the export shares of the exporting countries and the distribution of benefits is unchanged when there are the changes in the trigger threshold percentages (see Tables 4.14, 4.15 and 4.16).

(6) Wood, Lumber and Cork (SITC 24)

Indonesia, Malaysia and Philippines receive 46.25, 35.65 and 16.09 percent of the average annual drawings respectively leaving only 2.01 percent for Thailand (see Table 4.14). The benefits are distributed more to the countries with large shares in this commodity export and less to the countries with small shares in commodity export. The outweighting effects, again, apply to the cases of Indonesia and Malaysia. Having 40.25 percent of the ASEAN exports in wood, lumber and cork, Malaysia receives 35.65 percent of the average annual drawings whereas Indonesia has 35.53 percent of the ASEAN exports of wood as its export share but receives 46.25 percent of the average annual drawings (see Tables 4.17 and 4.14). Moreover, the bigger the trigger threshold percentage is, the greater the average annual drawings are distributed to Indonesia and the less for Malaysia due to the dominant effects of the instability levels over those of export shares, since instability level in wood export of Indonesia is much higher than that of Malaysia (i.e. 35.36 percent of Indonesia and 13.23 percent of Malaysia, see Table 4.18), while the difference in their export shares is small (i.e. 35.53 percent for Indonesia comparing with 40.25 percent for Malaysia, see Table 4.17).

(7) Palm Oil (SITC 4222)

Malaysia is the largest exporting country in ASEAN accounting for 64.55 percent of total exports of palm oil which is about 3 times

greater than the 21.06 percent of the second largest exporting countries, Indonesia (see Table 4.17). In contrast, Indonesia has higher instability in earnings of palm oil than that of Malaysia (see Table 4.18). The outweighting effect turns out to be in favor of the export shares and hence Malaysia receives 61.30 percent of the average annual drawings leaving 27.45 percent for Indonesia in the five-percent trigger threshold (see Table 4.14). However, the higher instability level of Indonesia affects the distribution of benefits to some extent indicated by a rather high and low benefits distributed to Indonesia and Malaysia respectively, comparing with their export percentage shares.

(8) Coconut (Copra) Oil (SITC 4223)

The Philippines receives 81 percent of the average annual drawings leaving about 13 and 5 percent for Malaysia and Singapore respectively (see Table 4.14). The distribution of benefits among the exporting countries of coconut oil rather conforms with the countries' shares of exports (see Table 4.17 for comparison). Moreover, the impact of changing the trigger threshold percentage on the distribution of benefits is very small (see Tables 4.14, 4.15 and 4.16). These results are due to the slight differencesin the instability levels of coconut oil export earnings among the exporting countries (see Table 4.18).

(9) Tin (SITC 6871)

The compensations for tin are made on the tin ores (SITC 2836) and tin alloys (SITC 6871) taken together. Indonesia and Malaysia receive 44.62 and 41.70 percent of the average annual drawings leaving 11.76 and 1.92 percent for Thailand and Singapore respectively for the five-percent trigger threshold (see Table 4.14). Again, the outweighting effects play its roles in the cases of Indonesia and Malaysia since Indonesia accounts for only 15.40 percent of the ASEAN tin export which is much less than that of Malaysia and even less than that of Thailand (see Table 4.17). But the instability level of Indonesia is much higher than that of Malaysia resulting in the larger benefits to Indonesia than those to Malaysia and Thailand (See Table 4.18). The outweighting effects become clearer when the bigger trigger threshold percentages are imposed. For the ten-percent trigger threshold, Indonesia receives 61.42 percent of the average annual drawings whereas Malaysia receives only 23.89 percent.

3. Offsetting Effects Among Countries and Commodities' Export Earnings and the Resource Pooling

The estimated costs and benefits in subsection 1 already presented are the costs and benefits generated by the compensatory financing schemes without pooling the financial resource among countries and among commodities. For instances, the average annual

drawing of the commodity basket variant is the sum of the average annual drawing of each country's. And those of average annual drawings are estimated separately for each country. In the case of pooling financial resource, the annual drawings and repayments of every country will be summed for each year. If one country, in a particular year, gets compensation but another country, in the same period, pays repayment to the Fund, then the commodity basket variant needs less fund for the operation of the compensatory financing in that period. Furthermore, if the directions of compensation and repayment of ASEAN countries are mostly in the opposite directions, the fund needed for the compensatory financing scheme for ASEAN will be substantially reduced. If there is not any opposite movement of repayments and compensations among ASEAN countries, the estimated costs and benefits will be the same for both the compensatory financing scheme with the resource pooling and that without resource pooling. Therefore, whether the resource pooling can reduce the fund needed for the operation of the compensatory financing scheme for ASEAN is dependent on the existence of the offsetting effects among ASEAN countries' export earnings and among the export earnings of the different commodities of ASEAN. Thus, in this subsection, we try to examine the existence of the offsetting effects in ASEAN exports and their effects on the fund needed for the compensatory financing scheme for ASEAN. Since the average annual net cash flow is defined as the drawings minus repayments and the average annual outstanding balance

is defined as the accumulated annual net cash flow, therefore, the estimates of these two measures are the same for those with and without resource pooling. Only the average annual drawings will be different between the scheme with resource pooling and that without pooling the resource. Hence, we examine only the average annual drawings in this subsection. The average annual drawing with the resource pooling, hereafter, is called "the net average annual drawing". The difference between the average annual drawing and the net average annual drawing is the offsetting effects.

Table 4.19 presents the amounts of the average annual drawings and the net average annual drawings of both the commodity basket variants and the individual commodity variants. The average drawings of the commodity basket variant (without resource pooling) are 222.8, 190.0 and 161.5 million US dollars when the trigger percentages are 5, 7.5 and 10 percent respectively. But the net average annual drawings of the commodity basket variants are 208.3, 179.1 and 153.8 million US dollars respectively. Hence, the offsetting effects or the average annual drawings saved from the operation of pooling resource are 14.5, 10.8 and 7.6 million US dollars when the trigger threshold percentages are 5, 7.5 and 10 percent respectively. Comparing with the average annual drawing and the average outstanding balance of ASEBEX, they are, on the average, only 100 and 160 million US dollars respectively, those in our study require about two times of the ASEBEX. However, these may be due to the different features

TABLE 4.19

AVERAGE ANNUAL DRAWINGS OF THE COMPENSATORY FINANCING SCHEMES WITH AND WITHOUT FINANCIAL RESOURCE POOLING, 1962-1975
(Thousand US dollars)

Variant Number[a]	Type of Variant	Average Annual Drawing[b]	Net Average Annual Drawing[c]	Offsetting Effect
1	Commodity Basket	222,894	208,399	14,585 (6.54)
2	Commodity Basket	190,072	179,199	10,873 (5.72)
3	Commodity Basket	161,565	153,871	7,694 (4.76)
4	Individual Commodity	291,568	215,111	76,457 (26.22)
5	Individual Commodity	255,365	190,502	64,863 (25.40)
6	Individual Commodity	221,276	165,349	55,927 (25.88)

[a]For the specification of variant number, see Table 4.2.
[b]The average annual drawing is the amount money drawn at the absences of financial pooling among countries in the case of commodity basket variants and among both commodities and countries in the case of the individual commodity variants.
[c]The net average annual drawing indicates the amount money drawn at the presence of financial pooling stated in b.

Note: Figures in the parentheses are the offsetting effect as the percentages of the average annual drawing.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

of the two studies namely the commodity coverage, the terms and condition of compensation, the installment period, etc.[5]

Eventhough the offsetting effects in our study are small in relation to the average annual drawing (i.e. 6.54, 5.72 and 4.76 percent of the average annual drawings, see Table 4.19), but they are still sizable. These small amounts of the offsetting effects in the commodity basket variants are confirmed by the correlation coefficients among countries' export earnings of selected commodities as a group which is presented in Table B.1 in Appendix B. All correlation coefficients are positive and greater than 0.5 with 0.6297 for those between Malaysia and Philippines and 0.5173 for those between Philippines and Singapore. These positive correlation coefficients indicate that the export earnings of selected commodity as a group of the member countries, on the average, move in the same direction. There are still some opposite movements, but on the average they move in the same direction. Therefore the amount fund saved from pooling resource is small. However, we should note that to compensate the export earnings of the selected commodities as a group has already saved some amount of drawings, since there are offsetting effects among different commodities in each country's commodity basket. The results of correlation coefficients among different commodities in each ASEAN countries are presented in

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[5]Yoshihiro Iwasaki and Hirohisa Kohama, loc.cit.

Tables B.2, B.3, B.4, B.5 and B.6 in Appendix B. The results of the correlation coefficients confirms the offsetting effects in each countries' selected commodities, since there are some negative correlation coefficients in each country's results.

The average annual drawings of the individual commodity variants (without resource pooling) are 291.5, 255.3 and 221.2 million US dollars when the trigger threshold percentages are 5, 7.5 and 10 percent respectively (i.e. variant No. 4, No. 5 and No. 6 in Table 4.19). With the presence of resource pooling, the net average annual drawings are 215.1, 190.5 and 165.3, saving 76.4, 64.8 and 55.9 million US dollars as the results of offsetting effects when the trigger threshold percentages are 5, 7.5 and 10 percent respectively. The fund needed for operation of the individual commodity variants are,on the average, substantial reduced which is about 25 percent of the average annual drawings (see Table 4.19). These substantial reduction of the needed fund due to the offsetting effects among different individual commodity agreements of ASEAN and those among countries within each commodity agreement as well. These offsetting effects can be seen from the correlation coefficients shown in Tables B.7 to B.16 in Appendix B. Table B.7 presents the correlation coefficients of the different commodities of ASEAN countries as a whole. There are about one-third of the correlation coefficients of the different ASEAN commodity exports which are

negative (see Table B.7). The raw sugar export of ASEAN countries as a whole tends to move in the opposite direction to those of tobacco, oil seeds, natural rubber and wood rough and wood shaped (see Table B.7). The movement of the export earnings of ASEAN tobacco export is opposite to those of palm oil, coconut oil and tin. Furthermore, the earnings movement of ASEAN palm oil export is opposite to those of oil seeds, natural rubber and wood rough and wood shaped (see Table B.7 in Appendix B). However, there is also a strong positive correlation between raw sugar and palm oil, coconut oil and tin. Moreover, ASEAN export earnings of palm oil is highly and positively correlated with those of coconut oil and tin.

Within each commodity of ASEAN, there are also offsetting effects among different exporting countries. Tables B.8 to B.16 in Appendix B show the correlation coefficients among countries of each commodity. Oil seeds, natural rubber, wood rough and wood shaped, palm oil, raw sugar, and coconut oil are the commodities in which there are positively correlated among export earnings of exporting countries, especially the latter five commodities (see Tables B.8, B.11, B.12, B.13, B.14 and B.15 in Appendix B). Spices, unmanufactured tobacco and tin are the commodities in which there are some offsetting movements of the export earnings among the exporting countries (see Tables B.9, B.10 and B.16 in Appendix B).

Eventhough the offsetting effects or the average annual drawings saved in the individual commodity variants are much greater than those in the commodity basket variants, the net average annual drawings of the commodity basket variants are lower than those in the individual commodity variants (see Table 4.19).

4. Stabilizing Effects

The real benefits of a compensatory financing scheme are related to its direct and indirect effects on the economic development of the exporting countries through more stable flow of export proceeds. We have, so far, looked into the direct benefits in terms of the average annual drawings and the average annual outstanding balances. However, these figures may not accurately represent the stabilizing effects of the variants. In this subsection, we try to measure the stabilizing effects of the scheme utilizing the instability index developed in Chapter III (i.e. equation (1)).

Tables 4.20 and 4.21 show the instability indices of ASEAN countries' export earnings of the selected commodities as a group before and after stabilized by the commodity basket variants and the individual commodity variants respectively. The instability indices of export earnings of selected commodities as a group after stabilized by the individual commodity variants decline more rapidly than those of the commodity basket variants (see Tables 4.20 and 4.21). However, both the individual commodity variants and the commodity

TABLE 4.20

INSTABILITY INDICES OF TOTAL SELECTED EXPORT EARNINGS BEFORE AND AFTER STABILIZED BY COMPENSATORY FINANCING SCHEME FOR SELECTED COMMODITIES AS A GROUP (COMMODITY BASKET VARIANT), 1964-1973

Country	Instability Index of Total Selected Export Earnings*			
	Without Stabilization	With Compensatory Financing Scheme		
		Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	27.79	7.08 (-74.52)	7.40 (-73.37)	8.81 (-68.30)
Malaysia	11.86	5.19 (-56.24)	6.96 (-41.32)	8.53 (-28.08)
Philippines	6.28	5.53 (-11.94)	5.47 (-12.90)	5.46 (-13.06)
Singapore	15.41	5.21 (-66.19)	6.26 (-59.38)	8.01 (-48.02)
Thailand	8.77	6.54 (-25.43)	7.89 (-10.03)	8.71 (- 0.01)

*Instability index is calculated by the average percentage deviation from five-year moving average trend which centers on the shortfall year.

Note: Figures in the parentheses represent the percentage reductions (indicated by minus signs) in the instability indices of total export earnings of all selected primary commodities.

Source: Computed from UN Yearbook of International Trade Statistics, various issues.

TABLE 4.21

INSTABILITY INDICES OF TOTAL SELECTED EXPORT EARNINGS BEFORE AND AFTER STABILIZED BY COMPENSATORY FINANCING SCHEME FOR INDIVIDUAL COMMODITY (INDIVIDUAL COMMODITY VARIANT), 1964-1973

Country	Instability Index of Total Selected Export Earnings*			
		With Compensatory Financing Scheme		
	Without Stabilization	Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	27.79	7.47 (-73.12)	6.27 (-77.44)	6.50 (-76.61)
Malaysia	11.86	3.86 (-67.45)	4.90 (-58.69)	5.87 (-50.51)
Philippines	6.28	4.91 (-21.82)	5.02 (-20.06)	4.96 (-21.02)
Singapore	15.41	4.73 (-69.31)	4.77 (-69.05)	6.23 (-59.57)
Thailand	8.77	5.25 (-40.14)	5.70 (-35.01)	6.51 (-25.77)

*Instability index is calculated by the average percentage deviation from five-year moving average trend which conters on the shortfall year.

Note: Figures in the parentheses are the percentage reductions (indicated by minus signs) in the instability indices of total selected commodities' export earning.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

basket variants substantially reduce the instability levels of ASEAN countries' export earnings of selected commodities as a group. The ranking of the beneficiaries in terms of the percentage reduction in instability index, from high to low, are Indonesia, Singaore, Malaysia, Thailand and Philippines for both the individual commodity variant and the commodity basket variant. The impacts of changing the trigger threshold percentages on the instability level of the selected commodities' exports also can be seen in Tables 4.20 and 4.21. In most cases, the bigger trigger threshold percentages, the less the compensatory financing scheme can stabilize the export earnings and hence the higher instability indices are. There are three special and interesting cases. First, the instability indices of the Philippines' selected export earnings are slightly different when the trigger threshold percentage changes. This may be due to the error of the decimal point in computation (see Table 4.20). Therefore, we may conclude that there is no difference in changing the trigger threshold percentage on the instability level in the export earnings of the selected commodities as a group of the Philippines. However, the commodity basket variants do reduced its instability level. Second, the same situation also appears in the case of Philippines, but it is now the case of individual commodity variants (see Table 4.21). The same reason as that of the commodity basket variant is given as an explanation of this second case. Third, after being stabilized by the individual commodity variants,

the instability level of export earnings of Indonesia's selected commodities are substantially reduced but the instability level after being stabilized by the five-percent trigger threshold is higher than those by the bigger trigger threshold percentages (see Table 4.21). We hypothesize that these results probably indicate the presence of the offsetting effects among different individual selected commodities. With the existence of these offsetting effects, the smaller trigger threshold percentage tends to wipe out these offsetting effects more than those with the bigger trigger threshold percentage. This situation is possible when the aggregated export earnings are stabilized by compensating the shortfalls of the individual commodities separately. Nevertheless, both the commodity basket variants and the individual commodity variants substantially stabilize the export earnings of the selected commodities as a group with all those three trigger threshold percentages.

It is also interesting to examine whether the total export earnings of ASEAN countries are also stabilized if the export earnings of the selected commodities are stabilized. Tables 4.22 and 4.23 present the instability indices of the total export earnings of each ASEAN countries with and without the compensatory financing schemes. The total export earnings of every ASEAN country, except Thailand, is stabilized by both the commodity basket variants (see Table 4.22) and the individual commodity variants (see Table 4.23). In the case of Thailand, the total export earnings are destabilized

TABLE 4.22

INSTABILITY INDICES OF TOTAL EXPORT EARNINGS BEFORE AND AFTER STABILIZED BY COMPENSATORY FINANCING SCHEME FOR SELECTED COMMODITIES AS A GROUP (COMMODITY BASKET VARIANT), 1964-1973

Countries	Instability Index of Total Export Earnings*			
		With Compensatory Financing Scheme		
	Without Stabilization	Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	19.86	12.24 (-38.37)	13.11 (-33.99)	13.98 (-29.61)
Malaysia	10.38	4.55 (-56.17)	6.30 (-39.31)	7.73 (-25.53)
Philippines	8.72	7.13 (-18.23)	7.69 (-11.81)	7.99 (-8.37)
Singapore	8.46	5.90 (-30.26)	6.42 (-24.11)	6.87 (-18.79)
Thailand	7.55	8.08 (7.02)	8.14 (7.82)	8.06 (6.76)

*Instability index is calculated by the average percentage deviation from five-year moving average trend which centers on the shortfall year.

Note: Figures in the parentheses represent the percentage reductions (indicated by minus signs) in the instability indices of total export earnings.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.23

INSTABILITY INDICES OF TOTAL EXPORT EARNINGS BEFORE AND AFTER STABILIZED BY COMPENSATORY FINANCING SCHEME FOR INDIVIDUAL COMMODITY (INDIVIDUAL COMMODITY VARIANT), 1964-1973

Country	Instability Index of Total Export Earnings*			
		With Compensatory Financing Scheme		
	Without Stabilization	Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	19.86	11.80 (-40.58)	12.37 (-37.71)	12.90 (-35.05)
Malaysia	10.38	3.55 (-65.80)	4.46 (-57.03)	5.65 (-45.67)
Philippines	8.72	6.12 (-29.82)	6.68 (-23.40)	7.24 (-16.97)
Singapore	8.46	5.71 (-32.62)	5.97 (-29.43)	6.35 (-24.94)
Thailand	7.55	7.86 (4.11)	7.86 (4.11)	7.88 (4.37)

*Instability index is calculated by the average percentage deviation from five-year moving average trend which centers on the shortfall year.

Note: Figures in the parentheses represent the percentage reductions (indicated by minus signs) in the instability indices of total export earnings.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

by both the commodity basket variants and the individual commodity variants and also in all the three trigger threshold percentages (see Tables 4.22 and 4.23). The explanation given is that there must be the offsetting effects between the export earnings of the selected commodities and the export earnings of the non-selected exports. Since the compensatory financing schemes do stabilize the export earnings of selected commodities of Thailand as previously shown. Therefore, stabilizing the earnings of the selected commodities reduces the degree of those offsetting effects resulting in the higher instability of Thailand's total export earnings.

Besides export earnings stability, another stabilizing effect of the compensatory financing scheme for ASEAN is its effect on the levels of export earnings of ASEAN countries. Tables 4.24 and 4.25 show the average export earnings of selected commodities of ASEAN countries after stabilized by the commodity basket variants and the individual commodity variants respectively. Moreover, the average total export earnings of ASEAN countries after stabilizing their selected commodities export earnings by the commodity basket variants and the individual commodity variants are shown in Tables 4.26 and 4.27 respectively. The empirical results indicate that to stabilize the selected commodities' export earnings of the ASEAN countries by both the commodity basket variant and the individual commodity variant also increase the export earnings of the selected commodities and those of their total export earnings as

TABLE 4.24

AVERAGE ANNUAL EXPORT EARNINGS OF TOTAL SELECTED COMMODITIES OF ASEAN COUNTRIES BEFORE AND AFTER STABILIZED BY THE COMMODITY BASKET VARIANT OF THE COMPENSATORY FINANCING SCHEME FOR ASEAN, AVERAGE OVER 1964-1973
(Thousand US dollars)

Country	Average Annual Export Earnings of Total Selected Commodities			
		With Compensatory Financing Scheme		
	Without Stabilization	Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	438,997	470,002 (7.06)	468,179 (6.65)	466,366 (6.23)
Malaysia	1,206,202	1,253,581 (3.93)	1,250,394 (3.66)	1,247,465 (3.42)
Philippines	611,636	639,577 (4.57)	636,897 (4.13)	633,244 (3.53)
Singapore	411,089	431,178 (4.89)	428,716 (4.29)	426,692 (3.80)
Thailand	230,730	243,830 (5.68)	242,118 (4.94)	240,999 (4.45)

Note: Figures in the parentheses are the percentage increases of the average annual export earnings of total selected commodities.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.25

AVERAGE ANNUAL EXPORT EARNINGS OF TOTAL SELECTED COMMODITIES OF ASEAN COUNTRIES BEFORE AND AFTER STABILIZED BY THE INDIVIDUAL COMMODITY VARIANT OF THE COMPENSATORY FINANCING SCHEME FOR ASEAN, AVERAGE OVER 1964-1973
(Thousand US dollars)

Country	Average Annual Export Earnings of Total Selected Commodities			
		With Compensatory Financing Scheme		
	Without Stabilization	Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	438,997	469,798 (7.02)	467,155 (6.41)	464,019 (5.70)
Malaysia	1,206,202	1,246,532 (3.34)	1,240,790 (2.87)	1,232,928 (2.22)
Philippines	611,636	642,499 (5.05)	641,065 (4.81)	638,533 (4.40)
Singapore	411,089	430,353 (4.69)	427,508 (3.99)	424,743 (3.32)
Thailand	230,730	243,435 (5.51)	242,143 (4.95)	240,621 (4.29)

Note: Figures in the parentheses are the percentage increases of the average annual export earnings of total selected commodities after stabilization.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.26

AVERAGE ANNUAL TOTAL EXPORT EARNINGS OF ASEAN COUNTRIES BEFORE AND AFTER STABILIZED BY THE COMMODITY BASKET VARIANT OF THE COMPENSATORY FINANCING SCHEME FOR ASEAN, AVERAGE OVER 1964-1973
(Thousand US dollars)

Country	Average Annual Total Export Earnings			
		With Compensatory Financing Scheme		
	Without Stabilization	Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	1,043,545	1,075,540 (3.07)	1,072,726 (2.80)	1,070,913 (2.62)
Malaysia	1,616,745	1,664,124 (2.93)	1,660,936 (2.73)	1,658,007 (2.55)
Philippines	996,449	1,024,390 (2.80)	1,021,710 (2.54)	1,018,057 (2.17)
Singapore	1,604,761	1,624,850 (1.25)	1,622,388 (1.10)	1,620,364 (0.97)
Thailand	803,944	817,044 (1.63)	815,331 (1.42)	814,213 (1.28)

Note: Figures in the parentheses are the percentage increases of the average annual total export earnings after stabilization.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE 4.27

AVERAGE ANNUAL TOTAL EXPORT EARNINGS OF ASEAN COUNTRIES BEFORE AND AFTER STABILIZED BY THE INDIVIDUAL COMMODITY VARIANT OF THE COMPENSATORY FINANCING SCHEME FOR ASEAN, AVERAGE OVER 1964-1973
(Thousand US dollars)

Country	Average Annual Total Export Earnings			
		With Compensatory Financing Scheme		
	Without Stabilization	Trigger Threshold=5%	Trigger Threshold=7.5%	Trigger Threshold=10%
Indonesia	1,043,545	1,073,945 (2.91)	1,071,702 (2.70)	1,068,566 (2.40)
Malaysia	1,616,745	1,657,073 (2.49)	1,651,332 (2.14)	1,643,470 (1.65)
Philippines	996,449	1,027,312 (3.10)	1,025,878 (2.95)	1,023,346 (2.70)
Singapore	1,604,761	1,624,022 (1.20)	1,621,180 (1.02)	1,618,415 (0.85)
Thailand	803,944	816,649 (1.58)	815,356 (1.42)	813,835 (1.23)

Note: Figures in the parentheses are the percentage increasesof the average annual total export earnings after stabilization.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

well (see Tables 4.24, 4.25, 4.26 and 4.27). Though, the increases are small in the relation to their export earnings, they are still sizable in absolute terms.

E. The Concluding Remarks

The commodity basket variants need less fund than the individual commodity variants in the cases of no pooling resources among countries and commodities. This is due to the offsetting effects among different commodities in each country's export earnings of the selected commodities as a group. With resource pooling, the fund needed in the individual commodity variants is reduced by much more than the reduction of fund needed in the commodity basket variants, but the absolute fund needed of the individual commodity variants are still larger than those of the commodity basket variants.

The distributions of benefits are considered for country distribution, commodity distribution and country distribution within each commodity. The country distribution of benefits shows that Malaysia and Indonesia are the first and second largest beneficiaries and Thailand is the smallest beneficiary both in the commodity basket variant and the individual commodity variant. But Singapore comes third and fourth in the commodity basket variant and the individual commodity variant respectively. The country distribution of benefits generated by the individual commodity variants is

consistent with the country distribution of export shares, whereas those of the commodity basket are not consistent with the distribution of export shares as a result of the outweighting effects between countries' instability levels and countries' export shares. However, the average annual outstanding balance indicating the amount of fund tied up with each country is the same for both variants. The country ranking in terms of the average outstanding balance,from high to low, is Indonesia, Malaysia, Singapore, Philippines and Thailand.

The commodity distribution of benefits generated by the individual commodity variants is consistent with the commodities' shares of exports. Natural rubber alone receives some 42 percent of the total benefits in terms of average annual drawings. The next four largest beneficiaries are wood rought and wood shaped, raw sugar, palm oil, and tin, which altogether account for some 46 percent of the total benefits, leaving some 12 percent for the remaining four commodities.

The country distribution of benefits within each commodity is different from commodity to commodity. In general, the country distributions of benefits within individual commodities conform with the countries' export shares of that commodity unless the countries' instability levels are substantially different from countries' export shares.

The stabilizing effects of the compensatory financing schemes in this study are examined in two features namely the export earnings stability and the export earnings level. The export earnings of selected commodities as a group are stabilized for every ASEAN country in both the commodity basket variants and the individual commodity variants. The total export earnings are also stabilized, by both types of variants for every country, with the exception of Thailand. In the case of Thailand, stabilizing the export earnings of the selected commodities as a group does not stabilize its total export earnings due to the presence of the offsetting effects between the export earnings of the selected commodities and those of the non-selected exports. However, the destabilizing effects on total export earnings are not so great. In the case of export earnings levels, both the individual commodity variants and the commodity basket variants increase the level of export earnings of the selected commodities of every country as well as the total export earnings levels.

CHAPTER V

SUMMARY AND CONCLUSION

A. Summary and Conclusion

In this study, the analysis is divided into two parts: the stability origin identification and the compensatory financing schemes for ASEAN countries. The selected commodities covered in this study are raw sugar (SITC 0611), spices (SITC 075), unmanufactured tobacco (SITC 121), oil seeds, oil nuts and oil kernels (SITC 221), natural rubber (SITC 2311), wood rough and wood shaped (SITC 24), palm oil (SITC 4222), coconut oil (SITC 4223), and tin (SITC 2836 and SITC 6871).

In identifying the instability origin, this study tries to identify whether the export earnings instability of each selected commodity is caused by the shifts in demand or supply shifts and determine elasticities of demand and supply. The implications for price stabilization via buffer stock are drawn from the results of instability origin identification since the effects of price stabilization via buffer stock on the earnings stability, earnings level and pure welfare, depend on the sources of instability and the elasticities of demand and supply. The empirical results of instability origin identification show that different exporting countries in ASEAN are likely to have different sources of earnings

instability in the same export commodity, except in palm oil and tin alloys. Some countries export the same commodity and face the same source of instability, yet they are faced with different elasticities. The results of instability origin identification cannot give the definite conclusion on the implication for price stabilization via buffer stock. However, two conclusions can be drawn from the analysis. First, with price stabilization policy, there is a tendency for the ASEAN countries to trade off between the export earnings stability, and the export earnings levels and pure welfare effects. Second, the definite conclusion cannot be made unless the exact quantitative results of demand and supply elasticities must be known in determining the effects of price stabilization on the selected commodities of ASEAN countries.

The second part of this study concerns the compensatory financing scheme for ASEAN selected commodities' export earnings. Two types the ASEAN compensatory financing scheme are examined, namely the individual commodity variant and the commodity basket variant. Three trigger threshold percentages are applied to both variants, i.e. 5, 7.5 and 10 percent -- the trigger threshold percentage is the reference level for compensation and repayment. For example, the five-percent trigger threshold implies that the 5 percent above and below the estimated trend value of the earnings will be the reference levels for compensation and repayment. The

export earnings which fall between this band will not require compensation or repayment.

The empirical results show that firstly, without the resource pooling, the commodity basket variants need less fund than the individual commodity variants in every trigger threshold percentage. For example, the commodity basket variant with the five-percent trigger threshold needs 222.8 and 522.2 million US dollars for the average annual drawings and the average outstanding balance respectively. The individual commodity variant with the same trigger threshold percentage needs 291.5 and 512.2 million US dollars for the average annual drawings and the average annual outstanding balance respectively. In the case of resource pooling, the average annual drawings become 208.3 and 215.1 million US dollars for the commodity basket variant and the individual commodity variant respectively.

The country distribution of benefits in terms of the average annual drawings is likely to be consistent with the countries' export shares unless there are outweighting effects between instability levels and export shares. Malaysia and Indonesia receive some 33 and 28 percent of the average annual drawings, leaving about 39 percent for the remaining three countries. Only 6 percent is received by Thailand, the smallest beneficiary.

The commodity distribution of benefits is also consistent with the commodities' export shares. Natural rubber alone receives some 42 percent of the average annual drawings. The five largest commodities in terms of export shares and average annual drawings received are natural rubber, wood rough and wood shaped, raw sugar, palm oil and tin. These five largest beneficiaries receive some 88 percent of the average annual drawings comparing with their export shares of 88 percent.

The country distribution of benefits within each commodity depends upon the outweighting effects between the earnings instability level of each exporting country and the export share of each exporting country. If the instability levels are not substantially different among exporting countries, the benefits within that particular commodity will be distributed in favor of the country with a bigger export share.

For the stabilizing effects, both the commodity basket variant and the individual commodity variants increase the levels of total export earnings and the export earnings of the selected commodities as a group. Moreover both variants do stabilize the export earnings of selected commodities as a group as well as the total export earnings of every ASEAN country, except Thailand. In the case of Thailand, stabilizing the export earnings of the selected commodities, in turn, destabilizes the total export

earnings of Thailand (i.e. the instability index of the total export earnings rises from 7.55 percent to 8.08 percent in the case of the commodity basket variant are from 7.55 percent to 7.86 percent in the case of the individual commodity variant). These may be because of the small share of the selected commodities in the total export (only 27.27 percent, see Table 4.1 in Chapter IV), and the presence of the offsetting effects between the export earnings of the selected commodities and those of the non-selected exports.

From the analysis, however, we cannot give the definite conclusion about the best variant of the compensatory financing scheme for ASEAN countries. Since in selecting the best variant for the ASEAN countries, we need to know more information and answer more questions. Firstly, is the stability on macro level more preferable than the stability on micro level for ASEAN countries? If the stability in macro level is more preferable, the commodity basket variant is better than the individual commodity variant since it needs less fund than the individual commodity variant and stabilized macro economic variables, e.g. export earnings, government revenue etc. Secondly, what is considered more important between the level of stability and the amount of fund needed? If there is no financial constraint for the compensatory financing scheme for ASEAN countries, the individual commodity variant is more preferable than the commodity basket variant since the former can reduce the instability level more effective than the latter and the distribution

of benefits generated by the former variant is more consistent with the countries' export shares. Finally, the indirect effects of both variants on the economic development are not known. However, it can be seen that the compensatory financing scheme is better than price stabilization via buffer stock since the definite conclusion of the effects of price stabilization via buffer stock cannot be drawn, at least for the commodities of ASEAN selected in this study.

B. Suggestions for Further Study

We did not take into consideration inflation in this study. Further study should be made by taking inflation into account, since inflation changes the stream of earnings in two ways: it increases the apparent rate of growth, and it tends to transform the series into a geometric series irrespective of its form in real terms. Therefore, the IMF-type scheme which is appropriate for real earnings or under noninflationary conditions would be inappropriate under inflationary conditions.

Another study should be done by excluding the earnings in the shortfall year in the calculation of the target earnings. Since the IMF-type target earnings is determined by the five-year arithmetic moving average of earnings centered on the shortfall year, this may cause an underestimation of both shortfalls and surpluses by an average of 20 percent (the shortfall enters the calculation with a weight of about one-fifth).

Lastly, this study examines the compensatory financing scheme for ASEAN without installment period and the compensations are made in the form of interest-free loans. These may induce deliberate creations of fluctuations in export earnings. It is, therefore, interesting to investigate if an installment period and the interest-charged loans can alleviate this problem.

APPENDICES

APPENDIX A

IMPORTS AND EXPORTS OF SELECTED COMMODITIES OF ASEAN COUNTRIES CLASSIFIED BY IMPORT ORIGIN AND EXPORT DESTINATION

TABLE A.1

EXPORTS OF SELECTED COMMODITIES OF INDONESIA CLASSIFIED BY EXPORT DESTINATION, AVERAGE OVER 1974-1975
(Thousand US dollars)

SITC	Commodity	World	ASEAN				
			Malaysia	Philippines	Singapore	Thailand	Total
	Total export	7,278,269	70,164 (0.96)	17,019 (0.23)	595,576 (8.18)	57,575 (0.79)	740,333 (10.16)
075	Spices	32,060	-	-	6,305 (19.66)	-	6,305 (19.66)
121	Tobacco, unmanufactured	28,959	-	-	235 (0.81)	-	235 (0.81)
221	Oil Seeds, Oil Nuts and Oil Kernels	11,901	701 (5.89)	-	3,712 (31.19)	-	4,413 (37.08)
2311	Natural Rubber	420,592	2,385 (0.57)	62 (0.01)	211,792 (50.36)	-	214,239 (50.94)
24	Wood, Lumber and Cork	616,492	3,967 (0.64)	-	30,695 (4.98)	115 (0.02)	34,777 (5.64)
2836	Ores and Concentrates of Tin	54,368	52,580 (96.71)	-	-	-	52,580 (96.71)
4222	Palm Oil	154,479	575 (0.37)	96 (0.06)	2,190 (1.42)	-	2,861 (1.85)
6871	Tin Alloys, unwrought	75,769	867 (1.15)	-	-	-	867 (1.15)

Note: Figures in the parentheses represent export value of each commodity exported to each member country as the percentage share of total export value of that commodity (the value in the column denoted by "World").

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.2

IMPORTS OF SELECTED COMMODITIES OF INDONESIA CLASSIFIED BY IMPORT ORIGIN, AVERAGE OVER 1974-1975.
(Thousand US dollars)

SITC	Commodity	World	ASEAN				
			Malaysia	Philippines	Singapore	Thailand	Total
	Total Import	4,313,976	16,886 (0.39	12,804 (0.30)	144,348 (3.35)	59,752 (1.39)	233,788 (5.43)
075	Spices	52,321	-	-	1,910 (3.65)	-	1,910 (3.65)
121	Tobacco, unmanufactured	7,643	-	169 (2.21)	-	-	169 (2.21)
221	Oil seeds, Oil Nuts and Oil Kernels	803	-	-	151 (18.82)	353 (43.93)	504 (62.75)
2311	Natural Rubber	53	-	-	-	-	-
24	Wood, Lumber and Cork	209	-	-	65 (30.86)	-	65 (30.86)
2836	Ore and Concentrates of Tin	-	-	-	-	-	-
4222	Palm Oil	-	-	-	-	-	-
6871	Tin Alloys, unwrought	-	-	-	-	-	-

Note: Figures in the parentheses represent the import value of each commodity imported from each member country as the percentage share of total import value of that commodity.

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.3

EXPORTS OF SELECTED COMMODITIES OF MALAYSIA CLASSIFIED BY EXPORT DESTINATION, AVERAGE OVER 1974-1975
(Thousand US dollars)

SITC	Commodity	World	ASEAN				
			Indonesia	Philippines	Singapore	Thailand	Total
	Total Export	4,040,435	23,467 (0.58)	50,893 (1.26)	848,959 (21.01)	48,634 (1.20)	971,952 (24.05)
075	Spices	46,032	212 (0.46)	-	34,491 (74.93)	62 (0.13)	34,765 (75.52)
221	Oil Seeds, Oil Nuts & Oil Kernels	5,399	-	69 (1.27)	4,909 (90.93)	-	4,978 (92.20)
2311	Natural Rubber	1,021,804	-	-	249,230 (24.39)	-	249,230 (24.39)
24	Wood, Lumber and Cork	522,312	-	-	64,883 (11.75)	-	64,883 (11.75)
2836	Ore and Concentrates of Tin	-	-	-	-	-	-
4222	Palm Oil	500,379	-	336 (0.07)	95,321 (19.05)	-	95,657 (19.12)
4223	Coconut Oil	30,776	-	-	8,169 (26.54)	548 (1.78)	8,717 (28.32)
6871	Tin Alloys, unwrought	566,000	-	4,269 (0.75)	3,029 (0.54)	-	7,298 (1.29)

Note: Figures in the parentheses represent export value of each commodity exported to each member country as the percentage share of total export value of that commodity (the value in the column denoted by "World").

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.4

IMPORTS OF SELECTED COMMODITIES OF MALAYSIA CLASSIFIED BY IMPORT ORIGIN, AVERAGE OVER 1974-1975
(Thousand US dollars)

SITC	Commodity	World	ASEAN				
			Indonesia	Philippines	Singapore	Thailand	Total
	Total Import	3,817,637	87,940 (2.30)	17,471 (0.46)	319,928 (8.38)	142,660 (3.74)	567,998 (14.88)
075	Spices	8,687	828 (9.53)	-	205 (2.36)	1,347 (15.50)	2,380 (27.39)
221	Oil Seeds, Oil Nuts & Oil Kernels	13,891	2,045 (14.72)	1,851 (13.32)	969 (6.98)	2,731 (19.66)	7,596 (54.68)
2311	Natural Rubber	20,324	1,302 (6.40)	-	-	16,681 (82.07)	17,982 (88.47)
24	Wood, Lumber and Cork	7,595	5,366 (70.65)	180 (2.36)	-	1,351 (17.79)	6,897 (90.80)
2836	Ores and Concentrates of Tin	103,109	53,097 (51.50)	-	-	-	53,097 (51.50)
4222	Palm Oil	438	188 (42.81)	-	239 (54.45)	-	426 (97.26)
4223	Coconut Oil	884	-	330 (37.27)	535 (60.46)	-	864 (97.73)
6871	Tin Alloys, unwrought	720	-	-	306 (42.53)	-	306 (42.53)

Note: Figures in the parentheses represent the import value of each commodity imported from each member country as the percentage share of total import value of that commodity.

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.5

EXPORTS OF SELECTED COMMODITIES OF PHILIPPINES CLASSIFIED BY EXPORT DESTINATION, AVERAGE OVER 1974-1975
(Thousand US Dollars)

SITC	Commodity	World	ASEAN				
			Indonesia	Malaysia	Singapore	Thailand	Total
	Total Export	2,496,784	14,461 (0.58)	4,646 (0.19)	24,998 (1.00)	3,881 (0.15)	47,985 (1.92)
0611	Raw Sugar	659,051	-	-	-	-	-
121	Tobacco, unmanufactured	31,854	222 (0.70)	-	324 (1.01)	-	546 (1.71)
221	Oil Seeds, Oil Nuts and Oil Kernels	157,528	-	-	-	-	-
24	Wood, Lumber and Cork	233,500	-	-	519 (0.23)	-	519 (0.23)
4223	Coconut Oil	305,516	-	82 (0.03)	2,872 (0.94)	-	2,954 (0.97)

Note: Figures on the parentheses represent export value of each commodity exported to each member country as the percentage share of total export value of that commodity (the value in the column denoted by "World").

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.6

IMPORTS OF SELECTED COMMODITIES OF PHILIPPINES CLASSIFIED BY IMPORT ORIGIN, AVERAGE 1974-1975
(Thousand US dollars)

SITC	Commodity	World	ASEAN				
			Malaysia	Philippines	Singapore	Thailand	Total
	Total Import	3,621,923	35,279 (0.97)	42,113 (1.16)	25,585 (0.71)	26,860 (0.74)	129,836 (3.58)
0611	Raw Sugar	-	-	-	-	-	-
121	Tobacco, unmanufactured	17,692	-	-	-	-	-
221	Oil Seeds, Oil Nuts and Oil Kernels	1,827	-	-	-	299 (16.37)	299 (16.37)
24	Wood, Lumber and Cork	108	-	-	-	-	-
4223	Coconut Oil	-	-	-	-	-	-

Note: Figures in the parentheses represent the import value of each commodity imported from each member country as the percentage share of total import value of that commodity.

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.7

EXPORTS OF SELECTED COMMODITIES OF SINGAPORE CLASSIFIED BY EXPORT DESTINATION, AVERAGE OVER 1974-1975.
(Thousand US Dollars)

SITC	Commodity	World	ASEAN				
			Indonesia	Malaysia	Philippines	Thailand	Total
	Total Export	5,581,110	-	715,417 (12.82)	52,596 (0.94)	163,996 (2.94)	932,009 (16.70)
075	Spices	70,356	-	3,630 (5.16)	311 (0.44)	391 (0.56)	4,332 (6.16)
221	Oil Seeds, Oil Nuts and Oil Kernels	6,729	-	2,092 (31.09)	-	-	2,092 (31.09)
2311	Natural Rubber	697,158	-	4,339 (0.62)	206 (0.03)	-	4,545 (0.65)
2836	Ores and Concentrates of Tin	9,262	-	-	-	-	-
4222	Palm Oil	902,025	-	249 (0.03)	161 (0.02)	-	409 (0.05)
4223	Coconut Oil	18,601	-	315 (1.69)	-	226 (1.21)	541 (1.90)
6871	Tin Alloys, unwrought	3,489	-	439 (12.58)	-	-	439 (12.58)

Note: Figures in the parentheses represent export value of each commodity exported to each member country as the percentage share of total export value of that commodity (the value in the column denoted by "World").

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.8

IMPORTS OF SELECTED COMMODITIES OF SINGAPORE CLASSIFIED BY IMPORT ORIGIN, AVERAGE OVER 1974-1975
(Thousand US Dollars)

SITC	Commodity	World	ASEAN				
			Indonesia	Malaysia	Philippines	Thailand	Total
	Total Import	8,239,454	-	791,836 (9.61)	25,310 (0.31)	196,692 (2.39)	963,838 (12.31)
075	Spices	62,517	-	3,627 (5.80)	-	1,068 (1.71)	4,692 (7.51)
221	Oil Seeds, Oil Nuts and Oil Kernels	25,000	-	-	84 (0.34)	2,825 (11.30)	2,910 (11.64)
2311	Natural Rubber	388,165	-	312,951 (80.62)	-	41,344 (10.65)	354,295 (91.27)
2836	Ores and Concentrates of Tin	-	-	-	-	-	-
4222	Palm Oil	93,257	-	92,741 (99.45)	-	-	92,741 (99.45)
4223	Coconut Oil	10,814	-	6,189 (57.23)	2,633 (24.35)	-	8,822 (81.58)
6871	Tin Alloys, unwrought	6,665	-	5,058 (75.89)	-	-	5,058 (75.89)

Note: Figures in the parentheses represent import value of each commodity imported to each member country as the percentage share of total import value of that commodity.

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.9

EXPORTS OF SELECTED COMMODITIES OF THAILAND CLASSIFIED BY EXPORT DESTINATION, AVERAGE OVER 1974-1975
(Thousand US Dollars)

SITC	Commodity	World	ASEAN				
			Indonesia	Malaysia	Philippines	Singapore	Total
	Total Export	2,378,329	63,710 (2.68)	108,622 (4.57)	28,152 (1.18)	195,522 (8.22)	396,005 (16.65)
0611	Raw Sugar	232,138	-	18,756 (8.08)	-	6,583 (2.84)	25,339 (10.92)
075	Spices	799	-	-	-	126 (15.72)	126 (15.72)
121	Tobacco, unmanufactured	25,012	-	168 (0.67)	-	860 (3.44)	1,028 (4.11)
221	Oil Seeds, Oil Nuts and Oil Kernels	21,588	909 (4.21)	1,759 (8.15)	60 (0.28)	2,892 (13.39)	5,619 (26.03)
2311	Natural Rubber	209,429	120 (0.06)	19,798 (9.45)	-	36,376 (17.37)	56,293 (26.88)
24	Wood, Lumber and Cork	34,678	-	1,099 (3.17)	-	640 (1.84)	1,738 (5.01)
2836	Ores and Concentrates of Tin	-	-	-	-	-	-
6871	Tin Alloys, unwrought	132,415	-	-	235 (0.18)	1,109 (0.84)	1,343 (1.02)

Note: Figures in the parentheses represent export value of each commodity exported to each member country as the percentage share of total export value of that commodity (the value in the column denoted by "World").

Source: Computed from data in UN Commodity Trade Statistics, various issues.

TABLE A.10

IMPORTS OF SELECTED COMMODITIES OF THAILAND CLASSIFIED BY IMPORT ORIGIN
AVERAGE OVER 1974-1975
(Thousand US Dollars)

SITC	Commodity	World	ASEAN				
			Indonesia	Malaysia	Philippines	Singapore	Total
	Total Import	3,217,478	3,151 (0.10)	11,376 (0.35)	4,805 (0.15)	56,914 (1.77)	76,245 (2.37)
0611	Raw Sugar	-	-	-	-	-	-
075	Spices	910	320 (35.11)	-	-	-	320 (35.11)
121	Tobacco, unmanufactured	32,496	-	-	-	-	-
221	Oil Seeds, Oil Nuts and Oil Kernels	-	-	-	-	-	-
2311	Natural Rubber	-	-	-	-	-	-
24	Wood, Lumber and Cork	6,561	186 (2.83)	557 (8.49)	-	123 (1.87)	866 (13.19)
2836	Ores and Concentrates of Tin	-	-	-	-	-	
6871	Tin Alloys, unwrought	-	-	-	-	-	-

Note: Figures in the parentheses represent import value of each commodity imported to each member country as the percentage share of total import value of that commodity.

Source: Computed from data in UN Commodity Trade Statistics, various issues.

APPENDIX B

CORRELATION COEFFICIENTS OF SELECTED COMMODITIES OF ASEAN COUNTRIES

TABLE B.1

CORRELATION COEFFICIENTS OF MEMBER COUNTRIES' EXPORT EARNINGS OF TOTAL SELECTED COMMODITIES, 1962-1975

	INDONESIA	MALAYSIA	PHILIPPINES	SINGAPORE	THAILAND
INDONESIA	1.0000				
MALAYSIA	0.7717	1.0000			
PHILIPPINES	0.6378	0.6297	1.0000		
SINGAPORE	0.7799	0.9586	0.5173	1.0000	
THAILAND	0.7034	0.9123	0.7572	0.8627	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.2

CORRELATION COEFFICIENTS OF SELECTED COMMODITIES' EXPORT EARNINGS OF INDONESIA, 1962-1975

SITC	075	121	221	2311	24	4222	6871
075	1.0000						
121	0.7158	1.0000					
221	0.0600	0.0506	1.0000				
2311	0.3299	0.3904	0.4796	1.0000			
24	0.0900	0.2875	0.3827	0.6501	1.0000		
4222	0.2921	-0.1064	0.3224	0.5125	0.0826	1.0000	
6871	-0.0813	-0.0800	0.5211	0.6984	0.4367	0.4838	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.3

CORRELATION COEFFICIENTS OF SELECTED COMMODITIES' EXPORTS EARNINGS OF MALAYSIA, 1962-1975

SITC	075	221	2311	24	4222	4223	6871
075	1.0000						
221	0.1128	1.0000					
2311	0.3139	0.6200	1.0000				
24	-0.0484	0.6749	0.8660	1.0000			
4222	0.7486	-0.1738	-0.1072	-0.3672	1.0000		
4223	0.6153	0.3388	0.2098	0.1121	0.7888	1.0000	
6871	0.8513	0.1757	0.3476	-0.0456	0.7481	0.6236	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.4

CORRELATION COEFFICIENTS OF SELECTED COMMODITIES' EXPORT EARNINGS OF PHILIPPINES, 1962-1975

SITC	0611	121	221	24	4223
0611	1.0000				
121	-0.0193	1.0000			
221	-0.2253	0.2146	1.0000		
24	-0.2371	0.3512	0.4306	1.0000	
4223	0.8779	0.1363	0.0809	0.1640	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.5

CORRELATION COEFFICIENTS OF SELECTED COMMODITIES' EXPORT EARNINGS OF SINGAPORE, 1962-1975

SITC	075	221	2311	4222	4225	6871
075	1.0000					
221	-0.0044	1.0000				
2311	0.0190	0.3301	1.0000			
4222	0.6105	-0.1950	-0.0538	1.0000		
4223	0.4143	0.6088	0.1756	0.5883	1.0000	
6871	0.3128	0.5242	-0.0046	0.2108	0.4936	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.6

CORRELATION COEFFICIENTS OF SELECTED COMMODITIES' EXPORT EARNINGS OF THAILAND, 1962-1975

SITC	0611	075	121	221	2311	24	6871
0611	1.0000						
075	0.1891	1.0000					
121	0.7630	0.3069	1.0000				
221	-0.3765	-0.1067	-0.4683	1.0000			
2311	-0.2728	-0.1182	-0.5005	0.8406	1.0000		
24	-0.4822	-0.1309	-0.5017	0.9247	0.8685	1.0000	
6871	0.3523	0.3525	0.2222	0.2163	0.2070	0.1651	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.7

CORRELATION COEFFICIENTS OF SELECTED COMMODITIES' EXPORT EARNINGS OF ASEAN COUNTRIES, 1962-1975

SITC	0611	075	121	221	2311	24	4222	4223	6871
0611	1.0000								
075	0.4079	1.0000							
121	-0.4566	0.1896	1.0000						
221	-0.2098	0.2092	0.5844	1.0000					
2311	-0.0859	0.0103	0.2141	0.4202	1.0000				
24	-0.2867	0.0047	0.4362	0.7182	0.8565	1.0000			
4222	0.9723	0.5668	-0.3594	-0.0962	-0.0079	-0.2183	1.0000		
4223	0.8291	0.4346	-0.2440	0.3150	0.2760	0.1837	0.8694	1.0000	
6871	0.6679	0.2226	-0.3335	-0.0168	0.5160	0.2671	0.6667	0.7129	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.8

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN RAW SUGAR OF ASEAN EXPORTING COUNTRIES, 1962-1975

0611	PHILIPPINES	THAILAND
PHILIPPINES	1.0000	
THAILAND	0.9113	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.9

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN SPICES OF ASEAN EXPORTING COUNTRIES, 1962-1975

075	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
INDONESIA	1.0000			
MALAYSIA	-0.2646	1.0000		
SINGAPORE	-0.7761	0.5744	1.0000	
THAILAND	0.5244	0.1758	0.4935	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.10

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN TOBACCO, UNMANUFACTURED OF ASEAN EXPORT COUNTRIES, 1962-1975

121	INDONESIA	PHILIPPINES	THAILAND
INDONESIA	1.0000		
PHILIPPINES	-0.2129	1.0000	
THAILAND	-0.2715	-0.0305	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.11

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN OIL SEEDS, OIL NUTS AND OIL KERNELS OF ASEAN EXPORTING COUNTRIES, 1962-1975

221	INDONESIA	MALAYSIA	PHILIPPINES	SINGAPORE	THAILAND
INDONESIA	1.0000				
MALAYSIA	0.7158	1.0000			
PHILIPPINES	0.1409	0.3148	1.0000		
SINGAPORE	0.7277	0.6309	0.3763	1.0000	
THAILAND	0.3330	0.6950	0.5615	0.4215	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B.12

CORRELATION COEFFIENTS OF EXPORT EARNING IN NATURAL RUBBER OF ASEAN EXPORTING COUNTRIES, 1962-1975

2311	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
INDONESIA	1.0000			
MALAYSIA	0.6773	1.0000		
SINGAPORE	0.7372	0.9715	1.0000	
THAILAND	0.6042	0.9890	0.9393	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B. 13

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN WOOD ROUGH AND WOOD SHAPED OF ASEAN EXPORTING COUNTRIES, 1962-1975

24	INDONESIA	MALAYSIA	PHILIPPINES	THAILAND
INDONESIA	1.0000			
MALAYSIA	0.9560	1.0000		
PHILIPPINES	0.9066	0.9378	1.0000	
THAILAND	0.9495	0.9485	0.8817	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B. 14

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN PALM OIL OF ASEAN EXPORTING COUNTRIES, 1962-1975

4222	INDONESIA	MALAYSIA	SINGAPORE
INDONESIA	1.0000		
MALAYSIA	0.8458	1.0000	
SINGAPORE	0.8471	0.9072	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B. 15

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN COCONUT (COPRA) OIL OF ASEAN EXPORTING COUNTRIES, 1962-1975

4223	MALAYSIA	PHILIPPINES	SINGAPORE
MALAYSIA	1.0000		
PHILIPPINES	0.9506	1.0000	
SINGAPORE	0.8701	0.7768	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

TABLE B. 16

CORRELATION COEFFICIENTS OF EXPORT EARNINGS IN TIN OF ASEAN EXPORTING COUNTRIES. 1962-1975

6871	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
INDONESIA	1.0000			
MALAYSIA	0.3353	1.0000		
SINGAPORE	0.4802	-0.2229	1.0000	
THAILAND	0.5737	0.1266	0.4090	1.0000

Note: Correlation coefficients are calculated by using the deviations from five-year moving average trend lines.

Source: Computed from data in UN Yearbook of International Trade Statistics, various issues.

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