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COLOMBIA, GUATEMALA AND COSTA RICA:

CARIBBEAN BASIN COFFEE PRODUCER COUNTRIES

(Final report)

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Introduction

Arabica is a variety of coffee grown mainly in America with very specific ecologic requirements. In natural conditions, this species is grown in the Ethiopian mountains between 1300 and 2000 mts above sea level. It requires for its adequate development an annual temperature of average 18-25° Celsius, with a minimum of 13°C. This determines its localization, although sometimes altitude can be compensated with latitude. In the Equator, for example, coffee is grown in altitudes of 2500mt, whilst in the Brazilian Parana a temperature of 24° can be found at 100-200mts above sea level.

As a species, coffee requires a very humid type of soil with precipitation levels between 1500 mm per year, distributed regularly, but with a non rainy period of 2-3 months in which the fruit matures. The structure and texture of the soils ought to be well drained and adequate to retain humidity, and with a high content of organic materials and acidity of approximately PH6.

1/ The final version of Chapters II and III of this work were elaborated based on documents elaborated by Maria Errázuriz specially for this study.

Colombia, Costa Rica and Guatmala all produce this Arabica variety of coffee. In the first case, the coffee is characterized as "Colombian Milds" in the international market and as "Other Milds" in the second and third case. These three countries are crossed by the Andean Mountain System with great variety of ecologic conditions.

In Colombia, optimal conditions for coffee growing are between 900 and 1800 mts. The coffee producing geographic regions are characterized by a 23°C temperature and small variations between day and night, with a regular distribution of rain and very high levels relative humidity, all fundamental factors of coffee growing development. The best soil conditions in the Colombian coffee regions are given by their volcanic nature. Nevertheless, because these regions are situated basically in mountainous terrain, it is very difficult to mechanize the basic production processes.

In Costa Rica coffee is grown in middle temperature regions with an altitude of 600 to 1500 mts above sea level, and temperatures ranging between 16 and 20° Celsius. In higher altitudes there is a probable danger of frosts, and below, flowering is not as efficient. One of the main differences of these conditions with the ones that prevail in Colombia, is that the non rainy season is longer and sometimes artificial irrigation is needed. Soils are also of volcanic nature with a very high

concentration of organic materials. Mountain farms are not as steep.

Guatemalan coffee areas are localized in the south part of the Sierra Madre and Verapaz, in regions ecologically characterized as and extra-humid and humid subtropical forest in the lower part of the mountain areas. In this country, given the different climatic conditions with respect to Colombia and Costa Rica most coffee is grown under shadow at 300 to 1500 altitude. As in the case of Colombia and Costa Rica, soils are of volcanic nature, and offer very good conditions for development of coffee production.

The study is divided in five different chapters each of them containing the principal aspects of the coffee sector of the countries considered in this analysis. In the first chapter a brief history of the coffee sector and the importance of coffee in the economies of these nations are dicussed. The second chapter describes the marketing chains and the institutional framework of the coffee sector in each of these countries. The third chapter analyzes all aspects of the coffee production systems, including production modes, employment, supply and production policies. Chapter four lloks at the different aspects of the role played by the three countries in the international coffee market, specially looking at the evolution of exports, carryover stocks, prices and positions at International Coffee Agreement negotiations. Finally,

in the last chapter, the principal aspects of the study are summarized and the principal conclusions are presented.

CHAPTER I. THE IMPORTANCE OF COFFEE

In all three countries considered in this analysis, coffee has played a very important role in the colonization of agriculture frontiers since the end ol past century and, as a result, of the structure of the whole economy and its external sector.

A. GUATEMALA

1. A brief history of the coffee sector

In Guatemala, the basic conditions for the expansion of coffee production were given at the end of the past century when some policies oriented to transform the structure of land ownership were promulgated by the authorities. Lands owned by religious authorities was expropiated, the Censo Enfiteútico was abolished, and a very aggresive strategy towards allocating public land was carried out. These three measures implied a multiplication of the private-owned land. At the same time, there was a chronic shortage of labour in the country, so the authorities permitted the use of indigenous labour with reppresive methods in coffee exploitations. These regulations prevailed until 1940 and provided cheap labour for coffee production. As it will be analyzed later, this was one of the main differences between Guatemala and Costa Rica and Colombia.

During the period when the coffee sector was expanding, there were significative flows of European immigrants. They purchased a great part of the land available for coffee plantation, specially during the 1920s. These immigrants had a very close relationship with German banks in Hamburg and Bremen, and this made access to external credit for coffee growing easier. In 1923 German immigrants owned 10 percent of coffee farms and produced almost 40 percent of the total volume of coffee produced in Guatemala, revealing a clear technological advantage in the use of coffee plants and mills [2/].

In comparison with Colombia and Costa Rica, the development of the Guatemalan coffee sector has not been as dynamic in recent years. Between 1960 and 1985 the area planted increased in 73,000 hectares, but without any productivity growth.

2. The Importance of Coffee in the Economy

Traditionally coffee in Guatemala has been the most important single export product, accounting for more than 30 percent of total exports. The second export product are bananas, but their share in total export revenues is only 7 percent. When prices in the international coffee market have risen significantly, the participation of the value of these exports has increased over 45

2/ Cardoso ().

percent (see Table 1-1). In 1989, as a result of the dramatic fall in international prices, coffee export revenues fell to 28 percent.

Another variable that shows the relative weight of coffee in the Guatemalan economy is the share of coffee taxes in total tax revenues. As it can be seen in Table 1, until 1973 these represented between 5 and 7.1 percent of total revenues. This participation rose significantly in the years when coffee international prices increased: between 1976 and 1981 these coffee taxes were on average 17 percent of total tax revenues in Guatemala. When quotas were reestablished in 1981, these shares diminished strongly so that in 1985 they represented less than 5.5 percent. The salient feature of this behaviour are the wide fluctuations of the fiscal revenues in response to the movements of international coffee prices. This of course means that the Guatemalan economy is subject to the instability of international coffee prices, given that a great part of its public spending capacity is determined by their fluctuations. The trend of Guatemalan authorities to increase export taxes whenever international coffee prices rice, is also reflected in these figures. In 1989 due to the collapse of the International Coffee Agreement, the Guatemalan authorities decided to eliminate all taxes on coffee. Only the 1% export tax to finance the National Association of Coffee Growers (ANACAFE) was maintained.

TABLE 1-1 GUATEMALA: THE IMPORTANCE OF COFFEE IN THE ECONOMY, 1970-89

Years	% Total Tax revenues	% Total Exports	% GNP
1970	5.7	34.7	22.3
1971	4.9	33.6	21.8
1972	4.8	31.3	22.5
1973	7.1	32.9	22.9
1974	7.9	29.7	23.8
1975	2.6	25.6	23.7
1976	10.4	31.0	23.0
1977	25.3	45.4	23.5
1978	23.7	43.5	22.5
1979	18.5	34.8	21.9
1980	19.4	30.5	19.8
1981	6.5	25.2	20.1
1982	5.7	32.0	20.3
1983	4.8	28.3	20.6
1984	4.4	31.8	20.9
1985	1.1	42.6	20.7
1986	12.0	48.1	20.3
1987	6.0	36.2	19.7
1988	4.0	37.8	19.9
1989	0.2	28.5	18.5

Source: Mc Sweeney (1988), p.p. 28

B. COSTA RICA

1. A brief history of the coffee sector

In Costa Rica, since national independence until now, coffee and bananas have been the principal exports. Coffee is grown in densely populated areas of the Andean Central Valley. In turn, banana plantations are localized in coastal plains in extense territories exploited by multinational companies.

Between 1880 and 1935 there was a significative expansion of agricultural production in the Central Valley given that it was the only region that had an adequate transport infrastructure. It was after the 1930's that coffee production expanded to other regions (Nicoya, San Carlos, Sarapiqui and General valley), as a result of the building of motorways and the installation of coffee mills [3/].

Medium and small exploitations have dominated the coffee sector since the 1930s. The sectors's land ownership is based on the private appropriation of public lands sold afterwards to those who cleared them. Since beginning of the present century there has been a process of land concentration resulting in bigger farms and with the subsequent process of proletarization of the labour force

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3/ Casdyn (1976).

in certain regions. Also since the 1930's there has been a clear separation between producers and mill owners [4/].

Between 1930 and 1950 production and cultivated areas remained stable, specially as a result of the Great Depression in the U.S. and the Second World War. After 1950 the area under cultivation increased substantially and the productivity of labour doubled. From 1960 onwards new plantation techniques were introduced and the varieties of coffee were gradually replaced with native hybrids and finally by the Caturra. The principal technological changes were the increase in the density of cultivation, the use of fertilizers and the intensification of other cultivation practices.

2. The Importance of Coffee in the Economy

Coffee in Costa Rica represented an average 30 percent of total export revenues in the period 1970-89. An interesting feature is that the variations of this proportion have been small over the period analyzed. These variations are related with the periods of rise and fall of international coffee prices, as in the case of Guatemala.

4/ Selligson (no date).

TABLE 1-2 COSTA RICA: THE IMPORTANCE OF COFFEE IN THE ECONOMY, 1970-89

Years	% Total Tax revenues	% Total Exports	% GNP
1970	n.a.	31.6	n.a.
1971	.	26.3	.
1972	.	27.7	.
1973	.	27.3	.
1974	.	28.3	.
1975	.	19.7	.
1976	.	26.0	20.1
1977	.	38.6	21.8
1978	.	36.5	20.4
1979	.	33.8	19.7
1980	.	24.2	19.9
1981	.	23.7	18.4
1982	.	27.0	17.7
1983	7.6	26.2	15.3
1984	7.5	26.6	12.8
1985	7.3	32.0	12.6
1986	12.0	34.8	9.4
1987	9.0	33.9	6.3
1988	7.6	30.0	5.0
1989	7.2	27.4	4.8

Source: Jaramillo (1989) p.p. 9 and IMF, International Financial Statistics, several issues. Jimenez (1978) p.p.6. Calculations by the author.

The multitude of coffee taxes that exist in Costa Rica [5/] represent aroud 7 to 12 percent of total tax revenues. These percentages have increased whenever international prices overshoot, but in a less significative way than in the case of Guatemala. This, together with the relative low share of coffee in exports, means that the Costa Rican economy is not as subject to the volatility of international coffee prices as other Central American nations and specially Guatemala.

On the other hand, coffee production represents about 5 points of the GNP. In 1976, however, this proportion was much higher: 20.1 percent. It decreased steadily, specially during the 80's, reflecting a tendency towards diversification of the Costa Rican productive structure.

In 1989, Costa Rican authorities decided to eliminate an important number of coffee taxes as a result of the collapse of the International Coffee Agreement (ICA). This meant a sustantial reduction of the share of coffee taxes in total tax revenue. Also coffee export revenues as a proportion of total export revenues fell significantly, eventhough Costa Rican authorities placed increasing quantities of coffee in the international market. The share of coffee in the GNP also fell, but in a less dramatic way,

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5/ All coffee taxes are fully described in Chapters II and III.

given the relative inflexibility of coffee production in the very short run.

C. COLOMBIA

1. A brief history of the coffee sector

Since 1905 coffee exports in Colombia represented more than 500 thousand bags. These exports increased to one million bags in the 1920s. Fron then onwards coffee represented more than 50 percent of total export revenues.

The first plantations of coffee were established in the eastern part of the country in the regions of Santander and later in the east of Antioquia. In its first stages of development, until 1875, almost 90 percent of coffee production originated in the Santander regions. At the beginning of the century, there was a significative change in the geographic localization of coffee production: Antioquia and Caldas, very active areas of colonization of public lands, became the first coffee production regions at the expense of Santander. These changes were accompanied with a modification in the production conditions, from bigger exploitations (haciendas) to smaller farms. Between 1926 and 1932, for example, the latter type of exploitation increased in number by more than 249 percent [6/].

6/ See Machado (1977).

The dynamism of coffee production in Colombia from 1925 onwards was very different from that in Costa Rica. From that year to 1945 production increased by an annual rate of 4.5 percent, thanks almost exclusively to the increase in the area under cultivation. Between 1950 and 1970 production rell by an annual rate of 1.7 percent. This contraction was due to a reduction of new plantings during the period of rural political violence, the very low rate of adoption of advanced techniques of production, and the aging of the coffee plants. As a result, experts of ECLA/FAO characterized in 1958 Colombian coffee production as inefficient and suggested a complete transformation into a more productive structure.

From the 1970s onwards, and specially after the 1976 coffee "bonanza" in the international markets, Colombia a process of modernization based on the intensive use of modern inputs (fertilizers and agrochemicals), the introduction of new varieties and the intensification of cultivation practices began.

2. The Importance of Coffee in the Economy

Coffee has represented since the 1920s a significative part of Colombian total export revenues. In the period 1970-1975 this participation, however, tended to decrease, due to the greater dynamism of other export products in response to a set of economic policies geared toward the promotion of non traditional exports In

1976, as a consequence of the rapid increase of international coffee prices, these trends reverted, and, at the same time, the government was obliged to reorient its export incentive scheme. These two facts explain the increase in the participation of coffee in total revenues shown in Table 1-3. The share was maintained until 1987, when a new process of export diversification started. This time in response to the 1985 real devaluation and the initiation of oil exports. As a result, for the first time in the external sector's twentieth century history of Colombia, coffee represented only 36.4 of total export revenues.

The great importance of coffee in the Colombian external sector has determined a high dependency of the country on the behaviour of prices in the international markets. The economic cycle is very much interrelated with the behaviour of these prices as many studies have shown 7/, even more than in Guatemala and Costa Rica. The relative weight of coffee in the generation of external exchange is considered crucial for the operation of the rest of the economy. It explains widely the type of policies implemented with respect to the coffee sector, e.g. the price stabilization system, and the institutional framework created to support these policies. It also justifies the inmense power that the coffee sector has in the economy and in politics in the country. And at the same time, explains the different attitudes that the country has adopted at international negotiations. Most of

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7/ See, for example, Ocampo (1989).

TABLE 1-3 COLOMBIA: THE IMPORTANCE OF COFFEE IN THE ECONOMY, 1970-89

Years	% Tax revenues	Coffee sector surplus as % GNP	% Exports	% GNP
1970		0.5	60.1	3.5
1971		-0.1	53.5	2.6
1972		-0.2	44.0	2.8
1973		0.3	47.2	2.8
1974		0.7	38.5	2.4
1975		-0.1	37.3	3.2
1976		0.3	50.2	4.5
1977		-0.6	57.0	4.0
1978		1.4	56.0	3.5
1979		1.1	56.0	3.0
1980	5.9	1.3	55.0	2.8
1981	3.2	-1.8	56.2	2.5
1982	2.3	-1.1	51.1	2.8
1983	1.2	-1.5	50.0	2.3
1984	0.8	-0.1	52.2	2.4
1985	2.5	0.4	50.2	2.4
1986	4.1	3.0	59.7	3.2
1987	2.1	-0.4	36.4	2.9
1988	2.1	n.a.	44.2	
1989		n.a.	36.8	

Source: IMF, International Financial Statistics, several issues. DANE, National Accounts.
Several issues.
Ministerio de Hacienda
Ocampo (1989)
Calculations by the author

these topics will be fully analyzed in the next chapters of this study.

In terms of GNP, coffee has represented 3.0 percent on average, during the period 1970-89. During the 1970's as a result of the coffee "bonanza", the size of the sector relative to the rest of the economy tented to increase, but during the 1980's this has reverted due to lower real internal prices. Today, the coffee sector represents a 2.4 percent of GNP.

Another variable that measures the importance of the coffee sector in the Colombian economy is the contribution of the deficit or surplus of the Coffee National Fund in the government's deficit. This proportion is interesting only in the case of Colombia given the sui generis institutional framework prevalent.

CHAPTER II. INTERNAL COFFEE MARKETING AND INSTITUTIONS

In this Chapter the main aspects of the coffee marketing chains in each of the countries considered are described briefly. A panoramic vision of the coffee sector institutions and the main policy instruments is also given. All policies that have to do with production such as research, internal pricing, credit, and subsidies for inputs, however, are described and analyzed in the next chapter about production systems.

A. GUATEMALA

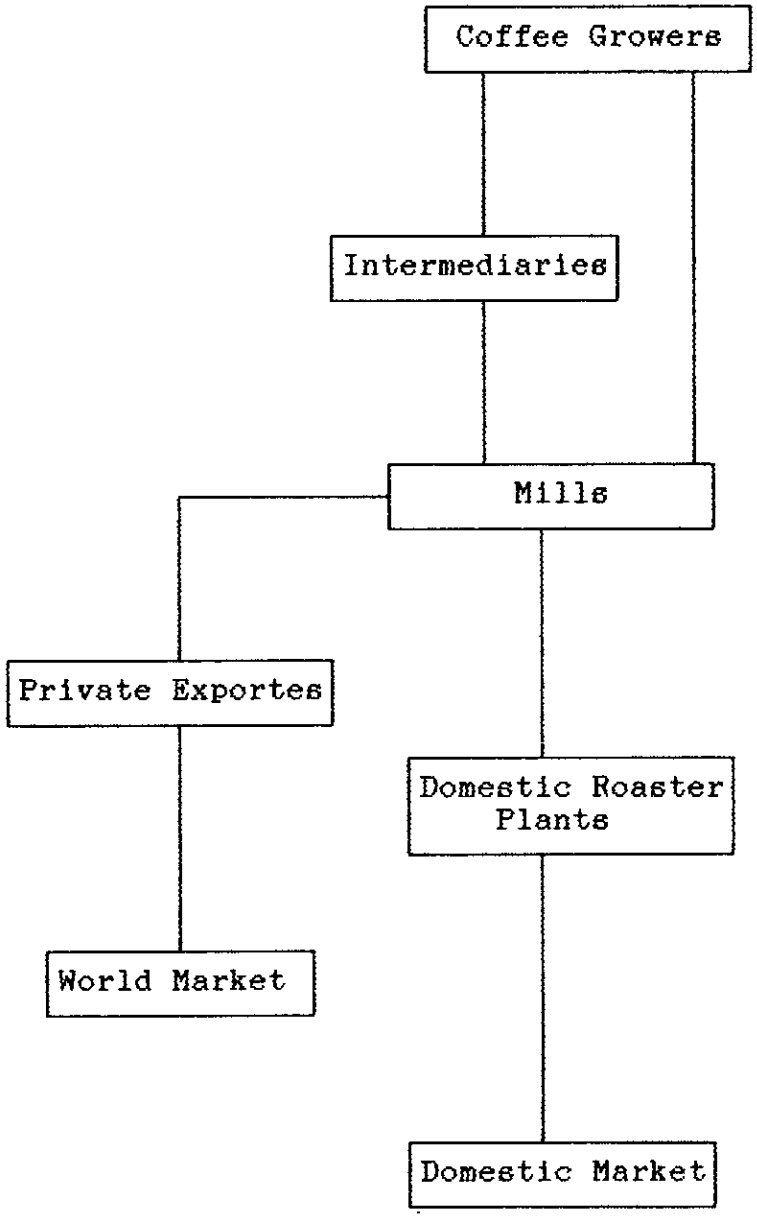
1. Internal Marketing

Coffee is harvested in Guatemala between September and December. The harvested coffee cherries are collected and transported to mills where they are washed and dried after a beneficiation process in which the coffee cherry is transformed first into parchment coffee and later into the green bean suitable for export. Approximately 90 percent of domestic production is destined for export markets (see Chart 2-1).

Whenever International Coffee Agreement (ICA) quotas are not in effect, the Guatemalan coffee producer is free to sell the total volume of the coffee harvested. He can either sell to export companies or if he has enough volume, he can himself become an

Chart 2-1

Guatemala: Internal Marketing Chain



Source: Elaborated by the author based on Mc Sweeney (1988) and Masters (1985).

exporter to the international market. When quotas are in effect, in turn, he has a limit to the volume he is allowed to sell and has to retain the difference between this amount and his total production. These surpluses are usually kept stored at the "Almacenes de Depósito", which are privately owned.

The major part of the Guatemalan coffee is sold in the international markets as green coffee. Exporters usually buy parchment coffee from intermediaries and process it in their own milling factories. Small producers and producers from marginal regions sometimes sell coffee in cherries, and their buyers (basically exporters) transform it in their own mills.

Most sales of small farmers are to intermediaries, who sell directly to exporters or to other intermediaries. These agents play a very important role in the domestic marketing and transport of coffee, and sometimes they even finance the producer's operation through cash advances. Unfortunately, is financing othen implies high interest rates and lower producer prices. Under these conditions, the small producer, who is already penalized by his low productivity, is also punished in the marketing of his product.

According to a study done in 1982 small farmers have access to 18.8 to 24.1 percent of the markup over costs in coffee marketing, while cooperatives and big producers get from 73.9 to 79 percent of these margins because they market coffee directly.

In 1988 there were 108 buyers-exporters of coffee in the country according to ANACAFE registers. They were in charge of approximately 85 percent of coffee exports. However, a small number of these agents (18, more or less) represent 80 percent of these exports. Most of these exporters were members of the Coffee Exporters' Association (ADEC). Periodically they hold meetings promoted by ANACAFE in which they resolve problems related to their activities.

On another side of the marketing chain, there are more than 500 producet that have volumes big enough to become exporters themselves. Most of them belong to the Coffee Producers Association (PROCAFE). These agents normally establish their own contacts with international companies to sell their coffee. On their own, they are in charge of getting export licenses, pay taxes and take care of ofwer administrative aspects related to coffee exports.

2. Institutional Organization

Because all production and marketing of coffee is in the hands of private agents, with the exception of a few state-owned plantations, the role of the government is limited to control and regulation, appart from the collection of taxes.

The Law of Coffee of 30th of April of 1969 created the National Council of Coffee Policy, maximum authority -after the

president- in all aspects related to coffee policy. According to its charter, the Council is in charge of the direction, orientation, development and execution of all coffee policies. The members of this council are: the Ministers of Agriculture, Finance, Public Affairs, International Affairs, the President of the Monetary Board and the President of ANACAFE. The latter is also the Secretary of this Council.

ANACAFE is the National Coffee Association. Its predecessors were the Coffee Central Bureau founded in 1928, and called afterwards (1960) the National Coffee Bureau. In the latter year ANACAFE was founded. During the 1960s its charter was modified several times, until in 1969 the Law of Coffee was promulgated. According to this law, ANACAFE is a private organization that represents the interests of coffee producers. Among its multiple functions ANACAFE can:

- operate technical research, experimental, demonstration, assistance and diffusion services in the diverse branches of the coffee industry.

- promote all economic and agricultural activities directly or indirectly related to the coffee sector, and the diversification of crops.

- organize all tasting, arbitrage, register, statistical, storage and other auxiliary services for the adequate production and marketing of coffee.

- direct all efforts to resolve the small farmers' problems specially in financing, technical advice in planting, processing and marketing of coffee at reasonable and fair prices.

- give export licenses.

Its Executive Board is conformed by 2 members: a representative of non registered producers (small producers), a representative of the government, eight representatives elected by the General Board, that is conformed by all registered producers.

In order to better meet these objectives, ANACAFE actively sought to register growers and monitor their production. A technical assistance program was also established to encourage better cultivation practices. Administratively, ANACAFE divided the coffee growing areas of the country into regions.

Appart from ANACAFE, there are other producer organizations in Guatemala. There are cooperatives and other associations like the Eastern Guatemala Coffee Growers Association (ACOGUA), United Coffee Growers Association (ACU), Experimental Coffee Association

(AEC), Republic Organized Coffee Growers Regional Association (CARCOR), and the Producer-Exporters Coffee Association (PROCAFE). Although most of the members of these organizations are big producers, there are some small producers aswell. These institutions play an important role in the development of the coffee sector in Guatemala. They have political, technical and social responsibilities in the sector and are very active in technology diffusion.

Almost a third of small producers are affiliated to cooperatives. In 1988 there were almost 123 of these cooperatives registered at ANACAFE. The oldest ones were created in 1969 and over time they have increased in number and in number of affiliates. It is estimated that 9,500 small producers belong to one of these cooperatives, which represent 24 percent of all small producers in the country.

There are three main cooperatives: FEDECOGUA, UCONOFEC and FEDECOVERA. The first one is the oldest, was founded in 1969 and has 67 associated smaller cooperatives. UNCONOFEC has been in operation since 1983 and has 36 more cooperatives. FEDECOVERA, organized in 1979, consists of 32 cooperatives of the northern region of Guatemala, and not only associates coffee producers, but also producers of cardamomo, cocoa, pepper and other minor agricultural products.

3. Coffee Policy Instruments

One of the main characteristics of the Guatemalan coffee sector is the existence of very few instruments of regulation and control like regulations on marketing and taxes levied on the different stages of coffee processing and exports.

a. Export controls

Coffee exporters are obliged by law to register all international sales to ANACAFE and the Bank of Guatemala. The objetive of this control is to regulate the excange inflows into the country, to keep record of the contracts with external buyers and to control tax payments.

When a producer sells his coffee in the domestic or external markets, ANACAFE has to be informed of the transaction within the next 24 hours, and the Bank of Guatemala within the following two working days. The contract with the external buyer has to be registered at the Central Bank in the next ten working days and to ANACAFE within the following 30 days. The original contract has to be sent to ANACAFE within the following 10 days of its celebration. ANACAFE is also the only authorized institution to give export licenses.

b. Ad-valorem export tax

Since June 6th, 1986 a new ad valorem export tax replaced the existing tax in effect since 1962 (Table 2-1). At that time international prices of coffee where high because of the Brazilian drought, and the government modified the tax to improve revenues.

The base of the new tax was the market price per quintal (46 kg.) of "prime washed" green coffee, ex-dock, N.Y.. From this price transport costs, insurance and othe commercialization costs were deduced to determining the FOB price in Guatemalan harbours, converted into quetzales. To this price the following table was applied:

Table 2-1

Up to	Q 237.5		0%
from Q237.5 to	Q 300.0		40% over the excess of Q 237.5
from Q300.0 to	Q350.0	Q25.0 +	55% over the excess of Q 300.0
from Q350.0 to	Q500.0	Q52.5 +	60% over the excess of Q 350.0
from Q500.0 to	Q550.0	Q142.5 +	75% over the excess of Q 500.0
from Q550.0 on		Q180.0 +	40% over the excess of Q 550.0

Source: Mc Sweeney (1988), pp 24.

This law was in effect until April 1990, but since the 6th of June of 1987 the tax started being dismounted at a monthly 3 percent. Today it has disappeared completely.

c. Other export taxes

ANACAFE resources come from a 1 percent tax levied on exports plus a fixed amount charged per volume (Q0.25). The law that provided funding for the institution came into effect in 1985. Before that ANACAFE was financed with the contributions of its affiliates.

B. *COSTA RICA

1. Internal Marketing [8/]

The flow of coffee from the farm to the shipping port is straightforward in Costa Rica (see Chart 2-2). Coffee farmers are required by law to deliver the harvested cherries to one of the more orless 100 private mills or any of their official collection points within 24 hours of actual harvest. Mills are in charge of the processing needed to convert the cherries into exportable green coffee, a process that involves depulping, washing, fermenting, drying, hulling, grading and bagging. Once the processing is complete, mills can either sell to one of the 25 registered

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8/ This section is based on Jaramillo (1989).

exporting firms or sell directly abroad. About half of the registered exporting firms also own milling factories.

The number of processing mills in Costa Rica has been falling steadily since the 1970s. Total milling capacity has kept pace with increasing production levels suggesting that the size of individual mills has expanded with time. During the record harvests of 1986/87 and 1988/89, there was some evidence of shortages in processing capacity in a few highly productive zones.

Sales for domestic coffee consumption take place at the biweekly auctions organized by the Instituto Costarricense del Café (ICAFE). Mills are required by law to sell through these auctions a percentage of their output determined anually by ICAFE. In the 1980s this percentage ranged from 10 to 14 percent. Private traders and domestic roasters buy green coffee at the auctions at prices that have been lower on average than border prices. In order to ensure that all coffee sold at these auctions is used for domestic consumption, ICAFE requires that all coffee be deposited at warehouses where coffee is treated with a blue dye in order to prevent it from being exported at a later stage. The low price prevailing at these auctions has led mills to sell only the lowest grades for domestic consumption. Once roasted by one of the 46 domestic roasting firms, coffee is sold to Costa Rican consumers through wholesalers and retailers.

2. Institutional Organization

Created in 1948, ICAFE (formerly OFICAFE) is also a private agency (parastatal) in charge of regulating all flows in the coffee sector. According to its charter, ICAFE regulates all aspects relating to delivery, processing, marketing and export of coffee in order to promote "equitable relations" between producers, mills and exporters.

ICAFE's most important role is in coffee pricing policy and tax collection. Producer prices are set by ICAFE's "Junta de Liquidaciones" 9/ while consumer coffee prices and flows are regulated through the domestic auction system. Further, ICAFE collects three coffee taxes that provide funding for its operating expenses: a domestic consumption tax, a 1 percent export tax, and a processing tax.

ICAFE also performs a multitude of additional roles such as:

-manages extension programs with Ministry of Agriculture;

-manages the Centro de Investigaciones del Café (CICAFE), the national research station;

-represents Costa Rica in international coffee fora;

9/ See Chapter III.

-regulates coffee standards and grades;

-allocates coffee export permits (i.e. ICA quota stamps) when applicable;

-aids in the development of the coffee cooperative system.

Since 1971, ICAFE follows the policy guidelines established by the Congreso Nacional de Cafetaleros, the governing body in change of formulating broad coffee policy and supervising ICAFE's performance.

Although ICAFE is legally empowered to buy and sell coffee, it has done so only on limited occassions involving small amounts.

3. Coffee Policy Instruments

a. Coffee Taxes

i. Ad valorem production and export taxes

Traditionally coffee has been the most heavily taxed of all commodities in Costa Rica. Taxes are levied at each step in the marketing chain, with specific taxes designed for production, processing and exporting. The major taxes are the ad valorem production tax and the ad valorem export tax. The first, collected

at the mills, has traditionally amounted 10 percent of the FOR (free-on-rail) price. The second tax is paid by the exporters directly to the central bank and currently ranges between 1 and 18 percent of the FOB price depending on the level of selling price appearing in the export contract (see Table 2-2). Proceeds from both of these taxes flow to the central government budget, where they have accounted for 7 to 12 percent of all government revenues (see Table 1-3).

ii. Other Taxes

A multitude of minor taxes are also levied at different stages in the marketing chain. Of the minor taxes, the most important ones are (1) the ICO's certificate of origin levy, (2) the export tax, and (3) the tax on domestic consumption. The ICO levy amount to US$0.26 per bag and the funds collected make up Costa Rica's contribution to ICO funding. The export tax is a 1 percent tax of the FOB price that the exporters must contribute to fund the operating budget of ICAFE. Finally, the tax on domestic consumption currently amounts to C 2.00 per kilogram bag payable by the roaster at ICAFE auctions. This tax also contributes to the funding of ICAFE's activities.

Although the total effect of this array of major and minor taxes varies from year to year, in the 1980s the have absorbed over 20 percent of the value of production. About 90 percent of the

revenues collected are credited to the government's budget and the rest is destined to cover ICAFE's operating expenses.

b. Marketing Regulations

Innumerable marketing regulations, supervised by ICAFE, control all flows of coffee in Costa Rica. In this section three of the most important regulations will be discussed: (1) the regulation of processing margins, (2) the allocation of internal coffee quotas by ICAFE and (3) the prohibition of private trading between producers and mills

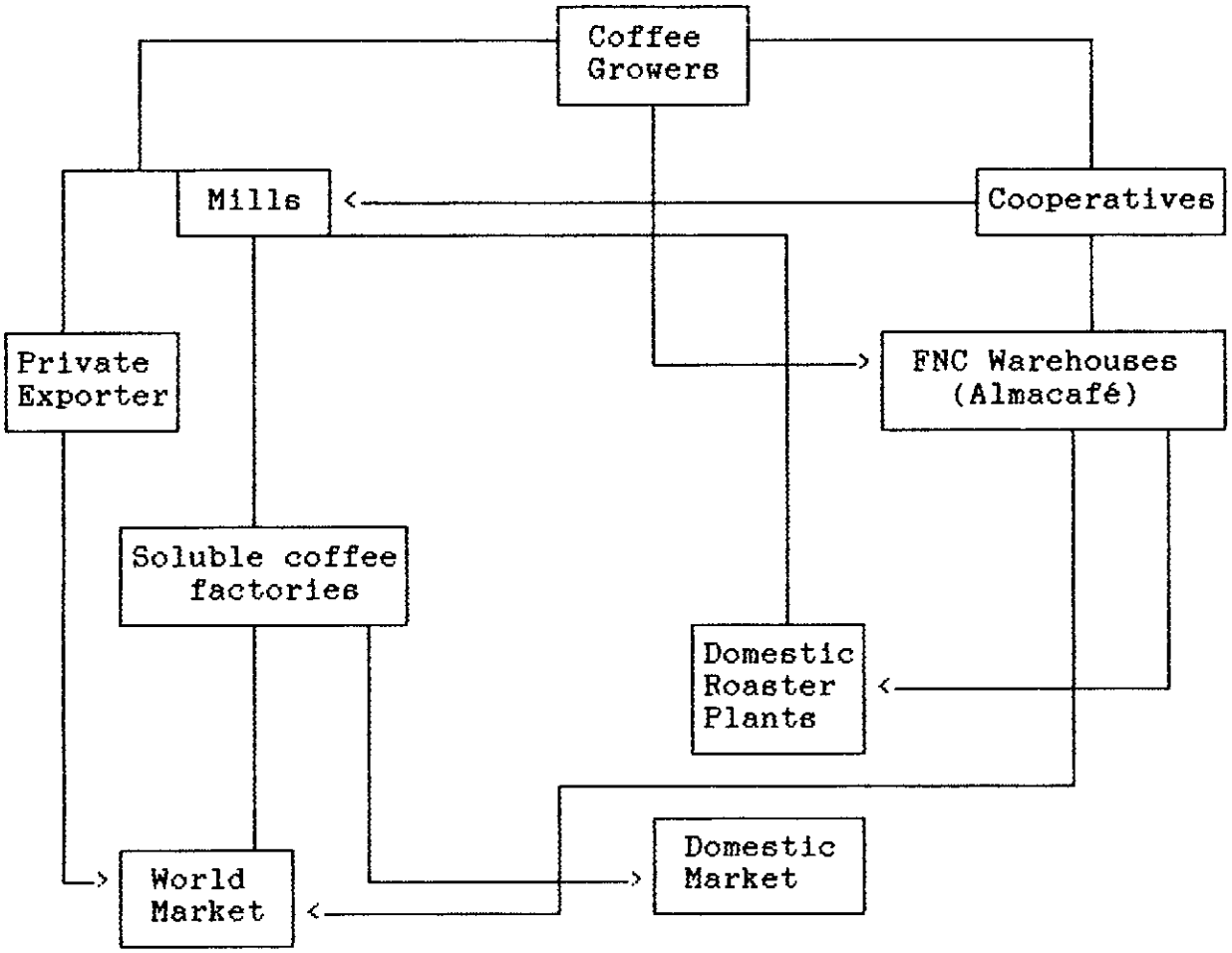
The first regulation involves the setting of fixed marketing margins by law for processors. Mills are allowed a 9 percent profit margin on the value of their output, after deducting production and processing taxes and "special processing costs".

The second set of regulations involves ICAFE's powerful role as central allocatoz of export, domestic and stock quotas. While ICA was in full operation, ICAFE assumed the role of distributor of the ICA quarterly export stamps. Mills were alloted a share of the national quota based on their output over the preceding two years.

A final marketing regulation of importance is the banning of all private coffee trading between intermediaries and millers. The legislation stems from the longheld belief of Costa Rican policy-

Chart 2-3

Colombia: Internal Marketing Chain



Source: Leibovich (1989), p.p. 19

makers that private traders are out to exploit poor coffee growers. This law is probably responsible for the increased monopoly power of mills and has also allowed them to appropriate a substantial share of the cherry transportation business by setting up collection centers throughout the production areas.

C. COLOMBIA

1. Internal Marketing

Coffee beans in Colombia are sold internally as green coffee, which implies more processing and value added by the producer to the harvested cherries than in the previous two cases described. Both the National Federation of Coffee Growers (FNC) and private agents are allowed to buy coffee from the producer. The price of these purchases is determined by the coffee authorities and is equal to the price set by the government. Market prices are equal to official prices, their differences explained mainly by differences in quality.

Coffee purchased from producers by private agents in destined to export markets. This coffee, however, pays a tax called the "retention" tax administered by the FNC (see Chart 3-3). Coffee that is going to be exported is processed further by these private exporters (selected, packed and transported).

The fraction of the harvest that the private agents do not buy, is bought by the FNC. A part of these purchases is stored, and another fraction is marketed. These proportions are determined by the FNC according to the obligations the country has in the ICA.

The marketing by FNC is done in two differentiated markets. Internal consumption, over which the institution has a monopoly power, and the external market. The FNC exports almost half of all coffee exported. The private sector covers the U.S. market while the FNC dominates exports to Europe.

2. Institutional Organization

Colombia has counted with a very complex coffee stabilization system similar to Brazil's. It is of a hybrid nature, involving private and publicly owned institutions. The National Federation of Coffee Growers (FNC) is a private organization but it administers the Nacional Coffee Fund, wich is of public character. The proceeds from one of the taxes levied on coffee exports are destined to finance the operation of the National Coffee Fund. This fund is in charge of purchasing each coffee harvest at prices negotiated between the government and the producers, represented by the FNC. It is also in charge of financing stocks and the internal and external commercialization that is not in the hands of private agents.

3. Coffee Policy Instruments

a. Minimum Surrender Price (precio mínimo de reintegro)

The minimum surrender price was established to regulate the exchange inflow from coffee exports marketed by private exporters. The FNC's coffee exports have a special treatment under the exchange regulations in Colombia.

b. Retention Tax

To regulate the profits of the private exporters, in 1958 the "retention" tax was created. Each exporter has the obligation to hand in a quantity of coffee proportional to the amount to be exported. Its proceeds are used for the financing of the FNC, coffee stocks and the surpluses are kept as savings for periods of low international prices.

c. Ad valorem export tax

There is an ad valorem tax applied to the value of exports. Its proceeds are destined to the central government budget, and usualy the government redistributes it to the coffee regions. It was created in 1967 and it replaced a differential exchange rate that applied to coffee exports. In the last ten years, there has

been a clear tendency to lower this tax. It is around 61/2% of the value of exports, and it 21/2 points are redistributed to coffee regions. The result of this has been a greater portion of resources in the hands of the sector, with a limited distribution to the rest of the economy.

d. Internal Consumption Price

CHAPTER III. PRODUCTION SYSTEMS

The evolution of production in the three countries has been different during the past twenty years and the causes of this behaviour have been equally different. As it was shown in the previous Chapter, there are substantial differences with regards to the institutional framework, and overall, the degree of state or private interventionism in the coffee sector. This aspect plus the heterogenerity within the sector can be considered the main determinants of their evolution during this period of time.

A. GUATEMALA

1. Production Modes and Employment in the Coffee Sector

The Guatemalan coffee sector can be characterized as an extremely polarized structure: on one side there is a great number of small producers with a very low share of national coffee production and, on the other, a very small number of medium and big producers that represent almost 60 percent of coffee production.

This very high degree of concentration can be visualized also from the following figures: nearly 72.5 percent of coffee farms use 7.3 percent of the land and explain 5.4 percent of total production. Medium farms -berween 2.2 and 10 hs.- use 8.8 percent of the land and participate in 5.8 percent of total coffee

TABLE 3-1 GUATEMALA: COFFEE PRODUCTIVE STRUCTURE - 1987

Size (hectares)	Average size of plantation (hectares)	% of total production units
0.1 - 2.0	0.7	72.5
2.2 -10.6	3.6	17.8
10.6-89.7	62.4	5.8
< 89.7	94.1	3.8
Average	7.3	100.0

Source: World Bank (1987)

production. These figures imply that 90.3 percent of total coffee farms are very small production units and that their share in total production is at most 12 percent. This also means that the great majority of Guatemalan coffee producers are in a critical situation they own and produce in extremely small plantations, with very low productivity. At the other extreme of the productive structure, the biggest 11 percent of the farms generate 89 percent of total production.

A field survey carried out by ANACAFE in 1982 [10/] detected different cultivation techniques and technologies used by Guatemalan coffee growers. The survey identified 24 modes distributed over different farm sizes and regions. The predominant characteristic of the Guatemalan coffee sector appeared to be the generally low level of technology used. Approximately two-thirds of the total number of coffee farms did not use chemical inputs (fertilizers, fungicides, herbicides) and did not properly regulate tree shade nor used improved tree varieties.

By far the predominant variety of coffee tree grown in Guatemala is BOURBON with 70.3 percent of the farms growing this variety. BOURBON is followed by TYPICA (22.8%), CATURRA (5.3%), PACHE (1.1%) and CATUA (0.5%). Only the latter three varieties are considered "improved" varieties with a greater yield and faster

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10/ See Masters (1985).

growth characteristics. Historically BOURBON has gradually replaced TIPYCA as the main variety of arabica coffee grown in Guatemala.

Another predominant feature is the relative low density of coffee planting. Roughly two-thirds of farms had 625 to 1111 coffee plantings per square "manzana" of land. This is considered excessive use of land associated with a lower level of technology in coffee cultivation. Only 4.1 percent of farms used dense planting systems generating higher yields per unit of land.

Overall, a majority of coffee growers (54.8 percent) practice pruning of coffee trees, usually in the early part of the year. However, among the small growers only 40 percent practised annual pruning of coffee trees. In general, the system used was suboptimal and not considered "best practice". Only 13.5 percent of those that prune their trees annually used a systematic approach which tends to even out variances in annual yields due to the so called biennial cycle in tree fruit production.

The shade factor is important in coffee cultivation. The amount of sunlight received by the plant influences its rate of growth through the photosynthesis process. More sunlight increases the plant's requirements for nutrients which ofter must be supplemented through application of fertilizers. The results of the survey indicated that only 17.5 percent of farms in Guatemala

practice shade control in a technically recommended way, 53.7 percent used excessive shade.

This 90 percent of small producers use family work in their plantations instead of hiring salary-workers. Medium producers also usually use this type of work, but sometimes need to hire workers during harvest periods. However, the latter have had the greatest productivity increases in Guatemala. Big production units, on the other hand, are extensive and usually less productive than the medium ones.

Seasonal labour is provided by migratory labour mainly from the Indian highlands of Guatemala. Employment requirements vary between 78 and 270 days per hectare, depending on the exploitation intensity of the coffee farm. About 90 percent of these farms are attended by their owners and the bigger farms are managed by hired administrators. Coffee production in Guatemala is one of the main sources of employment in the agricultural sector.

ANACAFE has estimated that approximately 123,000 men are employed permanently at coffee farms in Guatemala. Coffee harvest provides employment for about 175,000 additional seasonal workers, which means total employment of 167,640 men. The labour force employed in the coffee sector represents 8.1 percent of the total work force in the country and 16.2 percent of the agricultural labour force.

TABLE 3-2 GUATEMALA: EMPLOYMENT IN THE COFFEE SECTOR-1990

	Number of employees (000)	% Agri culturel Employment	% Total employ-ment
Coffee sector	167	16.2	8.1
Agriculture	1029	100.0	50.2
Other sectors	1023		49.8
Total	2052		100.0

Source: World Bank (1980)

It is very difficult to estimate the exact share of seasonal workers during harvest periods in total coffee employment, given that cultivation practices are not intensively used.

2. Coffee Supply

Unlike Costa Rica and Colombia, as it will be analyzed later, Guatemalan coffee production has remained stagnated during the past 30 years. Eventhough the area under cultivation expanded between 1960 and 1973 at an annual 2.5 percent, after that it remained almost unmodified.

The coffee bonanzas in the international market of the late 1970s and middle 1980s do not seem to have affected the development of the Guatemalan coffee sector. This lack of dynamism has resulted in a loss in the country's share in the international market, as is fully explained in the last chapper of this study.

3. Production Policies

Of the three cases analyzed, Guatemala has the least developed coffee institutions and policies. As it was described in the previous chapter, coffee production and marketing are entirely in the hands of private agents, and the role of the public sector is basically the control and regulation of taxes imposed on the coffee sector.

All research policies are promoted by privately owned organizations (cooperatives of big producers). They have played an important role in the supply of technology to their associates. Representatives of these organizations usually pay visits to the production units in other countries (usually Costa Rica) and invite foreign technicians to teach cultivation practices applied in other countries.

These programs of technological aid, in theory, the responsibility of ANACAFE, have been in the hands of descentralized private agents for the following basic reasons: ANACAFE lacks of adequate funding and because all aid provided by this agency is directed to small producers since 1981.

Since that same year, ANACAFE has directed all aid through a program called "Grupos de amistad y trabajo" (frienship are work groups). This program until November 1987 had organized 435 groups with more than 7,800 farmers, which represented 19.6 percent of all small producers in Guatemala, with an average area of 1.5 hectares per producer. The program consists of groups of 10 to 30 farmers and teaches them new technologies. These are informal groups, and participation is voluntary. The participants learn about new techniques in coffee production, and some basic aspects of other social activities. The main contribution of this program has been the increase in yields. In the 1986/87 harvest these groups have increased yields to 585 kgs of green coffee per hectare,

TABLE 3-3
AREA HARVESTED AND PRODUCTION

	GUATEMALA		COSTA RICA		COLOMBIA	
	Area (Hectares)	Production (000 BAGS)	Area (Hectares)	Production (000 BAGS)	Area (Hectares)	Production (000 BAGS)
1968/69	224	1812	73	1228	903	6900
1969/70	219	1947	74	1403	916	7200
1970/71	225	2078	76	1295	924	7800
1971/72	255	2385	77	1551	937	6910
1972/73	245	2269	78	1266	927	8240
1973/74	254	2427	80	1539	908	7360
1974/75	251	2624	83	1430	920	8600
1975/76	257	2318	82	1276	928	8760
1976/77	258	2643	82	1331	918	9840
1977/78	258	2804	81	1449	924	10490
1978/79	255	2827	81	1749	961	11570
1979/80	238	2747	81	1522	970	12550
1980/81	244	2957	83	2140	977	13040
1981/82	263	2321	83	1782	986	12900
1982/83	272	3156	85	2300	979	12800
1983/84	266	3050	87	2070	972	13460
1984/85	272	3277	90	2510	987	10710
1985/86	269	3027	91	1514	992	11890
1986/87	275	3280	92	2566	1008	10860
1987/88	280	3200	97	2375	1018	12670
1988/89	260	3000	100	2758	1100	10480
Rates of Growth						
1968/69-1971/72	4.4 %	9.6 %	1.8 %	8.1 %	1.2 %	0.0 %
1972/73-1980/81	0.4 %	-2.4 %	-0.5 %	-2.3 %	-0.6 %	-5.1 %
1981/82-1985/86	-0.6 %	-6.4 %	-2.3 %	4.2 %	-0.1 %	2.1 %
1986/87-1987/88	1.9 %	3.0 %	-2.7 %	-2.4 %	-2.9 %	1.2 %
1968/69-1987/88						

Source: USDA, Calculations by the author.

significantly above the national average of 556.3 kgs/hre. This has been done without any financial aid.

In Guatemala there is no producer price policy. There are only seven qualities defined and among them the prime coffee is the standard quality and there are premiums and punishments according to the difference of each type of coffee from this standard quality. This system has not favoured small producers, because they usually have to sell to intermediaries that at the same time finance their operation with money advances at very high interest rates.

Agricultural credit, on the other hand, although there are clear dispositions that determine the instruments to promote financing of the coffee sector in the short and long run, is not widely used. Most capital invested in coffee production in Guatemala is the producer's own. This is of course a severe obstacle for the expansion of the coffee sector. During 1985 and 1986 crop years, for example, institutional financing only covered 1.9 percent and 1.8 percent of the value of the harvest respectively. These figures have a clear implication: about 98 percent of farmers finance their production with their own resources or through cash advances given by export companies. More recently there has been some financing from the National Agricultural Bank. However, the requisites on collaterals are a clear limitation to small producers.

TABLE 3-4. PRODUCER PRICES, 1975/76-1988/89
(US$ cents/pound)

Years	Guatemala	Costa Rica	Colombia
1975/76	54.92	66.85	44.89
1976/77	100.78	139.80	87.72
1977/78	100.09	139.80	89.55
1978/79	84.11	110.09	83.94
1979/80	75.73	86.85	81.57
1980/81	82.44	109.65	81.58
1981/82	68.04	69.50	74.48
1982/83	83.82	60.37	75.97
1983/84	78.99	54.29	74.80
1984/85	115.77	64.64	69.80
1985/86	116.16	65.10	60.46
1986/87	299.18	103.79	74.77
1987/88	124.37	86.18	79.23
1988/89	86.35	75.32	88.45

Source: ICO price bulletin. Several issues

There are no specific instruments to facilitate the distribution of modern inputs or seeds to Guatemalan coffee producers. All these facts explain the technological lag exhibited by the Guatemalan coffee sector in comparison with other coffee producer countries.

4. Yields and Production Costs

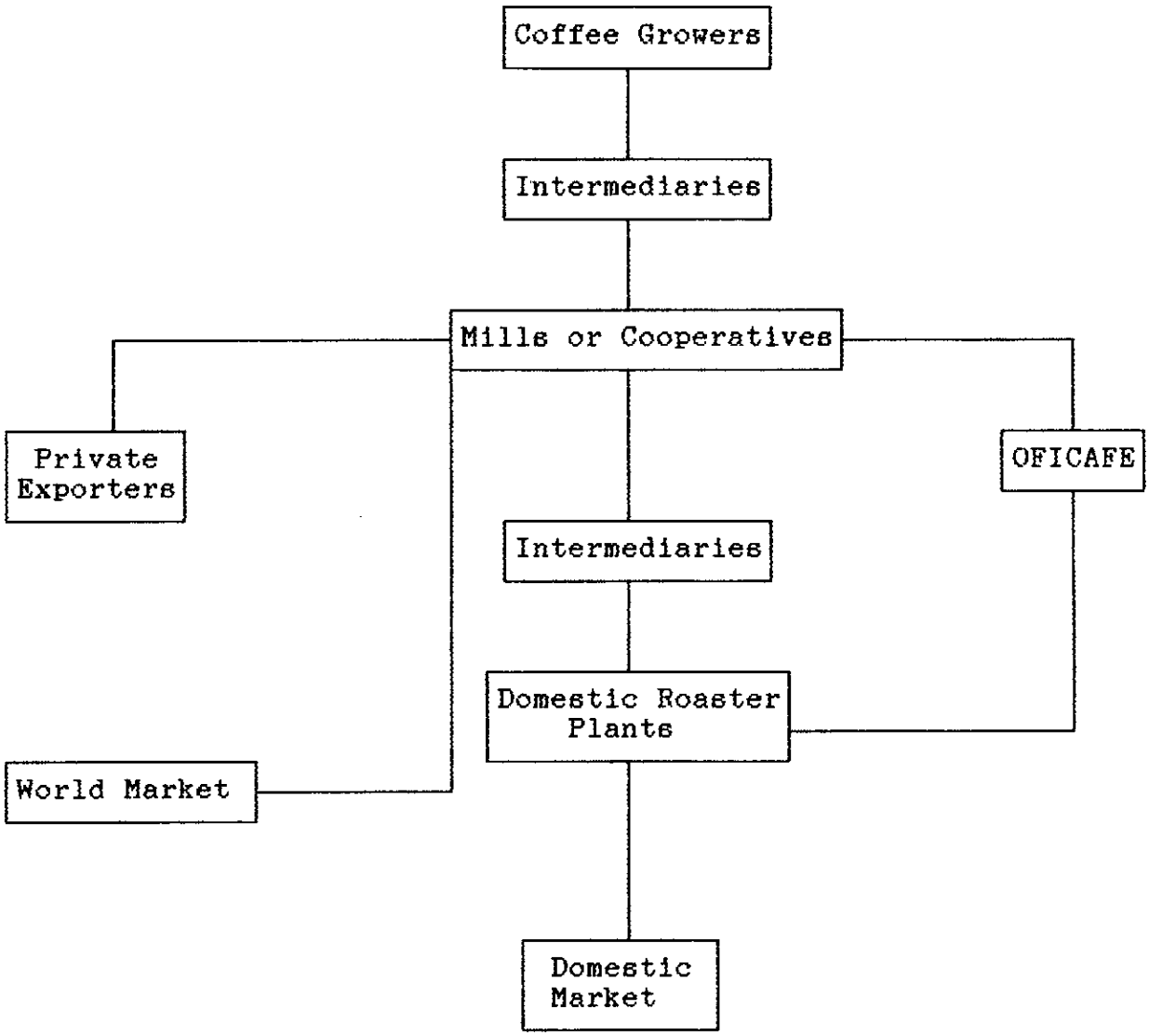
This technological lag has had also important implications with respect to Guatemalan coffee production yields. These are very low if they are compared to other International Coffee Organization (ICO) producer members.

Guatemalan yields have remained almost constant at levels of 650 kg per hectare since the 1970s. Only during the 1960s there was some improvement in this variable, according to ANACAFE registers. However, other sources of data question this improvement shown by ANACAFE's figures.

Given the great concentration of the productive structure in Guatemala, there is also a great dispersion of the annual yields among the different producer's strata: small producers and cooperatives have average yields that range between 199 and 281 kgs. of green coffee per hectare, substantially below the national average that ranges between 348 and 356 kgs/h. Medium and big producers, on the other hand, have average yields substantially

Chart 2-2

Costa Rica: Internal Marketing Chain



Source: Leibovich (1989), p.p. 31.

TABLE 3-5. GUATEMALA, COSTA RICA AND COLOMBIA: LABOUR PRODUCTIVITY IN THE COFFEE SECTOR

Country	Years	Productivity (60k bags/men)
Guatemala	1980 1/	17.6
Costa Rica	1988 2/	43.1
Colombia	1984/85 3/	28.1 a/
		21.1 b/

Sources: Calculations based on:
1/ Masters (1985)
2/ Jaramillo (1989)
3/ Errázuriz (1988)
a/ Estimation 1
b/ Estimation 2.

TABLE 3-6. GUATEMALA, COSTA RICA AND COLOMBIA: AVERAGE ANNUAL YIELDS AND DENSITIES

Country	Years	Yields	Densities
Guatemala	1961/62-1965/66	653	n.a.
	1971/72-1975/76	653	n.a.
	1981/82-1985/86	530	600-1100
	1986/87	523	n.a.
Costa Rica	1961/62-1965/66	878	n.a.
	1971/72-1975/76	1059	3498
	1981/82-1985/86	1401	3922
	1986/87	1507	4170
Colombia	1961/62-1965/66	574	2500
	1971/72-1975/76	468	2447
	1981/82-1985/86	754	2645
	1986/87	650	2650

Sources: USDA, World Bank (1980), Masters (1985)

TABLE 3-7. GUATEMALA, COSTA RICA AND COLOMBIA:
COMPOSITION OF COFFEE PRODUCTION COSTS- 1987

Cost Item	Guatemala (%)	Costa Rica (%)	Colombia (%)	Arabica producers (%)
Establishment	12.1	13.9	15.1	9.9
Maintenance	45.0	32.2	42.4	47.6
Harvesting	34.2	43.5	38.4	31.9
Processing	8.5	11.1	6.5	10.5

Source: Landell Mills (1990)

TABLE 3-8. GUATEMALA, COSTA RICA AND COLOMBIA:
PRODUCTION COSTS COMPARISON, 1987.
(All Arabica producers=100)

Item	Guatemala	Costa Rica	Colombia	Arabica producers
Establishment	140.8	136.9	176.2	100.0
Maintenance	109.7	69.2	103.7	100.0
Harvesting	123.9	139.5	131.3	100.0
Processing	115.5	102.4	116.4	100.0
Total Costs	115.5	102.4	116.4	100.0

Source: Landell Mills, op. cit.

higher that are above 20 to 64 percent the national average. These results show how great the productivity problems are in the Guatemalan coffee sector.

A recent study 11/ on worldwide production costs ranked Guatemala in position 17 within 20 arabica producers. This means that production costs in Guatemala are high with respect to the majority of arabica producers. The principal cost items that explain the differences are the establishment of coffee plantations and the harvesting of coffee.

B. COSTA RICA

1. Production Modes and Employment in the Coffee Sector

The evolution of the productive structure of the Costa Rican coffee sector can be analyzed with the figures provided by the 1973 and the 1984 census. According to these data, there was an increase in the number of exploitations of about 6.5 percent between these two years. The number of farms increased from 32,350 in 1973 to 34,464 in 1984. However, the average size of these farms remained stable at a level of 2.6 hs. The number of farms smaller than 3 hs was substantial in both years and tended to increase: almost 47.4 percent of all coffee farms were in 1973 in this range and in 1984

11/ Landell Mills Commodity Studies "A World Survey of Coffee Production Costs", Oxford, December 1989.

TABLE 3-9. COSTA RICA: COFFEE PRODUCTIVE STRUCTURE (1984)

Size	Average size of coffee plantation	% of exploitations
>1	0.38	25.4
1.1- 3.0	1.20	28.1
3.1- 10.0	2.40	25.8
10.1- 20.0	3.70	9.2
20.1- 50.0	5.30	7.3
50.1-100.0	11.00	2.6
<100	35.20	1.6
Average	2.60	100.0

Source: National Statistical and Census Direction

TABLE 3-10. COLOMBIA: COFFEE PRODUCTIVE STRUCTURE (1970)

Size	Average size of coffee plantation	% of exploitations
>1	0.44	12.6
1.1- 3.0	1.10	25.3
3.1- 10.0	2.40	31.5
10.1- 20.0	4.60	13.9
20.1- 50.0	7.60	10.8
50.1-100.0	12.40	3.6
<100	23.90	2.2
Average	3.50	10.0

Source: National Federation of Coffee Growers, 1970

this proportion increased to 53.5 percent. At the same time, there was a increase in the participation of these farms in total production and in total area cultivated with coffee.

Farms between 3 and 10 hs. also showed great dynamism, reflected in similar increments in their participation in production and area planted. On the other hand, farms bigger than 10 hs lost participation in total coffee production between 1973 and 1984. However, these decreases in the number of production units, participation in production and area planted, were accompanied by an increase in the average size of the farms.

During the last three decades, coffee production has been undergoing a technological revolution in Costa Rica. Since the early 1960s, highly productive coffee varieties have been replacing the traditional TYPICA strains. The new varieties -i.e. HYBRIDO TICO, CATURRA, CATUAI, and MUNDO NUOVO- are the result of Costa Rican efforts at adapting highly productive Brazilian, Salvadorean and Colombian strains. The new varieties have also encouraged the adoption of new cultivation practices including intensive herbicide and fertilizer applications as well as increased plantation densities which are partially accountable for the rapidly increasing yields.

The increasing costs of land and labour have imposed the adoption of the new coffee varieties. Currently, it is estimated

that all suitable land for coffee production is in use. The record harvest of 1988/89 benefited from the availability of Nicaraguan immigrant labour which helped to ease the domestic labour shortage increasingly evident in pervious harvests. With the new varieties, both productivity and labour in coffee have increased significantly. By 1988, ICAFE estimated that over 90 percent of the area planted with coffee was planted with the new high yielding varieties, explaining Costa Rica´s record yield.

The traditional technology, predominant until the 1950s, was characterized by low tree densities averaging approximately 1500 trees per hectare. Shade trees were use to reduce the weed growth and prevent the full exposure to the sun of coffee trees. Fertilizer and other modern inputs were seldom used due to the low response of the TYPICA variety. In contrast, the new high yielding varieties are planted at high densities of up to 10,000 trees per hectare. Shade trees are optional and often unnecessary. The new varieties are also highly responsive to fertilizer applications as well as modern pruning techniques. In recent years, stumping of the coffee trees after six to eight harvests has become a popular investment alternative, allowing a faster and less costly renewal cycle of the plantation than the traditional method of uprooting and replanting.

Coffee rust was detected in Costa Rica in the early eighties. Farmer awareness campaigns have been succesful in spreading the use

of copper-oxichlorane based perticides to treat the disease. A new rust resistant variety, CATIMOR, is currently being tested by the coffee research station, CICAFE, and is expected to be released for planting in the early 1990s.

2. Coffee Supply

Over the past decades, the Costa Rican coffee sector has developed a reputation as the most dynamic and high yielding in the world. Production has expanded at a healthy annual rate of 3.5 percent during the period 1960-88. Musch of this growth can be attributed to the rapid difussion of new high yielding coffee varieties since the early 1960s. While production increased by 190 percent between 1960 and 1988, the area under cultivation only expanded by 56%. Yields on the other hand, went from 14.9 to 27.6 bags per hectare in the same period -an increase of 98 percent- making Costa Rica a leader in coffee yields worldwide.

3. Production Policies [12/]

a. Research and Development

Unlike Guatemala, Costa Rica has a solid institutional framework in charge of directing, designing, promoting and executing all coffee production policies. However, there are some

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12/ This section is based on Jaramillo (1989).

fundamental differences that come from the fact that multiple institutions participate in the design and execution of these policies, and these labours are not concentrated or monopolized by a single agency, like in the case of Colombia.

All research and development and rural extension services, aspect in which Costa Rica is a recognized world leader, for example, are a shared responsibility of the Ministry of Agriculture and the National Research Centre (CICAFE) created in 1977 as a department within ICAFE. These two institutions are responsible for the success in the adaptation and generation of the new high yielding varieties of coffee, as well as for the improvements in cultivation practices since 1960. Compared to other coffee producing countries -specially Colombia-, Costa Rica's research efforts have been widely succesful. CICAFE has also devoted considerable resources to the research in coffee processing methods.

Extension of improved cultivation practices are offered by a wide array of agents in Costa Rica, which include the Ministry of Agriculture, ICAFE, the banking system, the Federation of Cooperatives (FEDECOOP). The competition between alternative extension services, both public and private, according to some authors [13/], has kept the services dynamic and effective. The succesful organization of extension services is also accountable

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13/ See Jaramillo (1989).

for the rapid spread of the new production technologies. During the 1950s, the support to these programs was given by the producers, in what became later a very close relationship between the government research services and the private sector. Other institutions devoted to technological research are the University and the ICAITI.

There are also important efforts done to train technicians by PROMECAFE, a special regional program to increase conditions for the development of the Central American coffee sectors.

Policies oriented to the protection and stimulus of the producer cooperatives, all grouped in FEDECOOP, have also played a very important role in the production dynamism of Costa Rican coffee sector. These cooperatives are exempted from paying income tax and have easy access to abundant subsidized credit given by special programs funded by the IDA. Affiliates to these cooperatives are beneficiaries of services like short-term credits, marketing of modern inputs, tools and agricultural machinery, coffee processing, and social secutiry for the producers' families. More recently, almost every producer cooperative owns a mill.

b. Producer price policy

Without any doubts, the most important role played by ICAFE has been the establishment of the producer price througn the Junta

de Liquidaciones. Payments to coffee producers in Costa Rica are closely regulated by ICAFE's enforcement legislation shaping the relationship between producers, millers and exporters. Millers are required to extend a minimum advance payment to producers upon delivery. According to Costa Rican law, the Junta de Liquidaciones must regulate minimum advance payments for all mills, which are expected to cover farmers' harvesting costs. In practice, competition between mills has usually lead to prices above the minimum required.

Mills are allowed to sell the processed coffee throughout the year to exporting firms or directly to foreign buyers. They must also meet ICAFE's domestic consumption delivery requirement. As these sales take place, mills are required to meet minimum quarterly payments to producers set by the "Junta de Liquidaciones". The rationale behind the setting of a quarterly minimum payment stems form the ICA's system of alloting quarterly export quotas to each country. In Costa Rica, these quotas have been traditionally distributed by ICAFE to mills according to their average performance over the two preceding years. The competition between mills to lure growers to deliver to their facilities often leads them to extend payments that exceed the minimum required amounts.

Shortly after the end of the crop year, millers are required to meet the cumulative "Minimum Liquidation Price" set annually for

each mill by the "Junta de Liquidaciones". By law, The "Minimum Liquidation Price" for each mill is derived by subtracting certain special processing costs [14/], taxes and a 9 percent profit margin from total sales revenue. If by the end of the crop year a mill has paid a cummulative amount above its mandated "Minimum Liquidation Price", the mill does not have the right to obtain a refund from farmers for the amount overpaid.

The Costa Rican pricing system is unique in that it explicitly bars farmers from obtaining full payment for their crop at delivery. Costa Rican law expressly forbids coffee sales at prices lower than minimum price at the end of the crop year when minimum price levels are announced. Compared to the usual payment at delivery method prevalent in most producing countries, the Costa Rican system can be seen as a method to force farmers to extend credit to mills while the latter finds a buyer for the product. With this system, all price risk is transmitted to the farmer whose final price depends on the marketing decisions of the mill [15/].

The time law associated with the present pricing system is likely to affect investment and input application decisions by

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14/ "Special processing costs" are defined by law to include transportation, fuel, electricity, wages and insurance costs.

15/ In costrast, mills are virtually absolved from facing any price risks. With a regulated 9 percent profit margin, coffee milling is one of the most profitable businesses in Costa Rica.

farmers. They face a great deal of uncertainty surrounding the expected marginal revenue from any additional production.

c. Credit and other subsidies for inputs

The credit policy for the coffee sector in Costa Rica is based in two main mechanisms: the provision of credit available for short-run operation and long-term investment, and the subsidies through interest rates for cooperative credit. Until 1984, the national banking system of Costa Rica was the major source of credit in the coffee sector. This situation was drastically altered in 1984 when reforms connected to the macroeconomic adjustment program effectively eliminated all domestic credit for the coffee sector. The situation forced mills and exporters to resort to foreign loans to finance the production activities of their clients.

Millers and producers have expressed their dissatisfaction with the foreign financing of production. This system is more expensive than using domestic credit since the latter traditionally involved subsidized real interest rates. The current system is forcing producers to pay the international opportunity cost of capital, increasing the efficiency of the sector.

The second credit mechanism has been the continued provision of funds at subsidized rates to farmer cooperatives. The sources of

these funds have been the national banking system as well as soft loans from foreign donors. Most of these funds have been used to alleviate the financial troubles of some of the coffee cooperatives.

In the 1980s, the use of chemical fertilizers and pesticides increased sharply in the Costa Rican coffee sector. Fertilizer use augmented in response to the rapid diffusion of the new coffee varieties that have proved to be highly responsive to fertilizer applications. Pesticides have become widely used with the penetration of rust disease into the country since the early 1980s. Copper based fungicides have proven most effective against rust.

Some 85 percent of fertilizer supply is provided by FERTICA, a state owned plant which produces mixes for the domestic maket from mostly imported ingredients. Some subsidies iron fertilizer prices have been in place at different times in the current decade. FERTICA has been given in some years access to preferential exchange rates for the imports of inputs. Fertilizer prices have also been kept low through controlled margins at wholesale and retail, as well as through exemption from sales taxes.

ICAFE has been actively involved in the production and supply of high yielding variety seedlings. The seedlings are produced by more than 200 seed nurseries that distribute some 9 million

seedlings annualy. The seedlings are sold at cost of production often underselling those available from private nurseries.

The seedling distribution policy has contributed to the diffsion of high yielding varieties in Costa Rica. While subsidized price has probably accelerated diffusion rates, by now the advantageous production characteristics if the new varieties are well known and the economic externalities that could be derived from the subsidy are negligible.

4. Yields and Production Costs

The evolution of yields in Costa Rica has been the most dynamic in the world. These yields increased from 894 kgs./h in 1960 to 1656 kg/h in 1988, which means a cumulative growth of 98 percent in this period. This very high level of yields per hectare has its origin in a higher tree productivity, due to high fertilization efficiency and greater densities of cultivation.

These high yields are reflected in the low production costs that Costa Rica has. According to the LMC study, Costa Rica is ranked 10 within 20 arabica producers. This counry exhibits very low costs of plantation and establishment of coffee plants, and of maintainance during their life cycle.

C. COLOMBIA

1. Production Modes and Employment in the Coffee Sector

In order to analyze the productive structure of the Colombian coffee sector the latest figures available are unfortunately from the 1970 census. This information, therefore, does not show the effects of the introduction of modern technologies in coffee production in Colombia, specially in certain regions.

In general terms, the main aspect is the clear differentiation between the productive structure of the coffee sector and the rest of agricultural activities. There are also very heterogeneous conditions in production as reflected in the different sizes of the farms, the varieties of coffee grown and the yields of these plantations.

In comparative terms, the coffee sector structure was in 1970 less concentrated than the average in the rest of the agricultural sector. While in the coffee sector 45.4 percent of the farms were between 3 and 20 hectares, only 21.3 percent in the rest of agricultural activities were of 5 to 20 hectares. Additionaly the proportion of medium-size farms (between 21 and 100 hectares) was greater in the coffee production zones than in the rest of the country.

This heterogeneus structure is reflected in the figures shown in Table 3-9. Nearly 37.9 percent of the coffee farms are classified as small (between 0.1 and 3 hs). These minifundia although numerous, had an average area of coffee production of 0.44 and 1.1 hs, represented 9.4 percent of all coffee plantings and generated 8.4 percent of all domestic production. About 31.5 percent of all production units betweem 3.1 and 10 hs. had 21.5 percent of all coffee planted and represented 20.7 percent of total production in 1970.

Medium-size coffee farms -from 10 to 50 hs.- are 24.7 percent of all coffee farms, have 41.3 percent of coffee planted and their participation in production is of 41.3 percent. Big farms (greater than 50 hs.) are just 5.8 percent of all coffee farms, with 27.6 percent of total plantations and a participation in national production of 29.1 percent.

Since 1970 there has been a very complex technological change in the Colombian coffee sector, based on the introduction of new genetic varieties, the intensification of cultivation practices and in a more intensive use of modern inputs.

The introduction and sistematization of better cultivation practices is reflected in better conditions for the installation of coffee plants; the creation of seed-weeding laboratories oriented to the development of rust resistant varieties; and the increase in

the density levels. Fertilizer consumption has also increased dramatically reaching a national average level of 300 k/h in the eighties from 150 k/h in the early 70s.

This process has been so important that in 1988 it was estimated that 524,784 hs. were planted with new varieties, representing nearly 53.4 percent of all areas planted in coffee. These plantations use on average fertilizers intensively at a rate of 435 k/hs.

The modernization of the coffee productive aparatus has also implied dramatic changes in the sector's employment. First, there has been a generalization of seasonal employment for almost labour, at the expense of permanent types of employment. Second, the expansion of salary-jobs in almost all types of farms at the expense of other types of non-remunerated jobs. Employment in the coffee sector has been estimated between 423,000 and 564,000 men[16]/. These figures represent between 5 anf 6.2 percent of total employment in the economy, and between 19 and 25.4 percent of employment in the agricultural sector.

The structure of the coffee sector employment is characterized by a great seasonality. However, in periods of generalized uprooting practices -as in the 1975 and the 1986 coffee bonanzas-

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16/ Hay otras estimaciones

TABLE 3-11. COLOMBIA: EMPLOYMENT IN THE COFFEE SECTOR-1987
PRODUCTIVE STRUCTURE (1984)

	Number of employees (thousands)	% of Agricultural Employment	% of Total Employment
Coffee sector	423-564	19.0-25.4	5.0-6.2
Agricultural	2300	100.0	26.3
Other sectors	6200		73.7
Total	8460		100.0

Source: Errazuriz (1987)

the investment employment modified employment practices, increasing the demand for labour in non-harvest periods.

In the period 1970-88 there was a gradual increase in coffee labour demand, associated principaly with the increases in production. There was an important increase in labour productivity, which countacted the increase in labour demand lowering the effect on employment. Additionally, employment required for uprooting during coffee bonanzas explain a very important part of the cyclical behaviour of labour demand in the Colombian coffee sector and the dramatic decreases in labour requirements in non harvest periods.

In these circumstances, the moderate increase in coffee employment shown by the figures, can be associated with what has been called a new phase of plantations. In response to high coffee real prices.

2. Coffee Supply

As a result of the modernization of its productive capacity, the Colombian coffee sector expanded significantly: in the last 20 years production increased from 8 million bags to 13 million. This expansion was specially due to the increase in international prices between 1975 and 1977, and to the substitution of old by new plants and the adoption of new technologies, and is not somuch associated

with the increase in the area planted. This area has remained stable from 1979 until nowadays, fluctuating around 1 million hectares.

From 1984 to 1986, as a result of a gradual but continous decrease of the real producer price of coffee and the expansion of the rust disease, Colombian coffee production started to fall. This trend reverted 1986 as a consequence of a new increase of the international price that was transmitted internally through a new increment of 23 percent in the producer price in real terms. In 1986/87 this increment was of 20 percent. These increments in price stimulated new plantations and uprootings.

At the same time, credit for these uprootings and new plantations increased by 290 percent in 1987 and 70 percent in 1988 with the resources provided by the 1986 bonanza. Also there was a free distribution of copper oxichlorane by the National Federation of Coffee Growers (FNC) to attack the expansion of the rust disease. This combination of policies had favourable effects on productive capacity. Experts have predicted that this will probably result in an increase in the Colombian coffee supply from 1990 to 1995.

These predictions are based in the following facts:

1) There was a sustantial increase in new tree plantings and new plantations between 1986/87 and 1987/89 with respect to their

levels in the past, specially the period 1981/1982-1984/85: The yields increased five times in the first period and only 3.7 times in the second.

2) The technified plantations now dominate the coffee sector. Predictions for 1989/90 crop year are a participation of this type of production units in total area planted of 57 percent, and in total production of more than 70 percent. Before the 1976 bonanza this participation was below 15 percent.

3) The Colombian coffee sector has now younger plants with an average age of 5 to 10 years old. In crop year 1989/90, 61 percent of the trees planted will be less than 5 years old. This will have an effect on production after 1993.

3. Production Policies

a. Research and Development

Since the late 1930s, the FNC has considered one of its principal activities the technological development of the Colombian Coffee Sector[17/]. However, it was not until the early 1960s that the rural extension service was created. This service the parpose of was to attend all aspects of the technology transfer and diffusion in the Colombian coffee regions.

17/ Palacios (1983).

All research and development activities are coordinated by the Coffee Research National Centre (CENICAFE) and the Coffee Chemical Laboratory (LQC).

Since the 1950s the process of generation of agricultural technologies has been constant, but its diffusion dates from the middle 1960s. Once the structure of technical services was consolidated, a process of modernization of the Colombian coffee sector began.

During the seventies most of these services were oriented to the renewal of coffee trees of traditional varieties, replacing them with the CATURRA. Campaigns to increase the density of cultivation, to eliminate shadow trees and to increase the use of modern inputs were put in effect.

b. Producer Price Policies

The main instrument that has been used in Colombia to regulate coffee supply has been the producer price of coffee. This variable has a great effect in the investment decisions of the coffee producer.

c. Credit and Input Subsidies

Since 1967 the FNC has developed an aggressive policy of subsidized credit directed to stimulate new tree plantings, uprootings and diversification away from coffee. Most of the resources are from the Caja de Credito Agrario, the Banco Cafetero (Privately Owned), Fondo Financiero Agropecuario (Managed by the Central Bank) and Coffee Producer Cooperatives.

During the coffee bonanzas of 1975 and 1986 an important part of the resources saved were used to capitalize these funds and institutions. During the 1970s coffee authorities decided to orient all efforts to modernize the coffee sector. In the 1980s the strategy was to renew all technified coffee plantations that were planted after 1975 and that were at the end of their productive cycle. This is why at the end of 1986 the credit for new tree plantings and stumping, that until then had decreased substantially, increased in real terms in 290 percent. New increments were observed in 1987, 1988 and 1989.

Credit for new tree plantings has an interest rate of less than 5 percentage points than the rest of agricultural activities, and there are almost no fund limitations.

Since the 1975 coffee bonanza, the FNC has implemented a policy oriented to provide the coffee producers with modern inputs.

The principal instrument has been to subsidize prices below the market clearing levels (72 percent on average)[18/]. This strategy implies a great subsidy to the modern part of the sector, that uses intensively these type of inputs. In 1988 the value of the subsidy represented almost 4 percent of the total value of the coffee harvest. The funds for this subsidy come from the National Coffee Fund, administered by the FNC asitwas explaimed in Chapter II. Total sales of fertilizers doubled during the 1980s, and increased specially during the 1986 bonanza. Between 1986 and 1989 these sales have increased at an annual rate of 10 percent.

Aditionally, since the end of the 1970s, the FNC has been involved in a program to attack the coffee rust. This program combines educational and publicity aspects with subsidies. Most coffee trees have been substituted with more resistant varieties (COLOMBIA variety). Pesticides to attack the disease are distributed freely and the producer is given some cash to use in its application. In 1988 the subsidies implied by this program costed almost 4 percent of the value of the coffee harvest to the National Coffee Fund. In the second half of 1989, due to the dramatic fall in international prices, this subsidy started to be dismounted.

Labour policies in the coffee regions are almost non existant in Colombia. Because there is a regular supply of labour in these

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18/ See Asesores (1990).

regions no specific instruments are needed as in the case of Costa Rica.

D. PRODUCTION MODELS

A supply model for a perennial crop such as coffee usually takes into account a longer time horizon of cultivators. Accordingly, it is useful to separate the productive (potential) capacity component from the current production component of the sector supply. In this section we have first summarized a series of production models that other authors developed for the three nations considered in our analysis and from their results some peculiarities of the coffee sectors in each of these nations are highlighted.

In Guatemala there is very little interventionism of the public sector in coffee production. This fact is reflected in the model that will be summarized in this part of the Chapter, and that was developed by Masters (1985). Longer term expectations on the behaviour of international prices influence investment decisions, which ultimately determine productive capacity i.e. bearing tree stocks[19/]. This equation states that productive capacity as

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19/ The investment equation is of the form:

BTRS = f(DNBRTS(-3), PAV(-3))

where,

BTRS: Bearing tree stock

(continúa...)

TABLE 3-12. GUATEMALA, COSTA RICA AND COLOMBIA: MODELS

Country	Investment Equation Dependent Variables	Independent Variables	Lg	Current Production Eq. Dependent Variables	Independent Variables	Lg
Guatemala	Change in bearing tree stock (DBTRS)	-Proucer price (P)	-3	Volume of coffee exports (QEX)	-International prices (PRX)	-1
		-Change in non bearing tree stock (DNBTRS)	-3		-Bearing tree stock (BTRS)	-1
					-Change in inventories (DINV)	0
					-Biannual cycle (BIA)	0
Costa Rica	Change in bearing tree stock (DBTRS)	-Two year moving avg producer price (PMA2)	-6	Volume of coffee production	-Potential production (Q*)	0
		-Dummy 84 (D84)	0		-Three year moving avg. producer price (PMA3)	-2
					-Dummy 85 (D85)	
					-Biannual cycle (BIA)	0
Colombia	Areas under:			Volume of coffee production	-Potential production (Q*)	0
	Replantings	-Producer price (P)	-1		-Producer price (P)	
		-Credit (CR)	0		-Fertilizer's price (PFER)	-1
	Uprooting	-Producer price (P)	-1		-Climate (CLIM)	0
	Stumping	-Producer price (P)	-1			
		-Trees more than				

measured by the "bearing tree stock" in the relevant period is a function of new tree plantings and price expectations, based on the average producer price lagged three years.

In turn, current prices in the international market influence the decision as to how much to harvest or produce in the current period (Table 3-12)[20/]. The hypothesis underlying this last equation is that the practice of performing a full harvest, given the existing stock of producing trees, is largely determined by output and factor prices. Production decisions are made early in the coffee season based on one year lag prices. Notice that the author takes the international price of coffee after taxes converted into quetzales as the relevant price. This is one of the main differences with the models developed for Costa Rica and

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[19](...continuación)
DNBTRS: Change in non-bearing tree stock
PAV: Average producer export price.

For which he obtained the following statistical results:

BTRS = 963.32 + 0.6459 DNBTRS(-3) + 1.1196 PAV(-3)
(5.56) (2.22) (2.04)

R2 = 0.98, D.W. = 1.11, sample: 1964-81

[20/] i.e. in equation form:

QEX=f(PRX(-1), BTRS(-1), DINV, BIA)
where,

QEX: Coffee exports
PRX: Proxy variable for sector profits
BTRS: Bearing tree stock
DINV: Change in producer held inventories
BIA: Biannual Tree Cycle

Colombia, and is due to the fact that in Guatemala there is a direct transmission of international prices to the coffee producer. The number of bearing trees is given and productive capacity is fixed, imposing an upper limit on production in the current period. The amount exported in the current period is influenced negatively by the change in producer held stocks and the so called biannual cycle that captures the tendency for good harvests to be followed by bad ones, and viceversa[21/]. As in the case of the investment equation, the author obtained good statistical results in his estimations of the current production equation[22/], confirming the expected relationships between export prices, tree stock, changes in inventories and the biennial cycle on sector output over the period.

The supply response model that was estimated for Costa Rica was developed by Jaramillo (1989). The main equation is a coffee investment equation in which the annual change in the number of bearing trees is determined by the two year moving average of real producer price and a dummy variable that takes a value of 1 in 1984/85 and 0 in the rest of the period (Table 3-11). This equation

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21/ The variable BIA was calculated using the following equation:

BIA= QEX(-1)/(QEX(-2)

22/ The statistical results were as follows:

QEX=	-759.79 +	550.24LPRX(-1)	+2.73BTRS(-1)	-0.98DINV	-482.0BIA
	(-1.86)	(5.14)	(11.9)	(-4.4)	(-3.2)

R2=0.88, D.W.=2.17, sample:1961-1984

indicates that investment in coffee trees, as proxied by the change in bearing trees, is positively related to long-run price expectations, proxied by the moving average of prices. The long lag needed for the price variable (-6) is due to the lag of four to five years between planting and the first harvest exhibited by coffee trees. In years where the change in the tree stock is negative, the equation suggests that the uprooting of coffee trees is negatively related to long-run price expectations[23/].

Once annual investment levels are determined, the number of trees of bearing age for each year was calculated using the identity BTRS = BTRS(-1) + DBTRS. Then, a third equation defined potential production as the product of the number of bearing trees and the average productivity per tree (Q* = BTRS. AP, Q*: potential production and AP: average productivity of one coffee tree). The increasing trend in the production data suggests that the average productivity has been increasing in the period 1960-88 in Costa Rica. The annual rate of growth has been estimated at 1.9 percent per year[24/].

23/ The statistical results that Jaramillo obtained for his investment equation can be summarized as follows:

DBTRS = -9.91 +0.004 PMA2(-6) + 32.2 D84
(-2.71**) (4.20**) (6.6**)
R2= 0.84 D.W.=1.64 sample:1971/72-1988/89

24/ Assuming a constant rate of productivity growth:

QPt = BTt. p. ert

(continúa...)

The final relationship is the production equation, where both long and short-run factors establish the size of the harvest that depends on PMA3 the three year moving average of real producer prices, the biannual cycle, and a dummy variable that takes a value of 1 in 1985/86 and 0 in the remaining years. As expected, the estimation suggests that annual production is dependent upon potential production and price expectations and that when producers expect high harvest prices they engage in short-term output increasing activities such as increasing fertilizer applications and/or intensifying weeding. The biannual index, BIA, is defined as in the Guatemalan model. The dummy accounts for the unusually bad harvest of 1985/86 caused by excessive rain and the spread of coffee rust[25/].

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[24](...continuación)
where p is the productivity in a base year and r is the annual rate of growth of p. Taking logs and rearranging yields and estimation equation for r:

log (QPt)- log(BTt)= log(p) +rt

To estimate r, the unknown QPt is proxied by actual production.

25/ The statistical results obtained by Jaramillo for his current production equation are:

Qt= 142.6 + 1.04 QP + 0.096 PMA3(-2) - 478.4 BIA -
(0.59) (9.59**) (3.45**) (-2.95**)

771.8 D85
(-4.24**)

R2=0.91 D.W.=1.54 sample:1970/71-1988/89

Three different production models have been estimated for Colombia by Zambrano (1984), Leibovich (1986) and Ocampo (1983) and summarized in Asesores (1989). These models consist of the following basic common elements: (a) a set of equations that estimate the areas under new plantations, stumping and uprootings, i.e., the investment equations; (b) the register and updating of the areas planted with coffee using traditional and modern techniques, resulting from the estimations of the equations described above and their respective past history; (c) productivity curves[26]/ of the coffee planted areas, discriminated by age; (d) a calculation of "potential" production (or "normal"), resulting from multiplying the area projections for each type of coffee by its productivity; and (e) the estimation of the current production equations.

Three investment equations represent the long-term part of the model, and are used to project potential production[27]/. As in the

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26/ There are three different productivity curves developed by the three authors mentioned.

27/ The following are the statistical results obtained in the estimation of those equations:

RA= -6977 + 0.687 Pt-1 + 8.724 CR
(-0.938) (1.849)** (7.62)***

R2 = 0.826, D.W.=1.51

NCA= -18389 + 1.464Pt-1
(-3.467) (2.128)**

R2=0.83, D.W.=1.82

(continúa...)

model developed by Jaramillo for Costa Rica, this potential production (Q*) is included in the short-term equation of the model that represents current production. Three different specifications of the latter were also estimated, each one corresponding to a different productivity curve (Zambrano, Leibovich, Ocampo, respectively)[28]/. Notice that in the case of Colombia the Biannual cycle is not an important variable. This agronomic phenomenon is almost non existant in Colombia. Instead, chnages in climate appear to play a more important role in the behaviour of coffee current production.

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[27](...continuación)
Z=12274 -0.804Pt-1 + 0.098AGE
(2.123)** (-2.5)** (6.365)***

R2= 0.884, D.W.=1.46

where,
RA: the area subject to replantations, i.e., area that was planted with coffee already, and that is now being replanted
NCA: is new area planted with coffee, and
Z: is the area where stumping of coffee trees is a generalized practice.
Pt-1: producer price of coffee lagged one year.
CR: credit
AGE:trees with more than eight years of age.

[28]/ The following are the estimations that resulted for the current production:

Q= 1.290+1.221Q*+0.000686Pt-1-0.037PFERt-1-1.585CLIM

Q= -5.577+1.346Q*+0.000490Pt-1+0.006PFERt-1-1.507CLIM
(-2.2)**(11.7)*** (1.4)* (0.52) (-4.2)***

R2=0.96, D.W.=1.7

where,
Q: current production
PFERt-1: price of fertilizers lagged one year
CLIM: climate.

Although there are some basic differences in the specification of these three models, it is possible to make a comparison between their results, specially with regards to the price elasticities obtained in the long and short-run equations. This comparison, however, is only valid in the case of Colombia and Costa Rica, because in these two cases the independent variable is the real price. In the Guatemalan model the independent variable is the sector's profits, and this is why a very high elasticity (more than 500%) was obtained.

As it can be seen in Table 3-13, there is clear statistical evidence that long-term price elasticities are greater than short run elasticities in the model estimated for Costa Rica, contrary to the results obtained in the three models developed for the Colombian case. This could have to do with the more direct transmission of the international volatility of coffee prices to the producer in the first case. However, the very low elasticities obtained in the short and long-run for Costa Rica are surprising. At least, they question the importance that the price has on the producer's decisions. Apparently, only very dramatic changes in these prices have some effect on current production, and almost none in the investment decisions. Nevertheless, the influence of prices in current production seems to be greater than in the Colombian case.

TABLE 3-13. COMPARISON BETWEEN THE RESULTS OBTAINED IN THE PRODUCTION MODELS

Country		Investment Equation Price Elasticity		Current Production Price Elasticity
Guatemala		1.11 (2.04)**		550.24 (5.14)**
Costa Rica		0.004 (4.20)**		0.096 (3.46)**
Colombia	RA	0.687 (1.85)**	Z	0.0068 (1.686)**
	NCA	1.464 (2.12)**	L	0.000087 (2.03)**
	ZA	0.804 (2.50)**	O	0.00049 (1.40)*

Sources: See Text.
RA: Areas under replantigs
NCA: Areas undes new plantings
ZA: Areas under stumping
Z: Estimation using Zambrano (1984) productivity curve
L: Estimation using Leibovich (1986) productivity curve
O: Estimation using Ocampo (1983) productivity curve
*/ Significative at a 0.1 level
**/ Significative at a 0.05 level
***/ Significative at a 0.01 level

On the other hand, the long-run price elasticity obtained in the Guatemalan model is comparable with the ones that resulted for the other countries because the producer price was used as the independent variable in these estimations. As it can be seen, it resulted greater than one. This is very interesting because it suggests that investment decisions are very much influenced by the behaviour of prices in this case, in which total transmission is allowed. In comparison a very low long-run elasticity was obtained for Costa Rica, where a very complex price fixing mechanism exists. This system probably allows more price signals in the short run than in the long run to the producer, as these results suggest.

In comparison with Colombia, however, the long-run Guatemalan price elasticity is still lower than the obtained in all three models summarized in this study.

CHAPTER IV. COFFEE EXTERNAL TRADE

Introduction

The world coffee economy over the past three decades has experienced wide fluctuations in both production and prices. These movements reflect the variability of Brazil's production due to climatic conditions and the long-term production response of other coffee producers to higher coffee prices. With the decline of real coffee prices from 1955 to 1976, there was a gradual long-term decline in Brazil's production. In 1975 there was a severe frost in Brazil which caused world coffee prices to triple in real terms. The high prices during the period 1976-78 stimulated substantial increases in production in almost every producing country. Declining prices in the first half of the eighties had partially the opposite effect, destimulating production specially in African countries. Again at the end of 1985 a serious drought affected Brazil's production. As a result, prices rose by more than 75% in real terms. This of course stimulated production again in some countries.

At the same time, there has been a general trend towards a more competitive market structure as reflected in the market shares of producing and consuming countries. On the production side, Brazil has lost ground to other producers of coffee. While on the consumption side, the United States and Western Europe markets

appear to have reached saturation levels with markets in Eastern Europe and Japan gaining relative importance.

Dynamic changes in market structure have also been affected by the International Coffee Agreement (ICA) originally signed in 1962, renewed in 1976 and 1983 and broken down in 1989, between coffee producing and consuming countries. The objective of this agreement was to stabilize nominal coffee prices within an agreed upon range. Coffe export quotas were the principal policy instrument to maintain prices within this range. The agreement regulations were in effect from 1962 to 1972, when negotiations broke down as a result of discrepancies on wether to modify or not the price trigger mechanisms when the dollar was devalued. In 1975 after a long period of diplomatic negotiations a new agreement was reached. However, due to the 1975 Brazilian frost, coffee prices rose considerably and there was no need to resort to export quotas until 1980 when prices dropped to the established floor price. In 1986 quotas were lifted again as a consequence of the Brazilian drought and were reestablished in 1987. In 1989, however, the agreement broke down as a result of irreconcilable positions with respect to quota distribution among its members.

In this chapter we give a brief but comprehensive view of the situation of Guatemala, Costa Rica and Colombia in the international coffee market from 1967 to 1989. Although these countries grow different varieties of this primary product, they

are interrelated in many senses. First of all, the two varieties grown have somewhat high elasticities of substitution in consumer demand, as a recent study done at FEDESARROLLO has shown[29]/. Secondly, by the ICA regulations, behaviour of prices of the "Other Milds" group are the only set of prices taken into account to cut or expand quota limits of all three countries. And thirdly, different approaches to coffee policies have resulted in completely different trends in production and exports and totally different positions at ICA negotiations of the three nations.

The chapter is divided in three different parts, each of them corresponding to one of these nations. In each part six different topics are considered: trends in exports to members and non-members, size of quotas alloted to each country by ICA regulations, levels of carryover stocks, international prices and discounts to non-members and, finally, positions at ICA negotiations and perspectives of the three countries in the new free-market scenario.

A. GUATEMALA

Guatemala belongs to the so called "Other Milds" group of coffee producer countries, given the type of coffee it grows. This group is also conformed by the five Central American countries, Mexico, Dominican Republic, India, Ecuador, Peru and Papua New

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[29]/ Leibovich (1989)

TABLE 4-1

OTHER MILDS, COSTA RICAN, GUATEMALA AND COLOMBIAN
PARTICIPATION IN WORLD COFFEE PRODUCTION AND EXPORTS, 1967/68-1988/89

Crop Years	World Production (000 bags)	World Exports	Other Milds		Guatemala		Costa Rica		Colombia	
			Production %	Exports %	Production %	Exports %	Production %	Exports %	Production %	Exports %
1967/68	68323	53845	19.8	19.2	2.7	3.2	1.9	2.3	12.2	12.2
1968/69	61792	53146	20.9	18.0	2.9	2.9	2.0	2.1	11.9	12.3
1969/70	62214	53816	23.0	18.7	3.2	3.1	2.3	2.0	13.2	12.8
1970/71	67679	53326	22.5	17.9	2.9	2.9	1.9	1.7	11.5	11.9
1971/72	76041	58565	21.2	19.4	2.9	3.1	2.1	2.1	8.3	11.1
1972/73	74647	60257	21.9	23.4	2.9	3.4	1.7	2.4	12.0	10.4
1973/74	70204	57592	23.0	20.5	3.4	3.3	2.2	2.3	10.4	12.9
1974/75	78094	56970	24.8	26.5	3.1	3.9	1.8	2.5	10.2	13.2
1975/76	64354	58141	25.7	23.4	3.2	3.3	2.0	1.7	13.5	13.6
1976/77	64268	53315	26.4	25.7	3.9	4.1	2.1	2.3	14.8	10.9
1977/78	72254	57980	26.4	28.0	3.6	4.2	2.1	2.5	15.4	15.7
1978/79	30900	64785	25.7	26.7	3.5	3.9	2.2	2.4	15.7	18.2
1979/80	78126	61244	26.0	24.2	3.2	3.3	1.8	2.0	15.6	18.8
1980/81	90258	63534	22.7	23.9	3.1	3.2	2.4	2.7	14.5	15.2
1981/82	91089	65731	22.8	23.2	2.9	3.9	1.8	2.4	15.9	14.1
1982/83	90526	70018	26.0	25.5	2.8	3.1	2.9	2.6	13.6	14.0
1983/84	85722	68945	23.9	23.5	2.8	2.8	2.6	2.5	15.1	14.2
1984/85	88367	68879	25.0	25.4	3.2	4.5	2.9	.0	12.5	14.0
1985/86	82674	73531	22.0	26.9	3.2	3.9	1.6	2.2	14.2	16.7
1986/87	95803	73551	25.7	27.6	3.1	3.0	2.8	3.4	11.2	16.4
1987/88	96171	62675	22.8	23.5	3.2	3.0	2.3	3.1	13.3	14.5
1988/89	93925	68278	25.5	23.6	3.0		2.7	3.2	13.1	

Source: ICO

Guinea. It is the most numerous group entitled to basic quota by the ICA. In 1987/88 it represented 23.5 percent of total world coffee exports, according to official figures (Table 4-1).

1. Exports

Guatemalan exports represented on average 2.9 percent of total world exports from crop year 1967/68 to 1987/88. This share in world exports was very similar to the country's share in total world production (3.0 percent in the same period). These exports were very unstable during this period of time, fluctuating between 1.5 and 2.7 million bags per year (Table 4-2). It is possible to say, however, that Guatemala just maintained its relative position in the world market in this period of time.

The distribution of exports between the ICA member and non-member markets was different depending on when ICA quotas were or not in effect. However, it is possible to say that this latter market acquired greater importance for Guatemala in later years, as happened to almost all producer nations, showing a growing degree of indiscipline in the market, contravening the agreement rules. In the 1960s and 70s, sales in the non-ICA market accounted for 10.7 percent of all producer sales, while in the eighties this proportion rose to 14.2 percent. For the "Other Milds" group, exports to non-members in the eighties rose to 19 percent from an average 8.4 percent in the two preceding decades. Guatemalan

ABLE 4-2
ERS AND NON-MEMBERS 1967/68-1987/88
(000 Bags)

ther Milds				Costa Rica				Guatemala				Colombia			
embers	%	Non-Members	%	Total	Members	%	Non-Members	%	Total	Members	%	Non-Members	%	Total	Members	%	Non-Members	%
8709	84 %	1608	16 %	1231	934	76 %	297	24 %	1724	1511	88 %	213	12 %	6596	6139	93 %	457	7 %
8553	90 %	989	10 %	1112	923	83 %	189	17 %	1541	1539	100 %	2	0 %	6534	6015	92 %	519	8 %
9439	94 %	600	6 %	1067	1015	95 %	52	5 %	1697	1696	100 %	1	0 %	6874	6296	92 %	578	8 %
8830	93 %	693	7 %	1020	945	93 %	75	7 %	1563	1560	100 %	3	0 %	6331	5929	94 %	402	6 %
10356	91 %	1009	9 %	1240	1091	88 %	149	12 %	1811	1790	99 %	21	1 %	6487	6188	95 %	299	5 %
12641	90 %	1432	10 %	1456	1284	88 %	172	12 %	2051	2045	100 %	6	0 %	6255	6037	97 %	218	3 %
10911	93 %	872	7 %	1337	1279	96 %	58	4 %	1909	1885	99 %	24	1 %	7408	6864	93 %	544	7 %
13951	92 %	1154	8 %	1412	1351	96 %	61	4 %	2198	2143	97 %	55	3 %	7542	7093	94 %	449	6 %
12626	93 %	984	7 %	1017	959	94 %	58	6 %	1901	1893	100 %	8	0 %	7923	7445	94 %	478	6 %
12867	93 %	949	7 %	1224	1136	93 %	88	7 %	2164	2134	99 %	30	1 %	5793	5385	93 %	408	7 %
13541	93 %	1095	7 %	1305	1164	89 %	141	11 %	2185	2181	100 %	4	0 %	8159	7741	95 %	418	5 %
16205	93 %	1245	7 %	1562	1479	95 %	83	5 %	2557	2528	99 %	29	1 %	11831	11105	94 %	726	6 %
13767	92 %	1201	8 %	1241	1217	98 %	24	2 %	2012	2010	100 %	2	0 %	11540	10678	93 %	862	7 %
12412	86 %	1947	14 %	1588	1325	83 %	263	17 %	1923	1800	94 %	123	6 %	9033	8295	92 %	738	8 %
12372	83 %	2607	17 %	1555	1220	78 %	335	22 %	2468	1779	72 %	689	28 %	8985	8042	90 %	943	10 %
11937	71 %	4832	29 %	1735	1125	65 %	610	35 %	2004	1768	88 %	236	12 %	9174	8465	92 %	709	8 %
13095	80 %	3354	20 %	1783	1210	68 %	573	32 %	1976	1943	98 %	33	2 %	9969	9132	92 %	837	8 %
12557	72 %	4926	28 %	2088	1200	57 %	888	43 %	3119	1859	60 %	1260	40 %	9642	8725	90 %	917	10 %
16537	89 %	2040	11 %	1546	1278	83 %	268	17 %	2301	2300	100 %	1	0 %	11514	10834	94 %	680	6 %
18357	90 %	1935	10 %	2488	2241	90 %	247	10 %	2717	2716	100 %	1	0 %	12052	11145	92 %	907	8 %
11229	76 %	3529	24 %	1954	1193	61 %	761	39 %	2223	1612	73 %	611	27 %	9114	7717	85 %	1397	15 %

7.74	-2.29	6.57	-10.35	6.24	-51.03	-0.33	-13.76
1.86	12.16	0.51	24.11	-0.66	26.29	2.74	4.45
7.52	-5.95	1.17	-5.43	6.63	-80.48	7.73	-7.85
-38.83	82.38	-46.76	208.10	-40.65	61000.00	-30.76	54.02

exports to non-members accounted for only 1.6 percent of total sales between 1967/68 and 1979/80, but this participation rose to 14.4 percent during the eighties.

This type of behaviour was also reflected in the rates of growth of Guatemalan exports to these two markets. Between 1967/68 and 1972/73, when quotas were in operation (and prices rather stable), Guatemalan exports to members grew by 6.2 percent a year, while exports to non-members diminished strongly by 51 percent a year. The second period, from 1973/74 to 1980/81, when ICA regulation mechanisms were suspended as a consequence of the Braziliam frost, a completely opposite behaviour was observed: exports to members fell at a 0.66 annual rate and exports to non-members increased by an annual 26.3 percent. In the third subperiod, when world supply was restored, quotas were restablished and sales to the non-member market fell while to the member markets grew (by annual rates of 80.5 and 6.6 percent respectively). In the last period, from 1986/87 to 1987/88, quotas were again suspended because of the late-1985 Brazilian drought, and the same type of behaviour as in the late seventies quota suspension was observed. This time, however, the rates of decrement and increment were much greater: exports to member markets diminished at 40.7 percent, while exports to non-members increased by more than 60,000 percent. As it can be seen from Table 4-2, the same trends were exhibited by exports from all producers.

This behaviour shows an important aspect of the impact of the ICA regulation mechanisms on almost every country's exports: whenever quotas were in effect, the member market expanded at a very slow pace, reflecting the trends in consumption in member countries. As soon as regulations were lifted as a consequence of an external shock, the opportunities to expand sales were localized in the non-member market. The reason was that price differentials between the two markets decreased radically when quotas were lifted. When prices are almost equal in these two markets, it becomes less attractive to sell in the saturated markets of ICA consuming countries. As demand increases at a very slowpace and any increase in the supply could have a deppresive effect on prices in this market. In the non-member market, chances of deppresing the price in a non quota scenario are lower.

2. Quotas

Guatemalan annual quota was set to be around 1.8 million of 60-kilo bags on average during the period considered, equivalent to 3.2 percent of exports of members entitled to basic quota by the ICA. Eventhough after crop year 1976/77 the agreement stipulated that annual were to be assigned based on a combination of productive capacity and carry-over stocks in each country, from that crop year until 1987/88, in the years they were effective, they were assigned according to an ad-hoc formula, that depended on

the negotiation power of each country, rather than on statistical criteria.

Under the ad-hoc system, that is to say, before quotas were suspended in February 1986, Guatemala had a share of 3.44 percent of world exports to member countries. This allocation was approximately equal to the country's participation in world production. However, as can be seen in Table 4-3, only in the first part of the period analyzed, until 1970/71, quota limits were similar to Guatemalan exportable production. In the next part of the period, and specially during the eighties, these limits were below 85 percent of total domestic availability. This situation was even worse the last two years taken into consideration: in 1987/88 and 1988/89 quotas were about 65 percent of total exportable production.

For crop year 1987/88 quotas were alloted according to statistical criteria[30/]. There was a "political adjustment" allowed in order to diminish the differences between the new allocation and the one that prevailed in the past, under the ad-hoc system. As a result of this, Guatemala experienced a reduction of its share to 3.35 percent of world member exports given that its levels of carry-over stocks were low. This quota reduction had serious consequences for the country. Given that for each 0.1 percent decrease im exports volumes, export revenues decreased by

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30/ These criteria are fully explained in the next section.

US$890,000[31]/, the total revenue loss was of US$801,000, a 21 percent of total exports revenues. In that same year a formula for the quota distribution for the crop year 1988/89 was negotiated. The calculation method used was similar, with a small "political adjustment" still allowed. Verified stocks represented a greater proportion than in the 1987/88 system and because Guatemala still carry over stocks were at relatively low levels, faced a further reduction on its quota to 3.27 percent.

This last quota reduction, however, never came into effect, because of the application of the "selectivity mechanism"[32]/ that increased the participation of "Other Milds" in the world coffee supply at the expense of other varieties. This mechanism was in effect during 1988. Its application implied an increase of Guatemalan allocation to 3.36 percent during that year.

3. Carryover Levels

The main problem of Guatemalan coffee institutional organization is that it has never counted with enough resources to assure the financing of coffee stocks during the periods when ICA quotas have been in effect. Eventhough one of the main functions of the National Association of Coffee Growers (ANACAFE) is in theory

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31/ See Mc Sweeney (1988).

32/ This mechanism will be explained further in the next section (5) of this part of the Chapter.

to provide the growers with storage facilities, the lack of funds was always the main problem that prevented this institution giving them appropriate support. Until 1985 ANACAFE was financed with contributions of its affiliates. It was not until that year that an official tax of 1 percent was created in order to provide some funding for the coffee sector. Most of these resources, however, have been used for purposes different than maintaining stocks.

Although as was shown in Chapter 2, Guatemalan coffee production grew in this period at a rather slow pace, since the beginning of the eighties it was greater than the quota alloted. This disequilibrium resulted in growing carry-over levels (Table 4-4). In 1984/85 storage levels reached a record 34.3 percent of total domestic availability, up from an average 8 percent during the seventies. A historically high -affhough not sufficient to justify the Guatemalan quota- carryover level was again reached in 1988 as a result of the quota reduction implemented in the 1987/88 negotiation.

4. International prices and discounts to non-members

All the three countries considered in this analysis face international prices that are on average above the price faced on average by all producers, given that both Colombian Milds and Other Milds varieties are of higher quality. Nevertheless, of the three nations, Guatemala has had the lowest premium over this average

TABLE 4-4
COFFEE STORAGE EFFORT
(Initial verified stocks as percentage of total production)

	Colombia %	Costa Rica %	Guatemala %	All Producers %
1967	59.1	5.8	16.2	113.8
1968	74.6	2.4	7.4	119.7
1969	61.3	0.7	4.0	104.4
1970	65.6	16.0	4.7	82.8
1971	81.1	21.6	8.4	68.1
1972	39.7	40.5	13.7	69.0
1973	66.1	11.8	5.0	68.9
1974	40.5	15.5	12.3	56.0
1975	27.7	6.9	9.5	74.9
1976	19.0	13.1	2.3	58.2
1977	37.2	7.1	2.5	42.8
1978	44.4	5.9	5.0	41.2
1979	40.0	7.6		40.5
1980	28.8	4.5		33.0
1981	43.5	28.8	29.6	45.7
1982	81.2	10.6	26.8	54.7
1983	87.1	43.0	37.6	63.3
1984	115.1	46.8	34.3	57.9
1985	104.1	104.9	7.1	61.7
1986	98.3	38.0	4.1	46.7
1987	59.3	42.2	1.5	49.6
1988	77.7	37.7	20.5	66.3

Source: ICO.

international price, as it can be appreciated from Graph 4-1. It is not very likely that this low premium has to do with substantial differences in quality between Guatemalan and Costa Rican or Colombian coffee, so a possible explanation is that external commercialization in the first of the three nations is less efficient. In the case of Guatemala, all external transactions of coffee are done by private agents. More or less thirty firms use different channels of commercialization, and all of them use the 'C' contract as reference price[33/]. There are no supply contracts, but usually discounts are given taking into account quality and shipment harbours.

Traditionally when ICA quotas have been in operation, prices to non-member market have been substantially lower than in the member market. The behaviour of price discounts can be explained by the very generalized practice of producer countries of placing their coffee surpluses -resultant from the growing disadjustments between exportable production and quotas imposed by the ICA- in non-member markets.

In Table 4-5 differences between implicit prices of sales to these two markets have been used as a proxy of actual prices to calculate average discounts given to non-member countries. As it can be seen, during the first part of the period when quotas were

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33/ The "C" contract is the futures coffee market. It is divided in three different quarterly positions: september, december and march.

in operation (1965/66 to 1972/73) world prices in the non-member market were on average 12 percent below. During the years when quotas were suspended because the agreement broke down and when the Brazilian frosts occured (1973/74 to 1980/81), price differences between these two markets decreased to less than 6 percent. Again, at the beginning of the eighties, when quotas were restablished, these differences increased and reached a record high of 46.3 percent in 1985. That same year was the Brazilian drought, so the agreement regulations were suspended; as a result prices in the two markets almost equated. In 1987/88 when quotas were again in operation, the price difference increased to almost 7 percent.

During the sixties and seventies Guatemala gave discounts that were on average below 20 percent. During the eighties due to the growing disequibria between quotas and exportable production, Guatemalan authorities had to make great efforts to place surpluses in the non-member market. As a result of this, average discounts increased to over 58 percent. In 1983/84 they reached a record high of 147 percent, as can be seen in Table 4-5.

5. Positions at the ICA negotiations

The eighties was a decade of confrontation among ICO member countries. The allocation of export quotas proved to be very difficult in a rapidly changing world environment. During the sixties and the seventies, when the market was recently organized,

the topic of quota distribution played a secondary role. In those years there was relative consensus on the criteria that should be considered to set these limits. Historical export performance and the political negotiating power of each nation were finally the two main aspects that prevailed in the final ad-hoc system that was implemented.

After negotiations broke down in 1972, few advances were made by countries to reestablish the agreement. It was very difficult to final a formula to counter act the effects that the dollar devaluation had on the agreement instruments, and that was acepted by both consumer and producer countries. There were also profound differences of criteria with respect to quota allocation among producers these differences were not however as tough as in the 1980s. It was not until 1976 that a new ICA was agreed upon, and a new allocation system was adopted. The combination of the following two basic criteria was used to calculate each country's participation in world exports:

a) Up to 70%, productive capacity (historic export performance and exportable production).

b) Up to 30%, is the level of carry-over stocks (to be verified by the ICO).

This system, however, did not apply immediately because precisely that year the Brazilian frost occured, international prices increased and the agreement regulations were suspended until 1980.

In 1981/82 the quotas had to be distributed again according to the system designed by the 1976 agreement. Nevertheless, things had changed so dramatically in the structure of world production, that it was very difficult to reintroduce this allocation rule. Not surpisingly, countries that had a very dynamic trend in production and those that defended their historical participation had totally opposite positions that were difficult to reconcile. During the 1982 International Coffee Council sessions, a group of eighteen countries led by Brazil, presented a quota distribution scheme, for the next five years, that affected seriously the Colombian market participation. On this occasion, Guatemala supported the Brazilian proposal. Finally, the scheme was not adopted and Colombia and Brazil maintained their relative positions in the market until 1985.

At the end of 1985, regulations were again suspended when prices rose sharply as a consequence of the Brazilian drought. At the beginning of 1987 world supply of coffee was restored to its normal levels, so a meeting of ICA members was promoted to discuss the restablishment of quotas. At that meeting, the Guatemalan position was not deliberative. Negotiators from that country did

not even become a part of the group of eight countries that presented the proposal of expanding their quota at the expense of some African nations that had lost participation in the world market. This group was led by Costa Rica and conformed by the Dominican Republic, Ecuador, Honduras, India, Indonesia, Papua New Guinea and Peru. All but Indonesia, members of the "Other Milds" group of producer countries. The other three members of this group, Mexico, Salvador and Guatemala, joined by Cote d'Ivoire, supported another proposal in which they implicitly accepted a potential reduction of their basic quotas. The Guatemalan potential reduction was about 21.3 thousand bags per year. Finally, no agreement was reached at that meeting.

In the second half of 1987 ICO members organized several meetings to keep discussing the renegotiation topics. Mexico hosted the first "Other Milds" producers meeting in September. At that meeting, Guatemala joined the group's position, by which they demanded an expansion of their alloted quota. This proposal was presented to Colombia and Brazil, but they decided not to support it. At the end of that same month the ICO Council met in London, and the "Other Milds" position was again put forward. The group was confident that the Africans would finally recognize that they had lost participation in the market and accept a lower quota limit. But the Africans hardened their position and no agreement was reached. When negotiations were about to break down, a new group, supported by the consumer nations, presented another proposal that

was based on the application of the so called "objective" criteria to allocate quotas. A "political adjustment" was allowed in order to cut down the differences between the new allocation and the one that prevailed in the past, under the ad-hoc system. This proposal was accepted by all producer nations. The application of these criteria at the end favoured the "Other Milds" group as a whole, because it represented a small expansion of their quota. In the case of Guatemala, however, its participation was reduced.

At that same meeting the allocation for the 1988/89 crop year was also negotiated. Negotiators agreed to apply the same objective criteria. The global quota, however, had to be ratified at the beginning of 1988. At the ratification meeting, there was a new confrontation among producer nations. At that time, price differentials between mild and other varieties were at an all time high as a consequence of a shift in world demand towards high quality coffee. As a result of this, consumer nations demanded an expansion of the quota alloted to all types of mild coffee. "Other Milds" producers exploited this situation and supported the consumer nations in their demands. After a great debate, it was agreed to adopt what was called the "selectivity mechanism", based on the principle that the international market was short of high-quality coffee. Price "trigger" mechanisms were tied up to the evolution of price differentials. If they exceeded a certain level, the participation of mild coffee in world supply would increase. This increment was to be distributed among high-quality producers

E 4-5
ES OF COFFEE EXPORTS TO MEMBER AND NON-MEMBER MARKETS
cents/lb.)

Costa Rica			Guatemala			All "Colombian Milds" producers		
plicit prices to members	Implicit prices to non members	Percent difference	Implicit prices to members	Implicit prices to non members	Percent difference	Implicit prices to members	Implicit prices to non members	Percent difference
44.4	42.1	-5.46 %	42.7	35.7	-19.61 %	45.7	42.9	-6.53 %
40.5	31.5	-28.57 %	38.8	34.3	-13.12 %	40.8	35.5	-14.93 %
39.0	29.9	-30.43 %	37.6	28.6	-31.47 %	39.8	36.5	-9.04 %
37.0	32.9	-15.63 %	36.7	29.9	-22.74 %	38.9	36.4	-6.87 %
47.7	47.6	-0.21 %	47.3	40.3	-17.37 %	51.2	51.2	0.00 %
44.7	45.0	0.67 %	44.3	36.8	-20.38 %	47.4	43.4	-9.22 %
43.3	29.9	-44.82 %	42.3	22.4	-88.84 %	47.2	40.5	-16.54 %
53.6	41.8	-28.23 %	56.4	39.8	-41.71 %	61.7	53.7	-14.90 %
66.0	63.6	-3.77 %	66.1	54.1	-22.18 %	68.2	69.1	1.30 %
53.4	53.8	0.74 %	52.5	45.4	-15.64 %	64.1	62.1	-3.22 %
94.4	84.1	-12.25 %	83.7	75.0	-11.60 %	102.1	108.3	5.72 %
206.1	232.9	11.51 %	174.4	186.3	6.39 %	220.0	223.4	1.52 %
176.8	176.5	-9.17 %	170.7	182.6	6.52 %	183.6	178.4	-2.91 %
136.9	130.4	-4.98 %	132.6	128.2	-3.43 %	150.7	149.1	-1.07 %
178.0	177.8	-0.11 %	168.5	172.4	2.26 %	171.8	170.4	-0.82 %
121.3	90.0	-34.33 %	121.1	92.4	-31.96 %	127.0	118.6	-7.08 %
131.0	76.7	-71.92 %	128.9	73.4	-75.61 %	132.5	113.4	-16.84 %
122.1	52.2	-133.91 %	120.8	63.4	-90.54 %	119.5	114.0	-4.82 %
134.5	55.5	-142.34 %	131.9	53.0	-147.17 %	131.7	124.0	-6.21 %
133.4	71.6	-86.31 %	128.9	67.8	-90.12 %	129.0	120.4	-7.14 %
185.2	133.7	-38.52 %	161.3	144.8	-11.40 %	168.6	190.1	11.31 %
123.5	127.7	3.29 %	120.9	99.4	-21.63 %	112.1	119.7	6.35 %
130.4	103.0	-26.60 %	117.7	118.0	0.25 %	119.8	127.4	5.97 %

according to their initial allocation. This "selectivity mechanism" implied an effective increase of the original quota for all "Other Milds" producers as a group, and for Guatemala, individually.

The selectivity mechanism, nevertheless, introduced serious distortions in the world coffee market. It discriminated against robusta producer nations. And at the end it did not benefit other producers: for mild coffee producers the effective quotas that resulted were still way below their exportable production.

The agreement had to be renegotiated in 1989. The controversies that emerged in past negotiations came up again in the 1989 agenda. However, the debate seemed to concentrate in two specific points: a new agreement should give solution to the dual market (members and non-members) and the allocation of "Other Milds" producers. This approach left aside other problems like the allocation of robusta producers (Indonesia, for example), and the growing carry-over stocks. The EEC presented a proposal to eliminate the dual market by adopting a "universal quota", aplicable to both member and non-member countries. At the beginning, this proposal was rejected unanimously by the producer countries, arguing that it would have a deppresive effect in world prices, but then as producer countries undustood that the consumer nations would retive if the dual market was not eliminated, decided to support the universal quota proposal it was more or less accepted. The issue of the allocation of "Other Milds" producers

was impossible to solve, and finally it led to the break down of negotiations.

The collapse of the ICA will have serious consequences for almost every country, according to expert predictions[34]/. So far, the immediate effect of it was a decrease in prices by over 45 percent from May 1989 to January 1990. The levels of prices today are at a historic record low. For most countries this behaviour of prices has obliged them to place increasing quantities of coffee in the world market allnough the deppresive effect that such strategy has on the international price. Guatemala, for example, increased export volumes by more than 60 percent from July to November last year. This increment was even greater than the one experienced by the "Other Milds" group as a whole, which was 43 percent over this same period.

Eventhough Guatemala has increased substantially its export volumes to the world market in an attemptto compensate the un favourable effect then lower prices has had on export renueves, estimations provided by Ocampo and Córdoba. (1990) based in ??????? model show that revenue losses associated with the collapse of the agreement have been substantial. According to these authors, the loss from June to November 1989 revenues was of 19.1 percent with respect to a hypothetical situation in which ICA regulations would

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34/ See, for example, Akiyama and Varangis (1989).

have been in operation. In the medium to long run revenue loss could ease (II percent) a result of future an increase in prices.

In the long run, however, the export revenue loss will not be substantial, as most of the projection models constructed to explain the international coffee market (Akiyama and varangis, 1988) show in the long non ad world production responses to lower prices in the short run. In these models prices are expected to increase gradually. This result supports the hypothesis that the ICA, in the long run, tended to stabilize rather than increase export revenues of its participants.

Nevertheless, in the short and medium run, the new free-market scenario is going to have great redistributive effects among producer countries. It is very likely that with this new regime Guatemala (together with El Salvador, Ecuador, Republica Dominicana, Honduras, Kenya, Peru, Ethiopia, Tanzania, Zaire, Uganda and Philippines) will have increments in production in the long run, while in the short and medium runs, it will have a negative effect on productive capacity.

Another aspect of the new market situation is if countries are loosing money exporting at the prevailing world prices in comparison to their costs. In Table 4-6 this comparison can be seen. According to these figures, Guatemala has had a very small but positive margin over total costs (of 1.42 percent) in the new

TABLE 4-6

COMPARISON BETWEEN PRODUCTION COSTS AND INTERNATIONAL PRICES
-ALL ARABICA PRODUCERS, COLOMBIA, GUATEMALA AND COSTA RICA-

	Total Production Costs US$cent /lb. 1987/88	Variable Costs US$cent /lb. 1987/88	Implicit International Prices US$cent /lb. 1987/88	International Prices US$cent /lb. Feb.16,1990
All Producers (Arabica)	77.11	46.79	127.40	62.00
Colombia	89.74	62.16	130.40	93.00
Costa Rica	78.89	45.94	103.00	84.98
Guatemala	89.09	53.34	118.00	84.98

Source: Calculations based on a world survey of coffee production costs -not published- and ICO.
Implicit international prices are calculated by dividing to value of each country's exports to member countries by their respective volumes International prices of All producers, Colombia, Costa Rica and Guatemala are the ICO-indicative, Colombian Milds and Other Milds (N.Y.) prices reported by the ICO.

market situation, although it has fallen by more than 45 percent from May 1989 to February 1990. This small margin is, however, probably insufficient to cover transportation and commercialization costs, which are not considered in this cost estimation (in the case of Colombia these account for more than 10 cents per pound). The comparison against variable costs is also very interesting because if prices were below this component of total cost, the country should stop producing coffee in the short run, as microeconomic theory states. As it can be seen, there is still an important margin, of over 30 percent. In summary, although Guatemala will probably face a better position in a free world coffee market in the long run, in the very short run the scenario is not very stimulating. These circumstances make it difficult to understand the hard position that the country adopted in the last negotiation that finally led to the collapse of the ICA. On the other hand if may suggest then the country has a long view of the market and if expects higher returns in the long run.

B. COSTA RICA

1. Exports

Costa Rica also belongs to the "Other Milds" group of producer countries. Its coffee exports represented an average 2.4 percent of total world coffee exports over the period analyzed. This participation increased almost one point from the seventries to the

eighties, revealing the very dynamic trend in production (the country participation in world production increased by more than one percentage point).

Asin the case of Guatemala, the distribution of Costa Rican exports between member and non-member market has varied according to the lapses of time when quotas have been in effect. However, the non-member market has grown its importance as a result of the efforts made by the Costa Rican coffee authorities to place their growing coffee surpluses in the international market. They have expanded sales to non -ICA member countries substantially, specially during the eighties. As can be seen in Table 4-2, non-member market sales accounted for 26.6 percent of total sales in the eighties, up from an average 9 percent during the seventies. This very high participaction of non-member sales has made Costa Rica together with India and Indonesia one of the most indisciplined countries in the ICA.

Also as in the case of Guatemala, Costa Rican exports to member countries have grown while sales to non-members have decreased when quotas have been in operation, while exactly the opposite has happened when these limits have been suspended, for the reasons explained before.

2. Quotas

It has been argued that one of the main reasons of this indisciplined behaviour of Costa Rica with regards to the ICA are the disadjustments existing between its exportable production and the quota alloted by the agreement. Table 4-3 shows the proportion of quota limits to exportable production. As it can be seen, the quotas have been lower than exportable production since the 1967/68 crop year, but the difference tended to increase during the eighties (the relation between quota and exportable production was as high as 60.2 percent on average). This is explained mainly by the rapid growth of coffee production while quotas assigned to Costa Rica stayed almost unmodified at the levels of 1 million bags a year. It is also interesting that for Costa Rica the situation was even worse than for the "Other Milds" producrs as a group. For the group as a whole during the eighties the proportion quota/exportable production was 63.7 percent on average.

As was previously set forth, in 1987 quotas were distributed attending to so called "objective criteria". Apparently, this didnot result in a solution to the growing disadjustments of Costa Rica, although it was one of the few countries favoured by the new allocation. In 1988/89 this country had a quota of 2.56 percent of total world exports while in 1980/81-1988/89 it was only 2.29 percent. In the last crop year, before tha agreement collapsed, its quota increased again as a result of the application of the

"selectivity" mechanism explained before, which was designed to supply the market with more high quality coffee. In the 1988/89 crop year the Costa Rican quota increased again to 2.64 percent of world exports.

3. Carryover Levels

As Guatemala, Costa Rica has very little coffee storage capacity. Nevertheless, production has been much higher than exports and this has resulted in record carryover levels. According to Jaramillo (1988) during the eighties, Costa Rican mills stored some 28.3 percent of domestic availability from one crop year to the next, up from 11.7 percent for the 1970's. A record carryover level was reached after 1985/6 harvest, when 36.8 percent of availability was stored in order to comply with ICA quota restrictions (Table 4-4).

The growing disequilibrium between exportable production and quotas assigned in the agreement has been aggravated by the fact that that individual private agents are banned by law from keeping stocks. ICAFE, parastatal but private agency, regulates all aspects relating to export permits and export and stock quotas. While ICA was in full operation ICAFE assumed the role of distributor of the ICA export stamps. Mills were alloted a share of the national quota based on their output over the preceding two years. Even in years

when the ICA export quota system has been unoperative, ICAFE has supervised closely all domestic and export transactions.

ICAFE also controls the amount of carryover stocks that mills are allowed to keep. According to Costa Rican law, mills are not allowed to carryover coffee from one crop year to another unless granted special permission by ICAFE. If a mill is found violating this law, the illegal coffee stocks must be sold at a domestic consumption auction. In the 1980s, the chronic surplus production over quota has forced ICAFE to extend permissions for carryover stocks almost every year.

4. International Prices and discounts to non-members

As can be seen in Graph 2, Costa Rican coffee implicit prices have been on average above all producers prices, specially in the eighties. The premium in this last part of the period analyzed has been very similar to the Colombian coffee premium. As in the case of Guatemala, in Costa Rica private exporters are in charge of all coffee commercialization. This coffee is sold to big brokers, without any supply contracts or specific discounts. Neither cash deposits or security stocks have been used. The reference price is nominated in fob terms, with a "price to be fixed" system based on the `C' contract second position (N.Y.). Additionally, sales to non-members do not have a preferential exchange treatment and they

should be approved by the Coffee Bureau (Oficina del Café), when they are done at other than minimum price fixed by this office.

An aspect of the Costa Rican indiscipline in the market are the considerable discounts given to non-members in almost every year of all the period considered. Again, as in the case of Guatemala, differences between prices given by this country in institutional and non-institutional markets increased during the periods when quotas were in operation, and decreased when they were suspended. During the eighties they reached 53 percent on average and in 1982/83 and 1983/84 crop years non-members were given discounts of over 100 percent (Table 4-5).

5. Positions at ICA negotiations

At ICA negotiations, since 1982 Costa Rica was part of dissenting group of producer nations demanding the expansion of their export quotas to reflect structural changes in world supply. At the beginning of the seventies, however, the Costa Rican position could not be identified with the "Other Milds" group as a whole, but more recently, as other countries have joined this position, this group is regarded as an independent unit at ICA negotiations. Since the beginning of 1987 Costa Rica became a leader of thes positions that demanded an expansion of the "Other Milds" allocation Costa Rica owns a very efficient coffee sector, that expanded very dynamically and this fact showd be recognized at

international level. At that time, however, Costa Rica used the that there had been structural changes in world demand that needed to be recognized (not supply). Large consuming nations supported the proposal which was seen from their perspective as an attempt to eliminate discount sales to non-ICA-members. The proposed quota adjustment would take place at the expense of the quotas of countries whose production had shown signs of weakness (mainly African countries). Costa Rican policy-makers were convinced that the size of their alloted quota limited the growth of the coffee sector and believed that the country would fare better in a quota-free enviroment relying on its reputation for good-quality coffee. The stalemate that resulted over the proposed distribution of new export quotas led to the suspension of the ICA's market regulation mechanisms in June last year.

Experts believe that Costa Rica is one of the best prepared countries to face the new free-market situation. Although the prices of "Other Milds" fell by more than all other prices (over 51 percent) from May 89 to Jan 90, Costa Rica increased its exports by 14.4 percent, and has been able to compensate almost completely the export revenue loss. According to Akiyama et alt. (1989), Costa Rica is in the group of countries that with Brazil, Colombia, Mexico, Indonesia, India, and Papua New Guinea has the best capacity of resisting a two year period of low prices in the international market, although this will represent a loss of 9 percent in its export revenues. In the long run, according to these

models, export revenues could increase by 5 percent in the free market situation.

On the other hand, Costa Rica has the greatest margin of price over production costs at the average level of prices that have prevailed since the agreement collapsed. Its total cost of production is just above 60 cents per pound. In these circumstances margins were positive from May 1989 to January 1990 -even when prices were at an all time low of 70 cents per pound-. Its average margin over total cost (not including international transport and commercialization) from May 89 to January 1990 was of 9.7 percent.

C. COLOMBIA

Colombia is the second world coffee producer, after Brazil. It dominates a group of countries that produce the "Colombian Milds" variety of coffee. Other members of this group are Kenya and Tanzania, but their participation accounts for less than 5 percent of the group's total production and exports. Because of the very strong position that Colombia holds within this group, the price of "Colombian Milds" is not taken into account to calculate the ICO indicative price in which the agreement trigger mechanisms are based. As a result of this, the expansion or cuts of the annual effective quotas of the "Colombian Milds" group are tied up to the evolution of the "Other Milds" price.

1. Exports

As Costa Rica, Colombia increased its participation in world coffee exports in the period considered. In 1967/68 Colombian sales to both member and non-member markets represented 6.1 million 60-kilo bags while in 1988/89 they had reached 7.7 millon bags. In terms of total world exports, Colombian participation rose from 12.2 to 14.5 percent during this period of time. According to production figures, the Colombian participation also increased substantially, specially after the mid-seventies Brazilian frost and then diminished a little, when quotas were again restablished, but still over the whole period, the Colombian participation tended to increase (Table 4-1).

Colombian exports to non-members have traditionally represented a smaller proportion of its total world coffee exports than in the case of Guatemala or Costa Rica. It is also very interesting to see that rates of growth of these exports during quota-suspension periods have not been as high as in the case of these latter countries. However, this market has gained some importance for placing surpluses in the last years, specially during crop year 1987/88, when 15.3 percent of Colombian sales were to non-member countries (Table 4-2).

2. Quotas

From 1968/69 to 1971/72 Colombian export quota was on average 5.5 million bags a year which represented 14 percent of total world exports. In the eighties this participation rose to 16.2 percent. Although the increment in the Colombian share was large, exportable production was still substantially above, so that this allocation represented less than 100 percent of domestic availability in almost all the period considered. This situation was very different from the one experienced by Guatemala and Costa Rica, which at the beginning were alloted quotas that were similar to their exportable production. As it can be seen in Table 4-3, only in the crop year 1968/69 were the quotas assigned to Colombia higher than its production levels.

In 1987/88 the so called objective criteria were put in operation and the Colombian allocation increased to 16.41 percent given the very high levels of stocks that were kept. The selectivity mechanism in 1988/89 increased this share again, this time to 16.57 percent.

3. Carryover Levels

One of the consequences of this disequilibrium between quotas and exportable production has been the very high levels of carryover stocks that the country has had to keep. The proportions

of initial verified stocks to total production shown in Table 4-4 are a very good indication of the effort that Colombia has made in participating in the ICA. Colombia has kept much higher stocks than Costa Rica or Guatemala, and during the eighties certainly higher than the average stocks of all producer countries.

A very complex institutional structure designed to keep this very high stock levels is one of the main differences with the other two countries considered. In the case of Colombia a structure of this nature is also necessary because of the size of the country in the international market. Because it is the second largest producer, it cannot afford to sell all its exportable production because of the deppressive effect on prices that this strategy would have. The best strategy for Colombia is to belong to the agreement and pay the cost of having to store growing stocks of coffee. This, of course, makes for a great difference with Guatemala and Costa Rica. As it has been shown, for these two countries it is a more profitable strategy to maximize their exported volumes even if this means contravening the agreement rules.

4. International Prices and discounts given to non-members

Colombian coffee has been considered of the best quality available in the international market. More recently, coffee grown in other countries, like Kenya, which are the same variety as

Colombian, have acquired a very good reputation internationally. At the same time, consumers of coffee especially in Western Europe and Japan have become increasingly quality conscious. As a result of this, as is shown in Graph 4-3, implicit international prices received by Colombia have been above the world average during all the period considered.

Colombian international coffee commercialization is done mainly by the National Federation of Coffee Growers (FNC), the agency which is in charge of all aspects of coffee policy. There is a small proportion of coffee also exported by private agents, but FNC dominates the international marketing of coffee. Traditionally, coffee supply contracts with all ICO-member countries have been the main instrument of the Colombian commercialization scheme. According to these contracts, the buyer (usually firms) shows its disposition to purchase from the FNC or private agents, indistintively, within a predetermined period, usually a year, an amount of coffee divided in equal proportions along the period in specific conditions and at a price that is fixed based on ICO indicative prices of Central American Coffee (Other Milds). Once the contracts are established at the beginning of the civil year, the FNC guarantees the total sale of the alloted quota for the crop year and a fraction of the first quarter of the following year. The quantity of coffee that the FNC sells to each buyer depends on the history of the commercial relations between the two parts, and on criteria like the general demand situation and the competition in

the market. These contracts mention specifically the reference price of each purchase, the protection against a fall in prices, the differential and the financing given to each buyer.

The FNC has a monthly program of sales in relation with quarterly quotas. The dates in which the roasters want to buy are taken into account to calculate the reference price. However, the rules to fix these dates have changed historically. In 1982, the european buyer had a maximum dateline of 15 days from the moment the transaction was anounced to establish the date of the effective purchase. In 1983 this was modified, and a new dateline was fixed on the shipment date, equivalent to more or less 45 days after the transaction was announced. In 1984 a new modification was introduced, and the reference price date was fixed the same day the transaction was announced. In the case of American buyers, the date is when the private exporter notifies the FNC about the operation.

The reference price has been calculated based on average ICO indicative price of Other Milds within the last 10 days before the effective purchase. More recently, a proportion of this price is fixed in relation with the second position of th 'C' futures contract (N.Y.).

Once the date when contract is valid has been determined, there is a period of time that passes until the coffee reaches its destiny. When the market shows a tendency to fall, the rational

buyer will wait more time before making purchases. To avoid this type of behaviour, the FNC accepts to pay the difference between the reference price and the average of prices after the transaction, if it is lower. This instrument is totally asymetric, it guarantees a discount if there is a decrease in prices, but the FNC does not profit when prices tend to increase.

Sales to Europe and Japan are given 45 days financing from the shipment date. The cost of this is implicitly included in the higher prices charged to these countries (See Ocampo and Leibovich, 1985).

The Colombian system differs from the ones used by Costa Rica and Guatemala in one aspect mainly: the use of supply contracts instead of direct sales to brokers. This commercialization scheme has not implied better prices for the Colombian Coffee in comparison with Costa Rican, but certainly it ansures a better behaviour in the regulated market.

The Colombian intentions of following the ICA rules strictly are reflected also in the way the country behaves with respect to the non-member market. As it was said already, sales to this market accounted for 7 to 15 percent of total world coffee sales only (while as for Costa Rica and Guatemala it has been 30 to 40 percent and 13 to 18 percent for all producers as a whole). Price discounts

in this market have also been substantially lower as it can be seen from Table 4-5. They've been, in general, less than 10 percent.

5. Positions at the ICA negotiations

Since the first ICA was signed, Colombia together with Brazil, played a very important role in promoting it. More recently, as Brazil has lost interest in this agreement, coffee exports represent a minor proportion of total exports and Colombia has had to lead at these negotiations.

In general, the Colombian position with respect to the agreement had been conciliatory, even at the expense of its own participation in the market. But Colombia has also been one of the main befeficianes of the quota distribution schemes implemented along the different agreements independently of the criteria used to calculate each country's share. At the beginning of the eighties, for example, Colombia managed to increase its alloted quota in almost two percentual points with the support of a major consuming nation, the U.S., with the argument that its production had grown substantially during the late seventies. Appart from the fact that the U.S. supported this increase, the opposition of other countries that also wanted an increase of their allocation was not very strong given the fact that Brazil's loss in participation gave enough room to attend their demands. Nevertheless, most countries

resented this episode and interpreted it as a sign of the great political prower that Colombia had in the market.

In 1987/88, again, when the "objective criteria" were first used to distribute quotas, the country benefitted with an increase in its quota, given the very high stocks that it kept. An when in 1988/89 the selectivity mechanism was adopted (most of this mechanism was designed by the Colombian negotiators), its allocation increased again.

At the 1989 negotiations, however, trying to preserve its allocation was very dificult, and specially with the pressure of countries like Costa Rica, Indonesia and India. At the 1989 negotiations, Colombia showed its great interest in maintaining the ICA economic provisions even if that signified a potential reduction of its allocation.

In a free-market situation Colombian is considered with Costa Rica to be in a priviledged position. At least Akiyama and Varangis (op. cit.) have included Colombia in the first group of countries with best capacity to resist a period of low prices in the world market, although in the short and long run the country will experience a substantial revenue loss. According to these models the revenue loss in the short run will be of 20 percent per year, and in the long run of 1- percent. Colombia however has increased its export volumes sustantially from May 1989 to January 1990 by

almost 25 percent, and this has compensated in a large part the decrease in prices of over 50 percent. The net revenue loss over this period has been of less than 15 percent.

As these authors put it, the Colombian response to the new market situation will be slow given that most of the impact will not be transmitted internally immediately.

The analyses of the international price margins over costs are not as optimistic. Colombian production costs are much higher than in countries such as Costa Rica, at levels near 89 cents per pound excluding international commercialization and transportation costs (Table 4-6). Under these conditions, unless the international price is above the one dollar barrier, the country is loosing on each pound of coffee exported. This doesn't mean, however that in the short run the country should stop producing coffee. The margin over variable costs is still significant. This of course means that the best strategy for the country to follow is to try to maximize its exported volumes, although this strategy has deppresive effects on world prices.

In the long, run, however, it is probable that the Colombian coffee sector is going to decrease in size and relative to other sectors of its economy. If prices in the international market continue to be at very low levels for a prolongued period of time, and this is transmitted internally, the long run trends in the

Colombian coffee production will be to diminish, given the relative high elasticity of investment in coffee to prices.

CHAPTER V. CONCLUSIONES

In this study three totally different cases of domestic transmission of fluctuations of an international commodity price have been compared, Guatemala is on one extreme: it can be characterized as a case of total transmission. Colombia is on the other extreme: a very sophisticated price stabilization system exists that isolates the producer from what is happening in the international markets in the short and medium run. Costa Rica, in turn, is in the middle: there is some internal transmission, but fluctuations in international prices are smoothed out by the use of different policy instruments.

This "degree of transmission" is usually correlated with a specific institutional organization in each of the countries studied. Where international price fluctuations are totally transferred to the domestic producer -Guatemala- coffee institutions and policy instruments are not developed, and at the same time, are very unstable. In turn, where there is a price stabilization system -Costa Rica and Colombia- it is usually accompanied by a very complex institutional organization, and a myriad of refined policy instruments.

At the same time, an interesting feature is that the evolution of the coffee sector in these three nations has been quite different, although they have similar agroecological conditions for

coffee growing. The Guatemalan coffee sector has remained stagnated, the Colombian has shown some dynamism -specially in the late 70s and early 80s-, but certainly the Costa Rican has been the most succesful of all. This is reflected not only in the very dynamic trend of coffee production and export -that has led to increases in the ICA quota alloted to the country, as it was shown in Chapter IV-, but in the astonishing results with regards to labour productivity, yields and production costs.

Although one part of the explanation of the Costa Rican superiority in productivity and costs, has been the relative success that the country has had in adapting high yielding varieties the fact that constitutes an intermediatea case with respect to transmission of international market signals to the domestic producers, seems very interesting.

From the theorical point of view, there are reasons to expect a more favourable productivity response from the internal producer that faces a situation in which he is not completely protected from the evolution of international prices. But commodity international prices seem to be so unstable, that usually for this type of producer is important to have some degree of certainty about future earnings and some support from the government or private organizations to make the necessary investments to increase productivity. These two statements support the hypothesis that in Costa Rica the best conditions are given for the a better

productivity response of the coffee individual producer, although the price fixation system has some problems in reflecting his real market situation.

The hypothesis that the Costa Rican institutional model leads to better results with regards to the performance of the coffee sector, however, supports greater presence of the public sector in the coffee economy. In fact, in Costa Rica the role of the public sector is more active than in Colombia and Guatemala. The salient feature about Costa Rican private and public sector mix, is that there is more competition between the private and public institutions that supply service to the coffee sector. This is very clear in what has to do with technological research and services. In contrast, in Guatemala the not very organized private sector has done very little to support all technological research activities. In Colombia, excessive concentration on one private institution, the FNC, seems to have been less effective: although some advances have been made in developing new rust resistant varieties, coffee annual yields and productivities are much lower that in Costa Rica and in recent years they seem to have fallen.

The coffee sector in Costa Rica receives substantial subsidies from the government although not as much as the Colombian coffee sector from the FNC. Again the comparison between these countries shows that more subsidies given for the utilization of fertilizers and other agrochemicals do not necessarily lead to increases in

productivity, given that after certain levels an increase in the amount used of these chemicals does not increase yields. In Costa Rica, for example, the amount of agrochemicals per hectare used is much lower than in Colombia (almost two-thirds) and yields are more than double. Another difference with Colombia is that the value of subsidies in Costa Rica is almost totally compensated with the great number of taxes that the coffee sector has to pay, in what can be considered as a more equitable relationship between the coffee sector and the rest of economic activities.

The Costa Rican coffee sector organization ???????? be regarded either as being the optimal system: many policy instruments and institutions have clear imperfections that do not seem justifiable. The best example of the imperfection of a policy instrument in Costa Rica is the producer price fixation -which is also the principal transmission mechanism-. The formula to calculate this price as it was explained in Chapter III takes into account the evolution of the international price, and in that sense does not isolate the grower from the international market signals completely, as it happens in the case of Colombia. But given that this price is paid through advances at different moments by the millers, the producer does not have certainty about his effective earnings. At the same time, this formula unfairly ensures a certain level of profits (9 percent by law) for the highly concentrated coffee processing activities.

Another problem of Costa Rican institutional system - which also applies to the Guatemalan- is that it is not designed to permit the country's adequate participation in the ICA. A high degree of descentralization of the different coffee producing and processing activities -that has proven to be beneficial with regards to production dynamism- has diluted the responsibilities with respect to all coffee storage activities, of great importance during periods when international export quotas are in effect. Mills are banne????? law to carry over stocks, and given that there is not a central agency with enough financial and physical capacity to keep these stocks, the producer is almost compulsed to sell all his production for internal consumption and export purposes, leading to a growing degree of indiscipline of these two countries in the international market. From the point of view of participating in the ICA, the Colombian institutional organization seems more appropriate.

Costa Rica has certainly earned its reputation of having the most productive and high yielding coffee sector in the world. This situation leads to the conclusion that probably is the nation that is best prepared to face a free-market situation after the collapse of the ICA. This of course does not mean that Costa Rica is better off in the free-of-quotas scenario with respect to its situation when quotas were in effect, as negotiators from that country considered during past year negotiations. As in the case of Colombia and Guatemala, the break down of the agreement will

represent an important loss in export revenues in the short and medium run. But due to the favourable production cost situation, the very low international prices will not unfavourably affect the Costa Rican coffee productive structure.

For Colombia, the situation is a bit more complicated: the low international prices will have a very important negative effect on export revenues, and given that coffee represents a much higher proportion of total export revenues this will also have grave macroeconomic consequences. At the same time the coffee production costs are substantially higher than in Costa Rica, and given prices of US$1.oo per pound in the international markets, this will probably mean a reduction in the relative size of the coffee productive capacity, as the most inefficient (high cost) producers leave the industry, and the most competitive ones remain in the medium run. The period of time that this adjustment will take will depend on the time that authorities will take in letting internal transmission. If no transmission is allowed, the cost will be represented in growing deficits of the National Coffee Fund that the rest of the economy will have to pay.

On the other had, the future of the Guatemalan coffee sector is very difficult to predict, although is the least clear of the three cases analyzed. Apparently, the country has maintained its position in the world market in the last three years only because there was a clear shift in demand towards high quality coffee.

Otherwise, it would have continued to lose participation in the international market. Its situation with respect to production costs is not very satisfactory, as in the case of Colombia. The technological lag is growing, and although in the very short run the country will remain in the international market, in the long run it is very probable that the coffee sector will not survive unless it receives greater support from the government. The process of disappearance of coffee in Guatemala, however, will not be done without important traumatisms, given the importance that this product still has in domestic production and employment.

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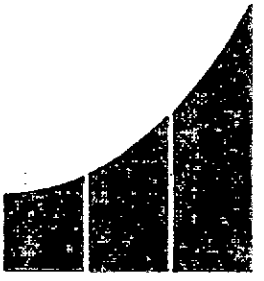

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