# The Political Economy of International Cocoa Agreement

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# THE POLITICAL ECONOMY OF INTERNATIONAL COCOA AGREEMENT

## INTRODUCTION

The world output of cocoa comes exclusively from the less developed countries (LDCs) while its consumption is concentrated in the developed or industrial countries of Western Europe and the United States of America. The bulk of the primary trade is in raw beans, although a rising proportion of exports is in the form of semi-processed products. A distinct feature of the market for cocoa is the wide and rapid swing in prices. This is believed by the major producing countries to constitute a problem to their planned development activity which is partly financed by export earnings from cocoa and other primary commodities. Earnings from cocoa also constitute a major source of income to a sizeable number of peasant farmers producing cocoa in these countries.[1] In particular, the governments of these countries consider fiscal revenues, obtained through taxes and other levies on cocoa production and export, an important source of funds to finance their operations. In order to eliminate disorderly marketing associated with violent swings in cocoa prices, these countries have persistently sought an international agreement designed to achieve relative stability of cocoa prices within a "reasonable" price range. It is also frequently asserted that the consuming nations should benefit from the orderly marketing of cocoa which price stability is hoped to bring about.

This paper attempts a critical analysis of this effort to obtain a solution to the problem of cocoa price instability through a workable international cocoa agreement. In section one, a brief review of world production and marketing of cocoa is given as a background.

Section two is a brief historical review of the evolution of the International Cocoa Agreement (ICA). The third section discusses the main provisions for operating the agreement. Section four presents an economic analysis of the likely impact of the cocoa price stabilization scheme embodied in ICA, using simple demand and supply apparatus. The final section concludes the paper with some observations about the future of the agreement.

## Part I
## WORLD PRODUCTION AND MARKETING OF COCOA

Ghana, Nigeria, Ivory Coast, Cameroon and Brazil produce close to 80 percent of world cocoa output. The United States, Western Europe and Japan consume the bulk of this output. In the sixteen years between 1961-62 crop season and 1976-77 the world output of cocoa increased by 22.0 percent or 1.6 percent per annual. The pattern and degree of fluctuation is indicated in Chart 1 and Table 1. In the same period, world consumption increased from 1.1 million to 1.5
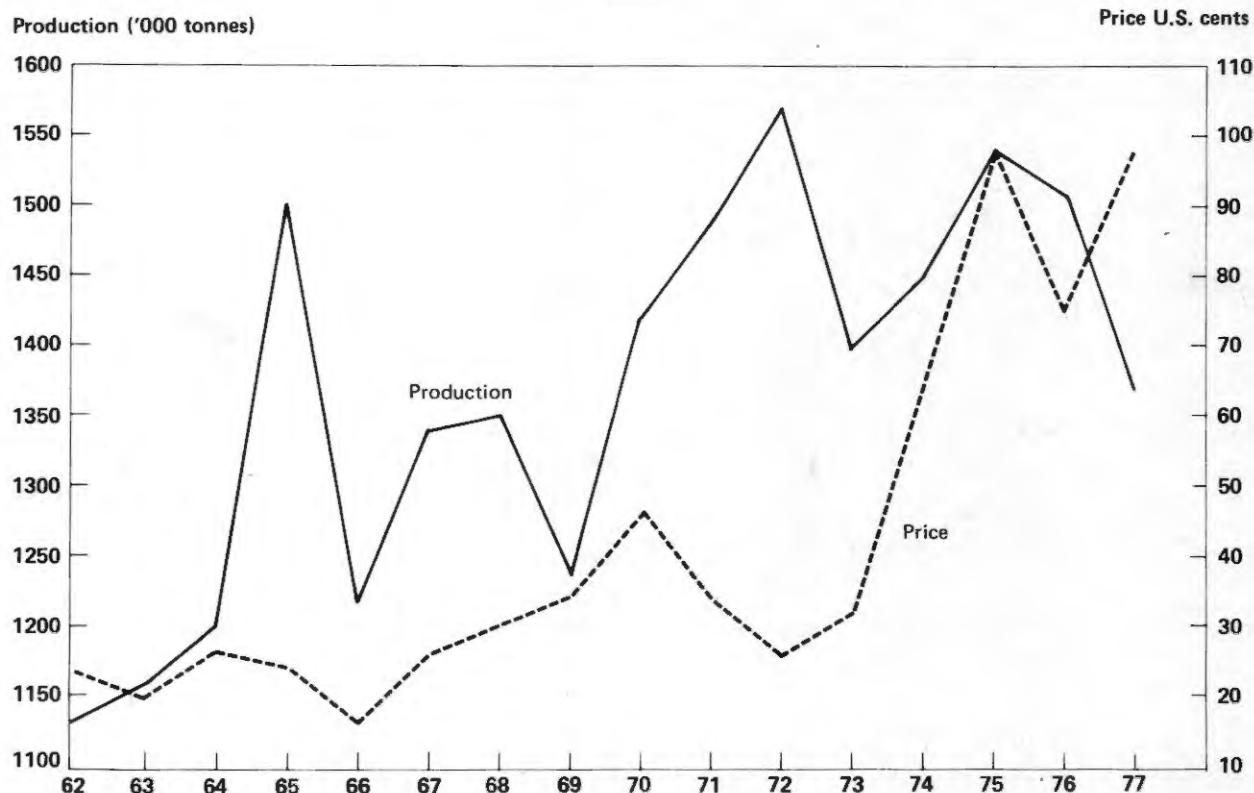
CHART 1



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## TABLE 1

**WORLD COCOA PRODUCTION IN THOUSANDS OF METRIC TONS AND THE FLUCTUATIONS AS A PERCENT OF BASE YEAR 1961-62 PRODUCTION**

| Year | Production ('000 Tons) | % Fluctuation in Production |
|------|------------------------|----------------------------|
| 1961-62 | 1123 | 3 |
| 1962-63 | 1162 | 10 |
| 1963-64 | 1238 | 10 |
| 1964-65 | 1490 | 32 |
| 1965-66 | 1219 | 10 |
| 1966-67 | 1336 | 18 |
| 1967-68 | 1349 | 20 |
| 1968-69 | 1237 | 10 |
| 1969-70 | 1433 | 28 |
| 1970-71 | 1380 | 23 |
| 1971-72 | 1572 | 40 |
| 1972-73 | 1399 | 24 |
| 1973-74 | 1447 | 29 |
| 1974-75 | 1544 | 37 |
| 1975-76 | 1510 | 34 |

Source: Adapted from FAO Commodity Year Book 1971, pp. 100 and extended to the most recent period by the author.

million tons—representing a growth of 26.4 percent or an annual average of 2.7 percent (see Table 2).

Cocoa price is subject to wide and irregular fluctuations. According to an IMF study (1973), cocoa trade is one of the most unstable commodities in the export trade of developing countries.[2] Using a fluctuation index based on the average annual deviations from the long-term trend, they found cocoa to be the most unstable of eight core export commodities, with a rating of 20 compared with 12 and 10 for sugar and coffee, respectively. The marketing of cocoa in the

## TABLE 2

**DATA ON WORLD COCOA ECONOMY**
**('000 metric tonnes unless otherwise stated)**

| Year[1] | Production (1) | Export (2) | Consumption (3) | Stockpile (4) | Price[4] (5) |
|---------|------------|-----------|------------------|---------------|------------|
| 1961-62 | 1131 | 1018 | 1107 | 465 | 22.6 |
| 1962-63 | 1158 | 1020 | 1146 | 489 | 21.0 |
| 1963-64 | 1202 | 1187 | 1180 | 487 | 25.3 |
| 1964-65 | 1490 | 1204 | 1179 | NA | 23.4 |
| 1965-66 | 1219 | 1108 | 1318 | NA | 17.2 |
| 1966-67 | 1336 | 1082 | 1367 | NA | 24.6 |
| 1967-68 | 1352 | 1057 | 1366 | 581 | 28.8 |
| 1968-69 | 1236 | 999 | 1390 | 572 | 34.4 |
| 1969-70 | 1424 | 1119 | 1353 | 433 | 45.8 |
| 1970-71 | 1493 | 1188 | 1357 | 498 | 34.1 |
| 1971-72 | 1572 | 1235 | 1438 | 565 | 26.8 |
| 1972-73 | 1399 | 1088 | 1566 | NA | 32.2 |
| 1973-74 | 1447 | 1160 | 1557 | 393 | 63.6 |
| 1974-75 | 1544 | NA | 1477 | 322 | 98.2 |
| 1975-76[3] | 1510 | NA | 1444 | 435 | 75.9 |
| 1976-77[2] | 1370 | NA | 1504 | 435 | 109.2 |

Source: Gill and Duffus and Bureau of Labor Statistics
1. Crop years are for the 12 months Oct. 1 to Sept. 30.
2. Forecast
3. Preliminary
4. Average spot cocoa bean price (ACCRA) in New York in cents per pound.

major producing countries is under the control of the government through commodity marketing boards. In Ghana, Nigeria, Sierra Leone, and Jamaica, cocoa is shipped and marketed by statutory marketing boards which purchase the entire output at predetermined fixed prices and collect taxes and other levies on the produce. In these countries the price paid to producers is fixed by the government usually well below the world market price with a view to accumulating surplus funds—to be used in cushioning farmers' income in lean years. This administered pricing of cocoa in the domestic market is said to isolate the farmer from the wide variation in world prices and thereby stabilize his income over a planning horizon. As matters turned out, such marketing board reserves were actually used to finance government capital expenditures contrary to the stated purpose. This fiscal role of commodity marketing boards proved very important in LDCs and may in part explain their enthusiasm in promoting international commodity agreements aimed at stabilizing prices and the revenue generated.

Private firms undertake the international marketing of cocoa and its distribution within the main consuming countries. These firms are either dealers who carry stocks to meet the needs of manufacturers or manufacturers who purchase cocoa directly from the producing countries. The main harvest season for Western African and Brazilian cocoa falls in late fall and early winter which means that purchases in the consuming countries must be made in advance of production by the manufacturer. Much of the trading in cocoa takes place in the futures market. Price quotations in the main futures markets are considered accurate indicators of the price level for most of the traded cocoa. Prices are determined mainly in the futures markets for New York and London. (See Table 3.)

Table 4 reports recent data on world supply and demand for cocoa which indicate that cocoa prices are determined not only by current output or export but also by stockpiles and the level of seasonal grinding. Producing countries normally dispose of all exportable supplies while stocks between

## TABLE 3

**PRICES OF INTERNATIONAL SIGNIFICANCE (ANNUAL)**

| Period | New York Spot Ghana[1] | Futures[2] U.S. Cents/lb. |
|--------|------------------------|---------------------------|
| 1965 | 17.3 | 16.1 |
| 1966 | 24.4 | 23.0 |
| 1967 | 29.1 | 26.3 |
| 1968 | 34.4 | 31.5 |
| 1969 | 45.5 | 39.5 |
| 1970 | 34.2 | 29.7 |
| 1971 | 26.8 | 24.0 |
| 1972 | 32.3 | 38.6 |
| 1973 | 64.5 | |

Source: Adapted from Cocoa Statistics, Vol. 16, Oct. 1973, F.A.O. Rome.
[1] The New York Spot Ghana prices are exwarehouse and are fixed daily by official committees.
[2] Average of the daily price of the nearest three future trading months on the New York Cocoa Exchange at noon.

TABLE 4

## WORLD COCOA SUPPLY AND DEMAND
### (metric tons '000's)

| Crop Year[1] | Stocks Oct. 1 | Net World Crop[2] | Total Availability | Seasonal | Closing Stock | Stock Change |
|---|---|---|---|---|---|---|
| 1967-8 | 581 | 1320 | 1901 | 1384 | 517 | − 64 |
| 1968-9[5] | 572 | 1230 | 1802 | 1369 | 433 | −139 |
| 1969-70 | 433 | 1421 | 1854 | 1356 | 498 | + 65 |
| 1970-1 | 498 | 1483 | 1981 | 1416 | 565 | + 67 |
| 1971-2 | 565 | 1566 | 2131 | 1516 | 615 | + 50 |
| 1972-3 | 617 | 1384 | 2001 | 1605 | 396 | −221 |
| 1973-4 | 393 | 1433 | 1826 | 1504 | 322 | − 71 |
| 1974-5 | 322 | 1529 | 1851 | 1416 | 435 | +113 |
| 1975-6[3] | 435 | 1495 | 1930 | 1495 | 435 | 0 |
| 1976-7[4] | 435 | 1356 | 1791 | 1437 | 354 | − 81 |

Source: Gill and Duffus, Ltd.

[1] Crop year season is Oct.-Sept.

[2] Obtained by adjusting the gross world crop for 1% loss in weight

[3] Preliminary

[4] Forecast

[5] Data prior to 1968-9 are in thousands of long tons: source: Gill and Duffus, Ltd.

## TABLE 5

### COCOA PRICE CHANGES 1954 TO 1965

| | Monthly Average | | Annual Average U.S. Cents/lb. |
|---|---|---|---|
| | High U.S. Cents/lb. | Low U.S. Cents/lb. | |
| First decline 1954-56 | | | |
| 1954 | 68.9 (July) | 47.1 (Oct) | 57.8 |
| 1955 | 49.5 (Jan) | 32.6 (Aug) | 37.5 |
| 1956 | 29.5 (Jan) | 25.8 (April) | 27.3 |
| Recovery 1957-1958 | | | |
| 1957 | 41.6 (Nov) | 22.5 (March) | 30.6 |
| 1958 | 48.9 (June) | 38.8 (Oct) | 44.3 |
| Second Decline 1959-62 | | | |
| 1959 | 38.7 (March) | 31.4 (Dec) | 36.6 |
| 1960 | 30.0 (Jan) | 25.6 (Dec) | 28.4 |
| 1961 | 26.2 (Dec) | 20.6 (March) | 22.6 |
| 1962 | 23.0 (Jan) | 20.1 (Feb) | 21.0 |
| Recovery 1963 | | | |
| 1963 | 28.1 (May) | 22.9 (Jan) | 25.3 |
| Third Decline 1964-65 | | | |
| 1964 | 25.7 (Jan) | 22.2 (April) | 23.4 |
| 1965 | 23.0 (Jan) | 12.2 (July) | 17.6 |

Note: This table uses calendar years as a basis rather than crop years (October-September)

Classification is based on the average annual figures.

Source—*Journal of World Trade Law* Vol. 2. 1968, pp. 528.

years are held largely by manufacturers in importing countries. As a result seasonal variations in crops have had a greater impact on price formation than they might have been had producers withheld some supplies between cocoa seasons. For instance, in 1964-65 a world record production level caused prices to fall to exceptionally low levels in 1965-66. Most countries reacted either by curtailing production or by abandoning planned improvements. (See Table 5 and Chart 1 for some indication of fluctuations in cocoa prices.) In general, prices of cocoa are said to vary inversely with the level of stocks held. To sum up, the wide variations in world supply coupled with a relatively inelastic demand cause the price of cocoa to be more unstable than that of almost any other commodity exported by the LDCs.

## Part II

### THE EVOLUTION OF INTERNATIONAL COCOA AGREEMENT (ICA)

The rise of international commodity agreements may be viewed within the overall perspective of the New International Economic Order (NIEO), a course championed by the

LDCs. The NIEO idea which surfaced at the United Nations Conference on Trade and Development (UNCTAD I, 1964), represents an expression of the desire of the LDCs to exercise increasing participation in the forces shaping their economy. It is concerned with means to obtain broadly defined objectives of which commodity agreement forms an important aspect.[3] As shown in the analysis of the preceding section, cocoa is produced in the LDCs and consumed in the industrialized countries. Furthermore, the forces determining its world price may be largely traceable to middlemen speculative activities in the consuming countries. It is therefore not surprising that cocoa should be considered one of the candidates for an international agreement designed to ensure that the actors on both sides of the market exercise a balance of economic power.

After several years spanning over a decade of preparatory work, the draft of ICA was finally adopted in October 1972 to cover a period of three years. It officially came into operation on June 30, 1973 and was renewed with no major alterations in 1975. However, it may be pointed out here that it has not had any operational experience to its record. Before subjecting it to a critical analysis, it is illuminating to review the activities and conferences which culminated in the agreement.

Three international conferences (1963, 1966 and 1967) and a number of intensive consultations among interested parties under the supervision of Prebisch (Secretary General of UNCTAD) are worth noting. The search for an international cocoa agreement may actually be considered to have started in 1956 when the United Nations Food and Agricultural Organization established a cocoa study group composed of producers and consumers. They met intermittently to discuss the possibility of a cocoa agreement to stabilize world prices. Discussions subsequently moved to the sponsorship of UNCTAD.

The first UNCTAD cocoa conference (1963) was convened to implement the recommendation of the FAO Study Group, "to consider the international measures designed to meet the special difficulties which existed or were expected to arise concerning cocoa and the preparation of an international agreement embodying international measures considered desirable."[4] The conference adjourned without reaching any agreement but set up a working party on prices and quotas. From mid-1965 to early 1966 the working party held four sessions and expressed strong optimism about the possibility of obtaining an international agreement at another cocoa conference. The next international cocoa conference met for a month (May 23-June 23, 1966) but failed to reach agreement and called for more preparatory work. In a statement to the conference the Secretary General of UNCTAD identified a number of factors constituting the stumbling blocks in the way of agreement.[5] They were connected mainly with the determination of the size and operating guidelines and finance of the buffer stock.

Following the conventional approach some people advocated a buffer stock that would intervene in the market in a symmetrical way, i.e., sell cocoa from stock when current price penetrates the ceiling and stockpile when price drops below the floor. The alternative view was to maintain a buffer stock as a reserve stock and intervene asymmetrically by buying the surplus cocoa in the hands of the producers at the end of a crop season in which the market price was above the ceiling. The second problem that was still to be resolved was the need to set up a permanent arrangement to ensure a steady flow of earnings to operate buffer stock and finance storage expenses. Thirdly, the task of setting up an appropriate band of fluctuation for cocoa prices proved, not unexpectedly, problematic. Some suggested fixing the range for the quota year while others wanted the range to operate for the first three years before adjustment. Suggestions in this connection also included using the method of the coffee agreement which does not have a fixed range but relies on preventing price from falling below a certain level. There was also the debate as to whether sales or export quotas should be used in the stabilization arrangement.

To pursue the resolution of these problems the Secretary General of UNCTAD arranged a series of multilateral consultations in which he obtained the consent of fourteen countries to adopt a memorandum of agreement concerning prices or other important matters including the reconvention of cocoa conference. The November 1967 cocoa conference met and adjourned without securing any agreement. Between 1968 and 1969 two important meetings carried on the efforts at securing ICA. A Cocoa Consultative Group met to consider the outstanding issues of the draft (June 1968). This was followed by a meeting of a Technical Preparatory Committee (1969) to review certain articles of the draft agreement. Further progress was made in 1970-71 through series of consultative group meetings to secure agreement on a number of important issues including a proposal to appoint a negotiating committee to prepare a draft of ICA for adoption at the next conference. The 1972 conference was first convened in March but could only establish a negotiating committee to seek to resolve the divergences of views on outstanding issues and produce an agreed draft texts of the relevant articles to be presented to the reconvened conference.[4] The conference reconvened in September and adopted in October the texts of the first ICA covering a period of three years. The agreement was renewed with minor modifications in 1975.

## Part III

## THE MAIN ECONOMIC PROVISIONS OF ICA

Objectives:

The objectives of the Agreement are stated as follows:[6]

(a) To alleviate serious economic difficulties which would persist if adjustment between the production and consumption of cocoa cannot be effected by normal market forces alone as rapidly as circumstances require;

(b) to prevent excessive fluctuations in the price of cocoa which affect adversely the long-term interests of both producers and consumers;

(c) to make arrangements which will help stabilize and increase the export earnings from cocoa of producing countries thereby helping to provide such countries with resources for accelerated economic growth and social development, while at the same time taking into account the interests of consumers in importing countries;

(d) to assure adequate supplies at reasonable prices, equitable to producers and consumers; and

(e) to facilitate expansion of consumption and, if necessary, and insofar as possible, an adjustment of production, so as to secure an equilibrium in the long term between supply and demand.

Although these objectives are highly general and in many respects vague, they clearly indicate a belief in the imperfect market structure for cocoa, coupled with a religious faith in the power of price and income stabilization scheme to work economic miracles for the producers as well as consumers. Like the tin, and other similar agreements, the cocoa agreement relies on the use of two primary policy instruments—a buffer stock arrangement and an export quotas system. To operate the buffer stock, a price range, within which prices may fluctuate freely without any intervention with the market forces, was established.

The Agreement provides for the setting of basic quotas for the contracting exporting members. A member's basic quota is proportional to its annual average share of the group average production taken over the preceding five crop years. Members producing less than 10,000 tons of bulk cocoa are not subject to quotas. An International Cocoa Council (ICC) established under the Agreement is charged with the responsibility for determining the annual export quotas for the nine major producers taking into account each member's basic quota, and the estimate of world demand. The export quotas are set with the aim of maintaining price fluctuation within the agreed band. They are proportional to the basic quotas. (See Table 6 for the basic quotas allocations under the 1972 and 1975 Agreements.)

### TABLE 6
### ALLOCATION OF BASIC QUOTAS

| Exporting Countries | 1972 Agreement | | 1975 Agreement | |
| --- | --- | --- | --- | --- |
| | Production (000 Tons) | Basic Quotas % | Production (000 tons) | Basic Quotas % |
| Ghana | 580.9 | 36.7 | 409.8 | 32.5 |
| Nigeria | 307.8 | 19.5 | 247.7 | 19.6 |
| Ivory Coast | 224.0 | 14.2 | 196.3 | 15.5 |
| Brazil | 200.6 | 12.7 | 189.7 | 15.0 |
| Cameroon | 126.0 | 8.0 | 112.0 | 8.9 |
| Dominican Republic | 47.0 | 3.0 | 37.1 | 2.9 |
| Equatorial Guinea | 38.7 | 2.4 | 27.3 | 2.2 |
| Togo | 28.0 | 1.8 | 23.1 | 1.8 |
| Mexico | 27.0 | 1.7 | 19.6 | 1.6 |
| Total | 1580.0 | 100.0 | 1262.6 | 100.0 |

Source: UN Conference on Trade and Development, UN Cocoa Conference, 1972, 1975

Both the 1972 and 1975 agreements established a buffer stock capacity of 250,000 tons of cocoa beans to be operated by a buffer stock manager (BSM) in accordance with rules established by the ICC. Buffer stock purchases are to be made only from producing countries subject to export quotas. Any reduction in producer countries export quotas is to be taken up by BSM.

Under the agreement, an indicator price designed to play an important role in the operation of the buffer stock and in the determination of annual export quotas was defined to equal the average daily prices* recorded for a period of 15 consecutive market days. The price range for cocoa bean under the 1972 Agreement was U.S. 23¢-32¢ per lb. This was revised to the range of U.S. 39¢-55¢ per lb. in the 1975 Agreement. These prices were subject to revision either annually or when "upheavals in the international economic and monetary situation" warranted it. Such revisions are to be based on the trend of cocoa prices, consumption, production, stockpiles or other relevant factors.

Rules for operating the annual export quotas as well as the buffer stock are tied to specified relationships between the indicator price, and the floor and ceiling prices in operation at the given point in time. (See Appendix 1 for illustration of the formulae using the price range in the 1975 ICA.) Following the rules, the export quota is either left unchanged, or slightly reduced or suspended depending upon whether the indicator price is in the middle of the price range, or closer to the floor or to the ceiling, respectively. The clear indication is that quotas are automatically suspended when the price lies above the ceiling. The guidelines for operating the buffer stock requires the manager to buy cocoa beans when the indicator price is close to or below the floor price and sell when prices are fluctuating around the ceiling.

### Part IV

### AN ECONOMIC ANALYSIS OF THE IMPACT OF PRICE STABILIZATION

This section gives a simple and general theoretical economic analysis of the price stabilization scheme embodied in the ICA and similar arrangements.[7] The traditional approach generally regards the market for internationally traded primary commodities as approximating pure competition in which both producers and consumers are price takers. The neoclassical comparative static economic framework has demonstrated that pareto efficient allocation of resources is best guaranteed in a world characterized by perfect competition. Following such a framework it could be demonstrated that in a world with the correct initial distribution of assets for a given social welfare function with easy entry, absence of externalities and uncertainty, and pure competition everywhere, pure competition in international commodity markets

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,*Daily price is defined as average taken daily of the quotations for cocoa beans of the nearest three active future trading months on the NY Cocoa Exchange at noon and London Cocoa Terminal Market at closing time.

results in maximization of that social welfare function. It requires only a little stretch of the imagination to realize that the reality is far from being replicated by such hypothetical equilibrium framework. If we take into consideration the speculative activities of private middlemen, marketing boards or other quasi-government agencies, it may be difficult to treat the world cocoa market with a perfectly competitive model. Thus, at least, in principle it may be easy to justify some intervention in the world market for cocoa. The theory of the "second best" or "third best" may be summoned to support the need for commodity agreements to regulate the marketing of the core primary commodities traded internationally. The analysis that follows is designed to shed light on the two interrelated questions, namely, (a) What implication does price stabilization have for the export earnings of the producing countries? and (b) Who gains from price stabilization?

In response to the first question, it can be demonstrated that under certain conditions, the impact of price stabilization programs suggest a tradeoff between the level and the stability in revenue, but this is by no means the only possibility.

Consider Figures 1-3 below. Figures 1 and 2 deal with a situation where both supply and demand curves are elastic.

**FIGURE 1**
(Elastic supply and demand curves but shock from demand shift)
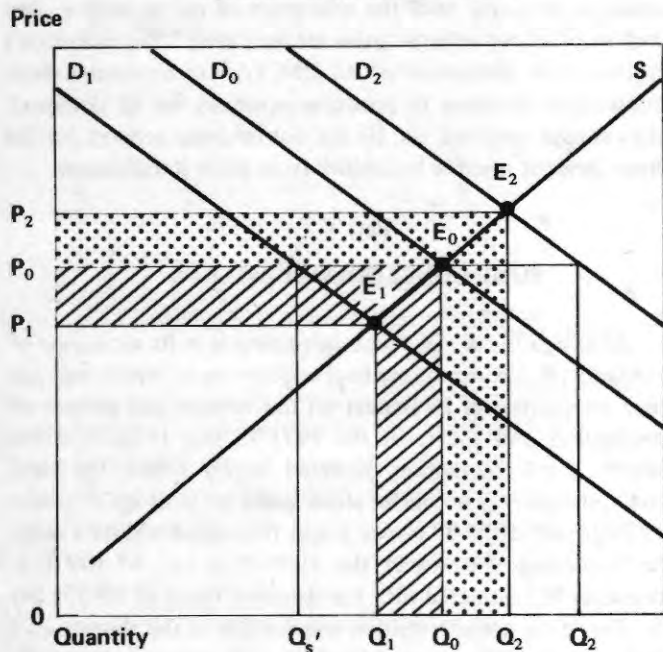
Price



To stabilize at $P_0$ BSM buys $Q_s' Q_0$ when $D_1$ and sells $Q_s 2 Q_0$ when $D_2$



gain
loss } {from} Price stabilization

$$\boxed{} > \boxed{} \Rightarrow$$ stabilization lowers producers average revenue

Average revenue without price stabilization is $(P_1 Q_1 + P_2 Q_2)/2$

Revenue from stabilization $P_0 Q_0$    $(P_1 Q_1 + P_2 Q_2)/2 > P_0 Q_0$

**FIGURE 2**
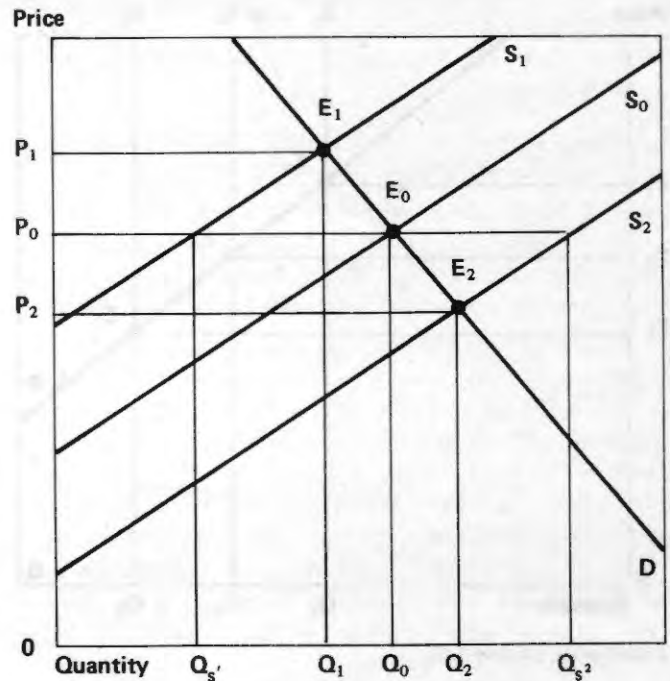(Elastic curves with shock from supply shifts)

Price



Figure indicates that stabilization of prices at $P_0$ raises average revenue but destabilizes it.

When $S_1$ producers' revenue is $P_1 Q_1$
When $S_2$ producers' revenue is $P_2 Q_2$
without stabilization.

With stabilization at $P_0$, revenue is $P_0 Q_0$ and when $S_1$, BSM sells $Q_s' Q_0$ and buys $Q_s 2 Q_0$ when $S_2$; producers sell $P_0 Q_0$ and gets $(Q_0 Q_{s^2})P$ from selling to buffer stock when $S_2$. His average revenue from stabilization is

$$[(0Q_s')P_0 + (0Q_{s^2})P_0]/2 > ((0Q_1)P_1 + (0Q_2)P_2)/2$$

and also fluctuates more.

In one, the source of price swing is demand shift and illustrates the case where price stabilization results in stable but lower average income for the producing countries. In Figure 2, price fluctuation is assumed to be associated with changes in supply curves and shows that buffer stock operation could destabilize producer's income while at the same time yield a higher average income than in the absence of such intervention. Figure 3 models a situation of zero-elastic supply confronting inelastic demand and indicates that price stabilization raises revenue as well as stabilizes it.

The main lesson from the above analysis is that the impact of stabilization on producing countries' revenue cannot be settled on theoretical grounds. For instance, if producers are sufficiently risk averse, and supply is highly inelastic, then they are better off with price stabilization than without it. Thus the issue is an empirical one and depends largely on the size of the relevant elasticities. As pointed out by Behrman "without empirical knowledge concerning long-run movements, the shapes of the [demand and supply] curves, risk aversion, the demand and supply elasticities of price

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**FIGURE 3**
(Zero elastic supply and inelastic demand
with shock from supply shift)

**FIGURE 3**
(Zero elastic supply and inelastic demand
with shock from supply shift)
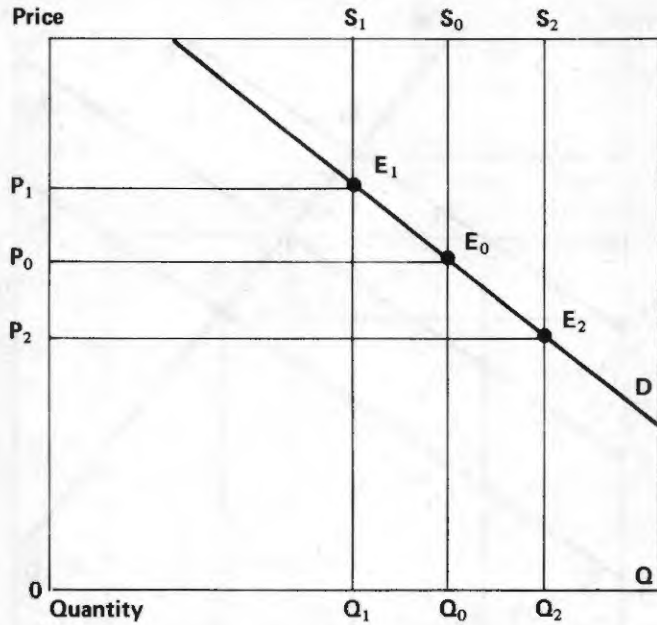
Stabilization income $P_0 Q_0$

Average income, no stabilization is $(0Q_1 P_1 E_1 + 0Q_2 E_2 P_2)$

$/2 < 0Q_0 E_0 P_0$

⇒ Stabilization raises revenue as well as stabilizes.

responsiveness, the causes of shifts, whether the movements in supply and demand curves are additive or multiplicative, etc., we cannot state with assurance what the impacts of stabilization are."[7]

The question who gains from price stabilization is related to the one examined above. The simplest approach focuses on producers' and consumers' surpluses and the financial gains from operating a buffer stock. Figure 4 illustrates a simple case where buffer stock operation is assumed to have no storage cost.

When supply curve shifts to $Q_1$ buffer stocks are accumulated. Consumers lose by paying $P_0$ instead of the lower $P_1$; this amounts to area A + B + C. Producers gain area A + B + C + D. Buffer stock pays for area C + D + E. Overall result (loss) is area C + E. When the supply curve shifts into $Q_2$, stocks are sold at $P_0$. Consumers gain area F + G. The producer loses area F. The financial flow to the buffer stock is H + B. The total benefit is G + G + H. Assuming shifts in the supply curve to $Q_1$ and $Q_2$ are equally likely. The total benefit to each of the group is the sum of those obtained from buffer stock operation with supply at $Q_1$ and $Q_2$. For consumers, the sum is F + G - A - B - C. For producers the sum is A + B + C + D - F. For the buffer stock, the sum is B + H - C - D - E. The total benefit is represented by B + G + H - C - E. Under these assumptions the sum for the buffer stock is zero and the overall sum is positive.

The conclusion which appears obvious from the above discussion is that producer's benefit depends on the exact



**FIGURE 4**
Gains and Losses From Price Stabilization
(shifts in Inelastic Supply Curve Only)
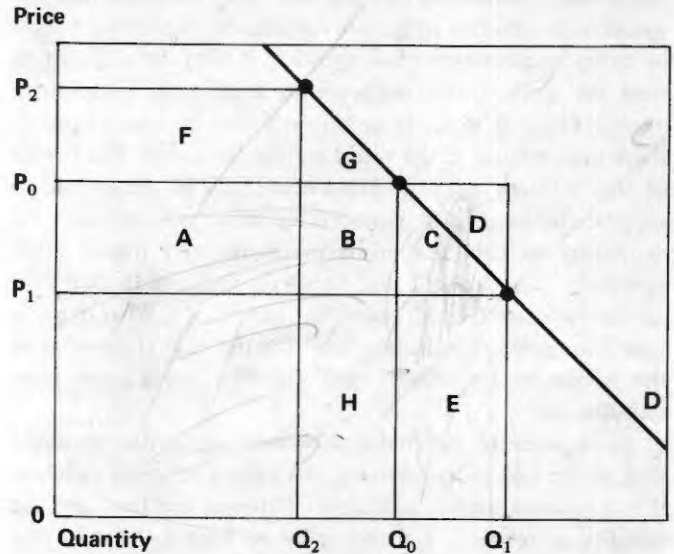
shape of the demand and supply curves which makes the issue again basically an empirical one.

A world bank simulation experiment, using linear supply, demand and additive disturbance assumptions found stabilization would lose LDC's export revenue across a large spectrum of products with the exception of cocoa, coffee, jute and wool where revenue gains are indicated.[8] But Behrman's buffer stock simulation of 13 UNCTAD commodities show substantial increases in producer revenues for all commodities except sisal and tin. He did not find any support for the hypothesized revenue instability from price stabilization.

## Part V

## SOME CONCLUDING REMARKS

Although the world cocoa agreement is in its sixth year of existence, it has no operational experience on which one can base an analysis of its impact on the volume and pattern of production and trade. In the 1971-72 and 1972-73 cocoa season, price fluctuation occurred largely within the band and consequently no buffer stock could be built up. Between 1973-74 and 1976-77 cocoa prices fluctuated within a range far exceeding that set in the 1975 ICA, i.e., 67-109 U.S. cents per lb. compared with the specified range of 39-55¢ per lb. Therefore no intervention was feasible in the absence of a buffer stock. Thus even though the agreement is being observed in principle it has absolutely no impact so far on world cocoa trade.

With regard to the future of the arrangement, it is difficult to see what significant role the ICA can play in stabilizing cocoa prices although in principle it could stabilize and raise producers average income as the analysis in section four indicated. However the evidence is far from conclusive. Commodity agreements, even if they succeed in stabilizing prices, may not always result in a higher average income for the

producers. And more importantly, the welfare effects on producers, consumers and the buffer stock management have been shown to depend on unobservable elasticities of demand and supply. Under such circumstances an objective evaluation of the likely impact of ICA is bound to be conjectural. As of now there appears no hope of building up a buffer stock in the near future. The export quota would remain under indefinite suspension as long as the recent cocoa price strength is maintained. The conclusion is therefore inescapable that the cocoa commodity scheme would continue to exist on paper until a sizeable surplus emerges to enable the buffer stock manager to acquire some stockpile with which to initiate its operational life as the need arises. The experience of the older commodity schemes cast doubt on their effectiveness. The long drawn out period of evolution of ICA more than ever affirms the nontrivial and tedious process of negotiating commodity agreements involving a great deal of political compromise. If the gains are not so obvious, then one might legitimately ask whether it is worthwhile to take such trouble. No satisfactory answer seems to be forthcoming in response to the question what prices should be defended by buffer shock operations. Costs may differ substantially among the producers. The long run equilibrium price is operationally an elusive concept and hence no price can be easily found to compel acceptance by all members. There is an ever-present conflict between consumers and producers in the critical decision areas necessary to draw up an operational and workable agreement. The problem of enforcing compliance cannot by any means be minimized. While I do not intend to sound condemnatory of commodity agreements, the above observations are intended to suggest that the case for commodity agreements appear to require a case by case treatment and more importantly that their rationale might be substantially noneconomic.

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## APPENDIX

**Operating guidelines for quotas and buffer stock.**

Price range under the 1975 ICA: 39-55 U.S.$\cent$/lb.

### QUOTAS

(1) If $P_I > 45\cent$ per lb.
and/or $\{\overline{\lessgtr}\}47\cent$ per lb. $\Rightarrow P_I = 45 - 47\cent$
The X quota should remain unchanged.

(2) If $P_I > 42$ U.S.$\cent$/ lb.
$\{\overline{\lessgtr}\}$ 45 U.S.$\cent$/ lb. $\Rightarrow P_I = 45 - 45\cent$
$\Rightarrow$ X Quota should be .97 (initial allocation)

(3) If $P_I > 47\cent$/lb. i.e., even before the ceiling price is reached $\Rightarrow$ suspend X quota.

**Buffer Stock Operation**

(a) If $P_I = 39 - 42\cent$/lb.
$\Rightarrow$ BSM buy cocoa beans up to .04 (X quota) at current market price.

(b) If $P_I < 39\cent$/lb. $\Rightarrow$ BSM buy cocoa until $P_I\uparrow$ above $P_m$ or until stock capacity it reached, whichever is earlier.

(c) If $P_I > 53\cent$/lb.
$\{\overline{\lessgtr}\}55\cent$/lb. i.e., $P_I = 53 - 55\cent$
$\Rightarrow$ BSM sell .07 (X quota) until $P_I$ rises above $P_m$ by $14\cent$ or stock is exhausted whichever is earlier.

(d) If $P_I > 55\cent$/lb. i.e., $P_I > P_m$
$\Rightarrow$ BSM sell cocoa until $P_I = P_m$ or stock is exhausted, whichever is earlier.

**Legend**

$P_I$ = Indicator Price
X quota = Export quota
$P_m$ = Ceiling Price
BSM = Buffer Stock Manager