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CENTER DISCUSSION PAPER NO. 147

EXPORTS AND GROWTH IN THE IVORY COAST: TIMBER,
COCOA, AND COFFEE

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Since the end of the nineteenth century the economic fortunes of the Ivory Coast have depended on a succession of export crops. As along other areas of the West African Coast the most important exports in 1900 were palm oil and kernels. While exports of these products remained roughly constant until World War II, at which time they declined as the result of competition in supply from more profitable exports, the impetus for growth came from other sources.¹ For about ten years prior to the First World War natural rubber, harvested primarily from wild vines, was the most dynamic export, accounting for 45% of the total value of Ivoirian exports in 1912, but it was unable to compete with plantation rubber from Malaysia and exports virtually ceased by 1914. More important for the future of the Ivory Coast were shipments of timber which grew rapidly until, in 1929, they accounted for 31% of the total value of exports. Following Ghana's expansion by thirty years, exports of cocoa from the Ivory Coast grew rapidly during the 1920's to occupy first place, with 37% of the total, in 1929. As cocoa's fortunes slowly declined, relatively if not absolutely, during the next four decades, coffee became the leader, increasing continuously to account for 60% of all exports by 1954. But then, to come full circle, exports of timber, which had remained static since 1929, began to increase rapidly during the 1950's and 1960's and had overtaken cocoa in relative importance by 1963.

It is these last three products with which this essay is concerned. Together they accounted for 76 percent of the total value of exports in 1970 and for most of the 9 percent average annual rate of growth of real

exports over the past 25 years.² Our interest, however, is not just in the relative importance of these products but also in the insights provided by the ways in which they differ. The production of coffee and cocoa, for example, takes place almost entirely on small farms cultivated by Africans. The cutting of timber, on the other hand, is accomplished primarily by European owned and managed private companies which use relatively capital-intensive techniques and have many of the characteristics of mining enclaves.³ The type of capital investment required by coffee and cocoa on the one hand and by timber on the other also differ. Most of the capital which has gone into the creation of coffee and cocoa plantations has come from the labor of Africans who have cleared the forest, planted their trees, and tended them until after several years they begin to bear fruit. It is in the public area that sources of investment and foreign exchange have been important for the building of roads and port facilities. Forestry, a more capital-intensive operation to start with, has depended to a much greater extent upon foreign private investment for the purchase of trucks and other equipment and for the construction of feeder roads leading into the forest from government-maintained roads. Finally the development of coffee and cocoa exports has historically been constrained to a greater degree by demand factors than has timber whose main constraints have been those of supply.

It is the objective of this essay to see in which ways these and other differences have been related to factors promoting or inhibiting growth of the export sector and of the rest of the economy. For this purpose coffee

and cocoa will be treated together since they are produced under similar conditions, frequently by the same farmer. In the next section both supply and demand conditions as these have affected export growth will be discussed within their historical context. Thereafter, an analysis will be made of the quantitative impact of that growth on the entire economy. Most of the data for that analysis are taken from the period of the 1960's for which our quantitative knowledge of the local economy is much greater than for earlier periods. Where possible, however, an assessment of the implications of our results for the years prior to independence will be undertaken. In any case it is believed that the current situation cannot be adequately understood without some knowledge of the historical background.

I. A History of Timber, Cocoa, and Coffee in the Ivory Coast

A. Supply Conditions

At the time of colonization by France in the 1890's the Ivory Coast was to the Europeans a largely unexplored and unknown area which had been bypassed in favor of more promising centers in Senegal, Ghana or Nigeria. It was soon realized, however, that the forest area in the southern part of the colony especially was a rich natural resource capable of yielding or producing a variety of products. Yet there were a number of things which stood in the way of the development of this region. Foremost among these was at first the need to establish effective military and political control over the countryside to prevent violent conflict and to insure

the safe and free passage of traders.⁴ Other bottlenecks included the inadequacy of the transportation network, lack of localized knowledge of and experience in tropical agriculture, and the absence of a reliable supply of labor.

Transportation. One of the most rapidly growing exports, timber, though more accessible than in many countries, was nevertheless subject to high costs of transportation. For many years the primary means of transporting logs was by floating them down the rivers and across the lagunes to several ports along the coast. The largest of these was Grand Bassam, where logs were lifted out of the water by crane and into rail cars which carried them to the wharf extending past the surf where they were dumped and floated out to ships at anchor in the roadstead. In other areas they had to be rolled for several kilometers across land separating the lagunes from the sea and towed out through the heavy surf. In addition to these costly handling operations, loading depended on sea conditions, and long delays and high losses were frequent.

As the railroad was extended in 1903 northward from Abidjan new timber concessions tended to be located along this line.⁵ It was not until 1932, however, that the railroad was linked directly with a newly constructed wharf at Port Bouet, seven miles from Abidjan. By this time, though, the relatively high prices of the 1920's had given way to the depressed condition of the 1930's.

It was not until after the Second World War that the transportation constraint was, for a time, eased.^{6/} With the opening of the Vridi Canal

in 1951 and the construction of a modern deep-water port at Abidjan, costs of transporting timber were lowered to such an extent that many areas of forest previously unexploitable were now within reach. The result was an enormous expansion of production averaging at 15 percent annual rate of growth from 1950 to 1970. Timber camps continued to be concentrated near the railway and various waterways. for a time since truck transportation was still relatively expensive and was confined to feeding the railroad and lagunes. During the 1950's, however, public roads were substantially improved. As the areas near the railroad and waterways were depleted, the center of production shifted westward, and trucking directly to Abidjan became increasingly common. By the late 1960's, however, transportation distances were such that several species were expected to be no longer profitable within a few years. The construction of a new port at San Pedro in the southwestern part of the country, as part of the 1971-75 Plan, promised to extend timber production for several years, but it was nevertheless clear by 1970 that the frantic expansion of the previous two decades could not long be continued.

Transportation was less of a bottleneck in the case of coffee and cocoa, both of which have a relatively high value in relationship to their bulk. Short hauls of relatively small quantities could be accomplished by head portage and the lagunes and railway provided avenues for longer hauls. Still the introduction of the truck and the expansion of the road network during the interwar period opened up many new areas to production.

But it was the falling costs of transportation during the post World War II period which truly revolutionized agriculture in the forest region of the South. This was especially important after 1954 when the high prices received during the first decade following the war were sharply decreased. Even though the prices of many transportation inputs were rising, rates charged for hauling coffee and cocoa declined as a result of increased competition and improved roads. Furthermore, the extension of unimproved feeder roads to most villages, sometimes by the villagers themselves, eliminated the need for head portorage and greatly increased transportation capacity at that stage.⁷

Agricultural Knowledge. More important in limiting the early extension of coffee and cocoa production was the lack of knowledge and management skills necessary to grow these crops profitably. The skills required for timber cutting were imported with the European or African, usually Ghanaian, entrepreneurs engaged in that business. But the knowledge required for successful cash crop production in the Ivory Coast was more specific to that region and could not be so easily acquired.

The first coffee planted in the Ivory Coast was introduced by Europeans in 1881, but many of the early plantations suffered from a lack of knowledge of local conditions and poor management, and production remained primarily for domestic use for many years. Cocoa was grown only sporadically until promoted aggressively among African planters by the colonial government after 1908. In the meantime an experiment station

had been established at Bingerville and was conducting research on a variety of tropical fruits, trees, coffee, and cocoa as well as on soil structure and other basic agricultural conditions.⁸ By the early 1920's the Ivory Coast was producing cocoa of superior quality which found a ready market in France. Led by African planters and under the impetus of the expansion of road transportation, production of cocoa increased twelve times from 1920 to 1929. During the 1930's, however, the rate of expansion of planting decreased because of a decline in world prices and insect attacks. Production continued to increase fairly rapidly, though, as trees already planted came to maturity.

During the 1920's European planters spread the cultivation of several varieties of coffee throughout much of the southern part of the Ivory Coast. In 1929 an experiment station concentrating its research on robusta coffee was established at Man in the western part of the country. With the collapse of cocoa prices during the depression most Europeans who had followed the African in planting cocoa now concentrated on coffee, especially the gros Indénié variety which had been developed at the Bingerville experiment station and which was inferior in quality but ~~hardier~~ than the other principal variety, robusta. They were followed shortly by Africans, who, by 1932, had planted more trees than the Europeans. There followed a remarkably continuous rise in the exports of Ivoirian coffee from 405 tons in 1929 to 17,960 tons in 1939.

The technical problems of these crops were, however, by no means solved. Most of the varieties of coffee in the Ivory Coast, including

gros Indénié, were largely destroyed in 1949-1950 by tracheomycosis disease. Vast areas were replanted with robusta inéac, a variety imported from the Belgian Congo by the research center at Bingerville and which was resistant to the disease. The replanting program was financed through a coffee fund, originally established for purposes of stabilization but by this time directed toward aiding production, which received a rebate from the coffee export tax. This variety of robusta was less productive than previous varieties, however, and could not thrive in some of the dryer areas. The search for more productive robusta varieties was continued and by the late 1960's these efforts were having results. The 1971-75 Plan thus calls for the replanting of most coffee areas with selected varieties under intensive cultivation at the same time that the area planted to coffee is reduced because of constraints on demand to be discussed later.

Although cocoa experienced less severe technical problems than did coffee, having largely escaped the swollen shoot disease which devastated so much of the cocoa of Ghana, it was not without certain problems. The two principal difficulties after World War II were the age of cocoa trees, most of which had been planted during the 1920's and were well past their maximum yields, and the losses in production due to capsid insects. During the early 1950's these problems were attacked primarily by the provision of subsidies for uprooting diseased and planting new selected trees, the subsidies coming from a cocoa fund similar to that of coffee, and by the spraying of trees against capsids. The subsidies were abandoned in 1959,

however, because trees were frequently neglected after planting. The anti-capsid program nevertheless gained momentum in 1959 and was followed in 1962 by a program for cocoa regeneration. Both of these have been quite successful in raising yields. The 1971-75 Plan calls for future planting to be confined to a higher yielding hybrid variety which has been developed recently.

By the time of independence in 1960, it was clear that the Ivory Coast had greatly increased its knowledge of agricultural opportunities and its research infrastructure necessary to add to that knowledge.⁹ Experience had been gained in the cultivation of a number of crops over periods of up to fifty or more years. The fact that the production statistics for coffee hardly show the influence of the crippling effects of tracheomycosis attests to the speed with which the agricultural service was able to introduce a variety immune to the effects of that disease. What was also clear in 1960, though, was the lack of knowledge which existed concerning rural production in general, especially of food crops, and the lack of an effective infrastructure of rural extension services capable of bridging the gap between the results of the experiment stations and the practices of Ivoirian farmers.

Labor Supply. The particular mode of production of timber, coffee, and cocoa utilized by the 1950's was the result of the available technology and the relative endowment of the factors of production. We will distinguish four of these factors: highly skilled labor or management, modern capital equipment, unskilled labor, and land or natural resources. The first of

these inputs, the skills necessary to engage in modern methods of production, was very scarce in the Ivory Coast at the beginning of the colonial epoch but could be imported from Europe, albeit at a cost at least two times that of the same skills in Europe. Modern capital equipment, though equally as scarce, could be imported more cheaply than skilled manpower because, unlike human beings, machinery does not eat and drink imported goods or experience a painful change in climate. The last two factors of production were available in Africa, but, because of the low population density of the Ivory Coast, averaging 12.5 persons per square kilometer in 1965, land is more abundant than labor relative to most of the rest of the world.

The low population densities, characteristic of the Ivory Coast, have had several effects on the supply of labor. On one hand, where very extensive agricultural techniques were employed, labor requirements in terms of man-hours necessary to produce a subsistence level of output were likely to be low and very seasonal in nature.¹⁰ This meant that there were a relatively large number of manhours per person available during the off-season for other types of work. But, since the labor requirements necessary to produce for subsistence needs in the traditional sector were low, Africans were unlikely to enter the labor force during the busy agricultural season unless the wages paid them were relatively high. The result was relatively low-wage labor available on a seasonal basis, but with costs to the employer increased due to high turnover rates, and only relatively high-wage labor available year around. In addition, low population densities

meant that costs of transportation and communication necessary to assemble a work force of given size were higher than in a more densely populated region.

From the beginning there were frequent complaints of labor shortages on the part of the colonial administration, timber companies, and European planters. Wages which were established in the port areas, where a limited amount of year-around labor was available relatively cheaply, tended to be extended to other areas, where the practice of working for wages except for short periods was not well established and where a shortage of labor therefore resulted. Given the unstable nature of the labor force and the belief that Africans were target-income seekers at best, European employers were unwilling to attempt to attract labor by raising wages. Instead they put pressure on the administration to provide them with adequate labor at low wages.

One of the chief instruments of the colonial government's cheap labor policy was the head tax. Since it had to be paid in currency, there was an obligation for Africans to obtain some cash income. Where commercial opportunities were not available in agriculture this could only be earned by working for wages. In addition, the government, which obtained a certain amount of involuntary labor for public works projects and military service, frequently recruited at the same time for private employers as well. There is clear evidence that this recruitment was accomplished only with a strong element of compulsion.¹¹

As African cash crop farming increased during the 1920's and 1930's and provided a viable alternative to wage employment, European employers found it increasingly difficult to obtain local labor. As a result recruitment shifted to the north, and especially to the Mossi country of Upper Volta where population densities were high and where conditions were not suitable for commercial farming. The railway in particular was useful in transporting these workers southward to the forest. But the element of compulsion and the poor pay and working conditions offered by Europeans in both Upper Volta and in the Ivory Coast resulted in a massive movement of workers to Ghana where labor was voluntary and wages and conditions much better.¹²

By the late 1930's African cash crop farming was beginning to draw heavily on the available labor supply. Aside from the higher wages or wage equivalent, workers preferred the greater freedom of hours and methods of work. With the coming of World War II the labor shortage became acute. At the same time that demands increased for bearers because of the gasoline shortage and for Africans to gather rubber to support the war effort, the real value of wages decreased due to the scarcity of imported goods. Forced labor recruitment was, as a result, intensified.

Then in 1946 forced labor policies were abandoned by law throughout the French colonial empire. Soon thereafter the demand for workers increased as financing for construction and improvement of roads and the railroad was obtained as part of the first postwar French plan. Employers attempted to

lure labor by paying transportation costs to the place of employment and by raising wages, but, even though consumption goods were again appearing on the market, the local labor force was inadequate and high turnover rates resulted in heavy recruitment costs.¹³

It was natural, then, that European employers should turn toward the potential labor pool of Upper Volta, which African planters had been relying upon for several years after the war. Recruitment from this source was organized under the Syndicat Interprofessionnel pour l'Acheminement de la Main-d'oeuvre, which was supported by coffee, cocoa, and banana growers and the timber companies and which financed the transportation of workers to and from the forest region of the Ivory Coast. During the 1950's information spread rapidly concerning the opportunities available in the Ivory Coast, and, as it did, the spontaneous flow of migrants toward the south soon exceeded those recruited centrally for European employers.¹⁴ By 1965 it was estimated that out of a population of 4,300,000 there were fully 1,000,000 Africans in the Ivory Coast who were either born or had at least one parent born outside the country.

The existence of a large pool of labor with few alternative opportunities to earn cash incomes outside the forest region of the Ivory Coast was an important factor in permitting the rapid expansion of the economy over the past two decades with wages being maintained at a relatively high but constant level. There was a substantial real increase in the legal minimum wage during the early 1950's, as seen in Table 1, but this was brought to a

TABLE 1

Legal Minimum Wage and Cost of Living Index, 1948-70

Year	Legal Minimum Wage (CFAP/hr) ^a			Cost-of- ^d Living Index (1960=100) (4)	Index of Real Value of Nonagriculture Legal Minimum Wage (1960 = 100) Col. (1)/col.(4)	Index of Real Value of Agricultural Legal Minimum Wage (1960 = 100) Col.(3)/Col.(4)
	Nonagric. Zone 1 ^c (1)	Agriculture ^b Zone 1 ^c (2)	Zone 2 ^c (3)		Col. (1)/col.(4)	Col.(3)/Col.(4)
1948	5.83	-	-	33.6	46.7	-
1949	9.37	-	-	47.0	53.7	-
1950	11.00	-	-	51.1	58.1	-
1951	12.50	-	-	55.6	60.5	-
1952	15.70	-	-	64.2	65.9	-
1953	18.15	-	-	65.1	75.1	-
1954	21.00	18.10	15.30	63.7	88.9	123.0
1955	21.83	18.83	16.07	66.1	89.1	124.6
1956	26.47	22.71	19.55	67.7	105.4	147.6
1957	29.87	24.00	19.55	76.6	105.1	130.7
1958	33.83	25.17	18.88	93.8	97.2	103.0
1959	37.00	26.00	19.50	99.5	100.2	100.0
1960	37.00	26.00	19.50	100.0	100.0	100.0
1961	40.00	28.00	21.00	110.9	97.2	96.9
1962	40.00	28.00	21.00	109.3	98.6	98.4
1963	40.40	28.29	21.21	109.3	99.7	99.4
1964	42.40	29.75	22.25	110.7	103.5	102.5
1965	42.40	29.75	22.25	113.8	100.7	100.1
1966	42.40	29.75	22.25	118.5	96.4	95.8
1967	42.40	29.75	22.25	121.2	94.3	93.8
1968	45.23	-	23.38	127.8	95.4	93.3
1969	46.69	-	24.50	133.3	94.5	93.8
1970	58.30	-	28.10	144.8	108.6	99.4

Notes for Table 1:

^aSalaires Minima Interprofessionals Garantis. When changed during the year, a weighted average is given with the weights equal to the proportion of the year in which each wage rate was in effect.

^bHourly equivalent of the legal daily wage where the working day is assumed to be eight hours in length.

^cZone 1 is roughly a semicircle centered on Abidjan with a radius of 75 kilometers; Zone 2 includes all the rest of the forest region.

^dCost-of-living index of a European family in Abidjan for 1948-1960 linked with the cost-of-living index of an African family in Abidjan for 1960-1970.

Sources: Ivory Coast, Service de la Statistique, Inventaire Economique et Social de la Côte d'Ivoire, 1947-1958, Abidjan: 1960; Ivory Coast, Direction de la Statistique, Bulletin Mensuel de Statistique, Abidjan: various issues; Ivory Coast, Direction de la Statistique, Situation Economique de la Côte d'Ivoire, Abidjan: various years.

halt in 1956 was a result of a decline in coffee and cocoa prices and the relative importance politically of the African planter class. From this date until 1970 there does not appear to have been any increase in real wages in urban areas, and rural wages may actually have declined in real terms, though the price index used here is not very appropriate. It also may be argued that the legal minimum wage is not a good indicator of actual wages paid, especially in the non-modern sector, but independent evidence indicates actual wages correspond quite closely and may, if anything, be higher than the legal minimum.

It appears, then, that by the mid-1950's information concerning opportunities in the southern part of the Ivory Coast had spread rather effectively to the northern part of that country as well as to Mali and Upper Volta. The result was a massive migration in search of land or wage employment. Since economic conditions in these northern areas did not change, it may be presumed that the subjective opportunity cost of leaving home to go to the rural areas of the south was roughly the same for the 550,000 or so migrants out a population of perhaps 8 to 10 million in the labor surplus areas.

At first many of these immigrants were able to obtain land relatively easily, either as sharecroppers or without payment of any kind. As the good land was taken up, its value rose and immigrants were forced to settle in less accessible areas. Although the purchase of land was possible by the early 1960's, few migrants had the necessary capital or were able

to obtain credit on reasonable terms. At the same time reduced prices for coffee and cocoa put pressure on African smallholders to make their operations more efficient. One result of all this seems to have been a shift from shareholding to the employment of wage laborers on a seasonal basis. A large part of the immigrant labor force was thus left essentially floating and was apt to return to the regions of origin if employment or land was not available.

It seems then that the labor market situation in the rural forest area of the Ivory Coast from 1956 to 1969 may be reasonably characterized by a perfectly elastic supply function established at the opportunity cost of labor in the countries supplying workers to the Ivory Coast. The quantity of labor supplied was determined, on the other hand, solely by demand factors. Unemployment, to the extent that it existed, was primarily an urban phenomena and concerned the aspiring white collar class more than unskilled labor. Underemployment, in the sense that the marginal product of labor differed markedly between sectors, would not appear to have been important in the forest area except seasonally due to the high costs of shifting labor between sectors for short periods.

The evolution of the labor situation had important implications for timber, coffee, and cocoa production. Logging, for example, was, in the pre-World War I period, an activity engaged in by both European and African entrepreneurs. Timber camps were all located very close to waterways or to

the railway, and all cutting and hauling of timber to these transportation avenues was by hand. Crews were relatively small, there were no important economies of scale, and capital requirements were minimum. As the most accessible areas were exploited, however, problems of moving timber from the felling areas to waterways or the railroad became more severe. The Europeans solved this problem by laying down track and transporting logs on small flat cars. The greater capital requirements of this method tended to force out African producers, and by the 1920's the industry was almost solely in European hands. The shortage of labor and rising costs due to ever increasing transportation requirements resulted in continued pressure for the use of more capital intensive techniques. By the time the industry was poised for its great expansion after World War II, it was almost completely mechanized.

The evolution of coffee and cocoa farming was very different. From the beginning European and African methods of production differed substantially. While European plantations used relatively labor intensive techniques, African farmers used land extensive methods, which, though yields per unit of land were low, nevertheless resulted in a relatively high return to labor. Fundamentally, the African farmer was making greatest use of the most abundant factor of production while his European counterpart made relatively less use of land and more of labor, a scarcer factor. The European could have used more extensive methods but this would have required his operating over a very wide area in order to earn a return at least as great as his opportunity cost in France. To have done

this would have made supervision of his workers very difficult, and good supervisory personnel was the scarcest factor of production. The African planter, on the other hand, who was content with a much lower total return, operated on a much smaller scale, and could easily supervise his workers personally. Furthermore, he had access to family labor, available during certain seasons at low opportunity cost.

The nature of the technology was such, furthermore, that it could be easily adopted by African farmers without special technical skills or capital equipment. It is in this important respect that coffee and cocoa farming differed substantially from timber production in which very capital intensive techniques could be used to lower costs. In another way, too, the European was at a disadvantage vis-a-vis the African. In case of crop failure, the European plantation, with its dependence on purchased inputs, was much more vulnerable than the African farmer, who could easily fall back on his subsistence production.

The crisis came after World War II. During the war the European planters had been subsidized by the government and provided with forced labor. After the war these policies were abandoned. Planters were forced to raise wages and some attempted to intensify their use of capital in the form of tractors and other equipment. The final blow came, however, in 1949-1950 when most of the coffee in the Ivory Coast was destroyed by disease. Although European planters had much greater access to credit than did the Africans, few tried to re-establish their plantations, and coffee and cocoa production became almost exclusively an African enterprise.

By the time of independence in 1960 the basic characteristics of timber, coffee, and cocoa production were well established. The highly mechanized timber industry, almost wholly in European hands, was financed privately from abroad or out of retained earnings. It was heavily dependent, however, on public investment in basic transportation facilities. Coffee and cocoa production, on the other hand, was produced primarily on small African farms using very land extensive techniques. Financial capital was relatively unimportant for these enterprises since most continued to grow the bulk of their food needs and since little modern equipment was required. The capital created on these farms was obtained instead at the expense of leisure or non-agricultural activities. Initially, coffee and cocoa farmers were very dependent on government investment in transportation and agricultural research, but, by the 1960's, the constraints on this production came increasingly to depend on market conditions abroad and less on supply factors.

B. Demand Conditions

The market for Ivory Coast exports has had a varied history. Early trade was characterized by the relative unimportance of France both as a customer and as a source of imports. This was in part due to the poor competitive position of French products in West African markets¹⁵ and in part because the Ivory Coast by international treaty generally received no tariff preferences from nor granted any to France.¹⁶ Trade relations with France were gradually strengthened as a result of licensing during

World War I and as the commercial sector became more oligopolistic in nature and vertical integration was extended after the war, but the first real pressure for closer ties with France came with the depression. Tariffs paid by countries exterior to the Franc Zone¹⁷ were increased, quotas were extended, and, for certain products, subsidies were paid to compensate for lower prices and to stimulate production. In 1936 the international treaty exempting the Ivory Coast from preferential duties was abrogated. Finally, at the beginning of the second world war exchange controls were imposed and exports outside the Franc Zone were prohibited. Except for several years during the war when French West Africa joined with the allies, the effect of the continuation of exchange and price controls in the Franc Zone as well as in other monetary blocs after the war was to cause a greater proportion of trade to be contained within the Zone than had been the case prior to the war. After October, 1947, for example, exports from the Ivory Coast to France were not subject to control, but exports outside the Zone were subject to licensing and the surrender of foreign exchange on unfavorable terms.

After the devaluation of 1949 export controls were eased, and exports of the Ivory Coast to countries other than France began to increase. The next decade or so was characterized by a tariff preference system favoring French exports within the Franc Zone and by benefits for some colonial exports entering France. Export duties on Ivoirian coffee and cocoa were raised from 6 percent, established in the prewar period, to 15 percent in 1950. They were non-discriminatory in nature. Taxes on the export of timber, also non-discriminatory, remained at 6 percent and were even reduced

to 2 percent during the early 1950's when world prices were depressed for several years. Imports into both the Ivory Coast and into France paid a fiscal duty which was non-discriminatory, while imports from non-Franc Zone areas paid a customs duty as well. In addition, Ivoirian coffee was effectively protected in the French market by a 20 percent tariff preference vis-a-vis non-Franc Zone countries.

During the mid-1950's stabilization funds backed by the Fonds National de Régularisation des Cours des Produits d'Outre-Mer were formed in the overseas territories. In the Ivory Coast these grew out of separate coffee and cocoa funds established after the war to stabilize prices at controlled levels. These earlier funds were supplied with part of the export tax assessed on each crop and were used to stimulate production by providing subsidies for planting, research, road construction, agricultural credit, and the use of fertilizers and purchase of equipment. In 1950 the objective of stabilization was eliminated, but as prices dropped after 1954, this question arose again. In 1955 the Caisse de Stabilization des Prix du Café was created, followed the next year by the establishment of a similar fund for cocoa. The main purpose of these funds was to stabilize the fluctuation of prices received by producers, but a secondary goal was to improve marketing techniques. The Caisse de Stabilisation des Prix du Café, for example, was active in promoting Ivoirian coffee on the New York market and also required coffee to be stocked so as to take advantage of the most favorable prices. In addition to any net receipts

of stabilization operations, these funds also received a rebate from the export tax of 22.38 CFA francs per kilogram of coffee and cocoa.

In 1959 the drop in the price of robusta coffee, especially for the New York market, resulted in the coffee fund using up its reserves and borrowing from the Fonds National. Prices paid to producers of both coffee and cocoa were reduced, and, in order to pool the reserves of both funds, they were combined in 1962 and later reorganized in 1964 to include the stabilization of cotton prices within a single Caisse de Stabilisation et de Soutien des Prix des Productions Agricoles. Although the promotion of coffee and cocoa production was not an explicit aim of these stabilization funds at the time of falling prices in the late 1950's and early 1960's, in 1966 the Caisse was explicitly changed with financing measures designed to improve productivity and quality in cash crop production and to favor local processing or transformation. Part of this financing was direct but most was to be accomplished by allocations to the general investment budget of the government.

With the formation of the European Economic Community by the Treaty of Rome of 1957 the commercial policy linking the Ivory Coast to its European markets was substantially modified.¹⁸ In general the tariff preferences favoring trade within the Franc Zone were to be dismantled and replaced with external tariffs common to the EEC and its associate members. This would have the effect of granting members ^{of} the French territories in Africa lower preferences but over a larger market. In addition the various price support schemes for African exports were to be eliminated, and, in compensation,

substantial amounts of aid to these countries were to be channeled through the newly created European Development Fund. All this was to be accomplished over a twelve year time-table, but the Convention of Yaoundé, ratified in 1964, accelerated the process, reducing the ultimate level of common tariff preferences and increasing the total amount of aid. To understand the changing trade patterns of the 1960s and 1970s, however, it is necessary to examine each of the three main exports in greater detail.

Timber. Although up until the twentieth century tropical hardwoods were not well known and were used primarily for aesthetic purposes, in the last seventy years they have increasingly been demanded for a variety of uses to replace dwindling supplies of domestic hardwoods in Europe. Even though, in the early years as seen in Table 2, France was a relatively unimportant customer for Ivoirian timber,¹⁹ the colonial government after World War I did undertake to publicize information concerning the various species and their potential uses. As a result of this publicity and of expanding demand for tropical woods in general, exports increased markedly until 1928, contributing to government revenues obtained from an export tax of 16 francs per ton.

Tropical wood exported from her colonies generally had no tariff protection in France until the depression. At that time tariffs were raised on timber imports in most industrial countries, but France continued to admit colonial exports duty free. As a result, France, which in 1913 had imported only 25% of Ivoirian timber exports, by 1933 accounted for almost 70%. During World War II timber exports were severely handicapped by the

TABLE 2

Quantity of Timber Exported by Destination, Selected Years
(000s metric tons)

Year	France	Other Franc Zone	U.S.A.	U.K.	Germany	Italy	Benelux	Other	Total
1896	1	-	-	7	-	-	-	-	8
1913	10	-	-	36	6	-	-	-	52
1933	29	-	6	4	3	-	1	-	43
1938	35	-	9	5	10	-	4	3	66
1946	21	2	2	11	-	-	5	10	41
1950	30	2	4	21	21	-	19	9	106
1955	72	2	21	1	33	3	17	15	169
1960	321	10	30	16	94	62	63	59	596
1965	518	37	19	111	232	227	218	204	1,566
1969	600	44	28	136	384	760	315	428	2,695

Source: See Appendix Table.

lack of available ships and it was not until several years after the war that the production and commercial organization was again functioning smoothly. To assist timber companies to expand production in the postwar period the colonial government reduced export taxes, lowered import tariffs on equipment, granted a subsidy for the use of the railroad, guaranteed loans from commercial banks, and engaged in various other supporting policies in addition to the provision of an improved transportation infrastructure.

The market for Ivoirian timber exports, which during the depression was concentrated in France, became much more diversified with the easing of controls after World War II, especially in the countries of Western Europe. Even the French market expanded as supplies of domestic hardwoods were used up. No tariff preferences were granted the overseas territories on the French market, and, in any event, they would not have been effective since virtually all the French demand for tropical hardwoods was satisfied by the overseas territories. A common external tariff of 5 percent was established for rough timbers by the Rome Treaty but was reduced to zero before being actually placed in effect. Previous tariffs on tropical timber were low in any case, the highest being that of Italy, 7 percent. In 1964 the United Kingdom also eliminated its preferential duty in return for reciprocal treatment for Commonwealth countries. Thus by the mid-1960s no preferences existed within the major markets for Ivoirian tropical timber.

Despite the relatively low tariffs previously in effect, the growth of timber exports to these markets during the 1960s was rapid indeed. The

explanation seems to lie less in the effect of tariff reduction than in the result of strong increases in demand. Aside from the increases in demand due to rising income during this period, the demand for new sources of supply of hardwoods increased as existing resources in temperate zone countries dwindled. In addition greater information concerning different species was available as a result of promotional efforts. This is important because there are a wide variety of species, the Ivory Coast exporting about thirty, and the market thus tends to be fragmented. For this reason and because it is difficult to obtain standardization of quality, expansion of trade depends very much on the establishment of close relations between individuals importers and exporters. In the Ivory Coast today, in fact, most timber cutting companies belong to large integrated foreign companies.

In spite of rising transportation costs, profitability of timber production in the Ivory Coast has been maintained since prices have increased at least as rapidly. The major problem for future production has to do instead, with supply limitations. The world market today is such that it is profitable to export only the most highly valued species, and several of these are in short supply in the Ivory Coast. As these are exhausted throughout the world, consumers will shift to somewhat less highly valued species, of which the Ivory Coast has abundant supplies, but this may take quite some time given the abundant reserves of Okoumé in Gabon. As a result, although the long-term prospects for timber exports from the Ivory Coast are quite favorable, over the shorter term the rate of expansion experienced over the past two decades will have to decrease.

One possibility for future expansion would involve exporting timber processed in one form or another, but that will be treated in more detail later.

Cocoa. Exports of cocoa were unimportant until about 1910 when they began to expand rapidly. During the following decade French consumption grew by over 50 percent, as world prices for cocoa continued their relative decline, and then stabilized during the 1920s. The Ivory Coast in 1911 was granted a tariff preference of one-half the French import duty of 104 Francs per 100 kilograms. At that time this was equivalent to a preference of about 20 percent of the C.I.F. value of cocoa imports. During the post-World War I period, however, inflation reduced the ad valorem equivalent of this preference despite an upward revision accompanying devaluation in 1926. Nevertheless, this tariff preference enabled the Ivory Coast to capture 45 percent of the French market by 1929.

By that time, however, virtually all of French imports were being supplied by French colonies. Since French consumption remained relatively stagnant during the 1930s, the Ivory Coast had to search elsewhere to market its still expanding cocoa crops, as can be seen in Table 3. This occurred just as world prices fell to about 30 percent of their previous high in 1927 and was an important reason for the shift at that time from cocoa to coffee planting. Within the Franc Zone, however, Ivoirian cocoa exports enjoyed a price which was substantially above that of the world market²⁰ but continued to have to pay one-half the French import duty until 1936. During World War II prices received by Ivoirian producers usually lagged behind cost increases and only subsidies to European producers kept them

TABLE 3
Quantity of Cocoa Exported by Destination, Selected Years
(000s metric tons)

Year	France	Other		U.S.A.	U.K.	Germany	Italy	Benelux	Others	Total
		Franc	Zone							
1920	1	-	-	-	-	-	-	-	-	1
1925	6	-	-	-	-	-	-	-	-	6
1930	18	-	4	-	-	-	-	-	-	22
1934	17	-	9	-	12	-	2	2	2	42
1939	28	-	20	3	-	-	-	4	-	55
1946	12	-	12	4	-	-	-	-	-	28
1950	33	-	4	6	5	2	11	1	-	62
1955	19	1	20	-	7	4	22	2	-	75
1960	26	1	13	-	3	2	11	7	-	63
1965	29	1	32	-	15	9	30	10	-	126
1970	26	1	23	-	22	21	47	3	-	143

Source: See Appendix Table.

in business. After the war exports to France were stimulated by increased demand, in part resulting from prices which were kept artificially low. At the same time unfavorable exchange rates inhibited exports to other countries until the last of several post war devaluations and the relaxation of price and exchange controls in 1949.

This occurred just as world cocoa prices were rising rapidly from 21.5 cents per pound on the New York market in 1949 to 57.8 cents in 1954. The reasons for this rise illustrate well the predominant characteristic of the international cocoa market: instability of prices due to the effect of fluctuations in weather conditions on the supply of this highly perishable crop and to the long lag between planting and production. As a result of the decline in prices over the first two decades of the century, primarily as a result of the growth of African production, and their continued stagnation until after World War II, little new planting had taken place since the 1920's. By the early 1950's, then, most existing cocoa trees were well advanced in age and many had ceased producing altogether. At the same time incomes were rising rapidly with postwar reconstruction, increasing the demand for cocoa. The result was a rapid rise in prices until 1955 when newly planted trees started coming into production and prices broke. Thereafter, there were a series of oscillations due to variations in supply as a result of varying weather conditions as modified by speculative forces.

On the whole, however, prices in the period 1960-1967 were considerably below those between 1949 and 1955. Furthermore, most of the

world's most suitable areas for cocoa had already been planted so that increases in production had to come primarily from increases in yields rather than from new planting, and costs were consequently higher at the same time that prices were lower. The Ivory Coast, however, was one of the few countries which still had good land available for planting during the 1950's and even on into the 1960's. It has thus been well-poised to take advantage of the higher prices experienced in recent years.

The oscillations in cocoa prices on world markets due primarily to short-term variations in supply which are difficult to control has been the subject of considerable concern. A Cocoa Producers' Alliance has been established among countries producing about 75 percent of the world's cocoa in order to keep excesses of production from forcing prices down in years of favorable harvests, but it has not generally been successful. The primary problem today for the Ivory Coast thus remains short-term price instability rather than the long-term depression of prices or the expansion of markets at least as rapidly as the ^{annual} projected rate of growth of world consumption of about 2.5 percent over the next ten years. The main instrument for dealing with this short-term instability as far as the producer is concerned is the stabilization fund. Since 1966-67 it has tended to accumulate funds from its cocoa operations but at prices to producers lower than those paid during its first years, especially in real terms.

Although, legally, Ivoirian cocoa benefitted from a 25 percent preferential tariff on the French market, in practice this meant nothing since exports by the overseas territories far exceeded French cocoa imports, and French prices

corresponded closely to prices elsewhere, as can be seen from Table 4. A common external tariff was established at 5.4 percent in 1964 by the EEC, thus providing some limited protection, and, as expected, there has been a substantial increase of Ivoirian exports to Common Market countries other than France. Since almost half of that market is supplied by countries which must pay the 5.4 percent tariff, there may be room for a substantial enlargement of the Ivory Coast share at the expense primarily of other African producers. The preference is slight, however, and the gain correspondingly small since all cocoa may be marketed without difficulty at prevailing world prices.

Coffee. In contrast to timber and cocoa, whose principal markets have largely been outside of France, exports of coffee from the Ivory Coast have received important French benefits in the form of direct subsidies and a protected market. Ivoirian coffee exports to France benefitted in the early years from a rebate of 78 francs on the import tariff of 136 francs per 100 kilograms. Although some coffee was exported as early as 1892, most coffee was grown for local consumption for many years, the profits from exports not being sufficiently great to match alternative activities. But with the dramatic decline in cocoa prices in the 1930's, coffee production increased rapidly, almost all of it going to France and Algeria, as seen in Table 5. The tariff preference favoring colonial coffee imports was raised in 1933 to 340.4 francs per 100 kilograms. This was approximately 60 percent of the spot price for Brazilian coffee on the New York market. In 1931 a

TABLE 4
Cocoa Prices at Various Points, 1948-1969
(CFAF/Kg)^a

Year	Producer Price Set by Stabilization Fund	FOB Unit Value	Le Havre Spot	New York Spot	France Wholesale
1948	-	37	n.a.	108	44
1949	-	74	n.a.	67	78
1950	-	76	123	123	105
1951	-	111	135	137	169
1952	-	123	136	136	176
1953	-	110	128	143	168
1954	-	168	216	222	270
1955	-	147	139	144	169
1956	70	111	104	104	109
1957	75	95	127	118	135
1958	90	138	213	189	223
1959	95	168	185	198	213
1960	70	139	145	153	173
1961	70	111	114	122	136
1962	70	104	115	113	132
1963	70	113	138	136	160
1966	70	117	128	126	145
1965	55	86	90	117	104
1966	70	108	n.a.	117	144
1967	70	132	155	158	171
1968	70	160	189	187	207
1969	80	222	n.a.	261	284

Notes: ^a Prices converted to CFA francs at official exchange rates.

^b Prices established for principal trading season commencing in the year indicated, applied "nu-basculé" at Abidjan until December 1963 and thereafter at all purchase points throughout the country.

Table 4 continued:

Sources: Food and Agricultural Organization of the United Nations, Cacao: A Review of Current Trends in Production, Price, and Consumption, Commodity Series Bulletin No. 27, Rome: 1955; Food and Agricultural Organization of the United Nations, Commodity Review, Rome: various years; France, Institut National de la Statistique et des Etudes Economiques: Le Cacao et ses Dérivés dans les Pays de la Zone Franc, Documents et Statistiques No. 36, Paris: 1965; France, Institut National de la Statistique et des Etudes Economiques, Annuaire Statistique de la France, Paris: various years; Ivory Coast, Direction des Etudes de Développement, Comptes de la Nation, Abidjan: various years; International Monetary Fund Surveys of African Economies, Vol. 3, Washington, D.C.: 1970.

TABLE 5
Quantity of Coffee Exported by Destination, Selected Years

Year	(000s metric tons)									
	France	French Speaking North Africa	Other Franc Zone	U.S.A.	Germany	Italy	Benelux	Japan	Others	Total
1931	1	-	-	-	-	-	-	-	-	1
1935	5	-	-	-	-	-	-	-	-	5
1939	17	1	-	-	-	-	-	-	-	18
1946	32	5	-	-	-	-	-	-	-	37
1950	44	8	-	2	-	-	-	-	-	54
1955	53	21	-	10	-	67	-	-	1	85
1960	68	20	-	38	1	8	1	-	5	147
1965	75	13	2	48	3	14	-	3	28	186
1970	79	2	2	76	11	4	-	13	8	195

Source: See Appendix Table.

system of subsidies to colonial coffee producers was established and financed from a surcharge on coffee imports into France. Since most of these imports came from non-colonial areas, the subsidy was essentially paid for by the French consumer. The subsidy, which was 2 francs per kilogram in 1931,²¹ had fallen to .3 francs by 1935. The aim and effect of these measures was to stimulate colonial production and enable France to begin to shift her imports away from her traditional dependence on Latin America.²²

With the institution of exchange controls in 1939 severe limitations were placed on coffee imports from outside the Franc Zone at the same time that various forms of subsidy to producers in the Ivory Coast were again increased. Exports of coffee even expanded during the war, though the major market shifted from France to the Allies for several years. After the war with a continued shortage of foreign exchange Ivory Coast coffee found a ready market in France. In 1950 the Franc Zone supplied 73 percent of French imports, and the Ivory Coast accounted for about 40% of these colonial exports.

Just prior to World War II about 40% of the coffee produced in the Ivory Coast was robusta, the rest being primarily Gros Indiéné. By the mid 1950s, however, after tracheomycosis had eliminated virtually all but the robusta inae variety, which was resistant to this disease, Ivory Coast production was almost solely concentrated on robusta coffee. Robusta coffee had been grown for some time in Uganda and Angola and thus already formed part of the world coffee market. Its price was not determined independently, however, but rather was established in relation to that of

Brazilian arabica coffee, which dominates the world market and is considered to be of better quality than robusta for ground coffee. The high prices of Brazils in the early 1950's resulting from the exhaustion of world coffee stocks in 1949 together with Brazilian efforts to hold up the price during the second half of that decade resulted in a strong incentive to substitute robustas for more expensive coffee. One result was the expansion of the production of soluble coffee in which robusta has some distinct advantages and, as seen in Table 6, a narrowing of the price differential between Brazils and robusta. The most important growth of soluble coffee occurred in the United States, and it was to this market that the Ivory Coast turned increasingly from 1954.

But the expansion of demand for robusta coffee was not limited to the soluble coffee market. In France especially, as a result of the forced shift from Latin American sources of supply owing to protective tariffs, quotas, and exchange controls, consumers began to develop a taste for Robusta. Although the percentage of robusta used in coffee blends in that country prior to the war had been very low, by 1957 fully 71 percent of blended coffee was made from robusta. The proportion has increased since then, yet soluble coffee represented only 12.5 percent of total French coffee consumption in 1968. Since most exchange controls had long since been removed, tariff preferences were relatively low, no quotas were in effect, and the relative price differential between robusta and Latin America coffees on the world market was no higher than before the war, it seems reasonable to conclude that by 1968 French tastes had been markedly altered in favor of robusta coffee. In addition to France, Italy, the Netherlands, and Belgium also

TABLE 6

Prices of Brazilian and Robusta Coffee at Various Points, 1948-1969
(CFAF/kg)^a

Year	Producer ^b	FOB Unit Value	LeHavre	New York	New	New	France
	Price Set by Stabilization Fund		Ivory Coast Spot	Ivory Coast Spot	York Uganda Spot	York Santos Spot	Ivory Coast Wholesale
1948	-	45	n.a.	-	48	73	55
1949	-	67	n.a.	-	59	102	87
1950	-	123	n.a.	-	154	194	160
1951	-	153	n.a.	-	180	209	240
1952	-	166	185	-	169	208	243
1953	-	177	199	-	183	223	261
1954	-	192	209	-	223	303	271
1955	-	141	149	-	148	220	214
1956	-	127	144	-	129	224	220
1957	-	138	166	-	133	219	242
1958	115	167	188	-	160	206	266
1959	105	153	171	147	156	201	245
1960	95	127	172	105	110	199	244
1961	80	131	165	101	100	196	235
1962	80	133	168	107	112	184	236
1963	90	134	153	153	151	185	221
1964	90	155	194	194	193	253	262
1965	75	139	170	155	166	243	235
1966	90	167	191	185	184	240	244
1967	90	171	189	184	184	205	253
1968	90	167	190	186	186	203	205
1969	95	169	203	192	191	233	236

Notes: See Table 4

Table 6 continued:

Sources: Food and Agricultural Organization of the United Nations, The World Coffee Economy, Commodity Bulletin Series No. 33, Rome: 1961; Food and Agricultural Organization of the United Nations, Commodity Review, Rome: various years; France, Institut National de la Statistique et des Etudes Economiques, Le Café dans les Pays de la Zone Franc, Documents et Statistiques No. 36, Paris: 1966; Pan American Coffee Bureau, Annual Coffee Statistics, New York: various years; Ivory Coast, Direction de la Statistique, Situation Economique de la Côte d'Ivoire, 1969, Abidjan: n.d.; Ivory Coast, Direction des Etudes de Développement, Comptes de la Nation, Abidjan: various years; International Monetary Fund, Survey of African Economies, Vol. 3, Washington, D.C.: 1970.

consume substantial quantities of robusta in other than soluble coffee form.

After World War II coffee imports from the overseas territories benefited from quotas and a preferential tariff of 20 percent levied by France and 10 percent levied by Algeria on imports from third countries. This tariff applied to virtually all arabica coffee since little of this variety is grown within the Franc Zone. The effect of the tariff and quotas was to establish a price for a limited quantity of arabica in France which was higher than that on the world market. The rest of the demand for coffee in France was satisfied by robustas from within the Zone at a price which might be higher but could not fall lower than the world price for robusta. Until 1954 the combined French and Algerian market was large enough to absorb all Franc Zone robusta coffee at prices above those on the world market, but in that year production increased substantially and lower relative prices on the French market caused Ivory Coast exporters to sell 15 percent of the crop in New York. In order to preserve the higher French price during the next few years a system of licensing known as "jumelage" was used. This system, one form of which had previously been employed for cocoa during the 1930's, required exporters to ship a certain proportion of their coffee to outside markets. World prices continued to fall, however, and the French government agreed in 1959 to maintain a support price for coffee in France and Algeria by fixing quotas on imports from Franc Zone countries.²³ The effect for several years was to maintain this price about 60 to 65% higher than the world price. Returns to exporters to different markets were equalized by the Ivorian stabilization fund.

Associate membership in the European Economic Community has had a number of implications for Ivory Coast coffee. The French price support scheme had to be dismantled and quotas on foreign exports had to be eliminated. In return Ivory Coast exports were admitted to the EEC at a 9.6 percent tariff preference beginning in 1964. Since the demand of this market for robusta coffee is currently less than the total supply of the Associate Members, a means must be found, as in the past, for discriminating between this and other markets in order to make the tariff effective. This could occur through effective cooperation on the part of the various stabilization funds which are responsible for marketing. At least until 1970, however, it did not appear that the external tariff was fully effective in raising the EEC price of coffee above world market levels. Of greater importance than the tariff preference, though, has been the amount of aid channeled through the European Development Fund during the past decade.

Between 1958 and 1962 there were a series of international coffee accords culminating in the International Coffee Agreement of 1962. According to this agreement the Organisation Africaine et Malgache du Café (OAMCAF) was assigned a quota of coffee which could be exported to participating consumer countries over each of the next five years. OAMCAF in turn assigned the Ivory Coast 5 percent of this total market. The quota was increased to 5.6 percent for the period 1968-73. The result of this agreement has been to help stabilize prices, but it has also created problems of surplus disposal for the Ivory Coast. One alternative was to sell surplus

coffee outside the countries signing the agreement, but at a substantially lower price. Another was to try to limit new planting. In fact, production expanded during the early 1960's and the Ivory Coast was fortunate in being able to market part of its crop beyond its quota, but within the area of the Agreement, because of harvest failure in some countries which were unable to fill their quotas. In 1965, however, the government had to limit new plantings and to attempt to stabilize production. Surpluses continued to accumulate and during 1967-69, 140,000 tons of coffee were destroyed. It is anticipated that about 212,000 tons may be marketed within the agreement in 1972-73 and that the Ivorian quota will be extended at the rate of about 2.2 percent annually from that date. Further increases in exports must find new markets, in Japan or Eastern Europe perhaps.

II. The Postwar Record

During the past 25 years great changes have taken place in the Ivory Coast economy, many of which have been the result of the rapid growth of production and export of timber, cocoa, and coffee. As seen in Table 7, it is timber which has grown most rapidly during these years, followed by cocoa and then by coffee. A quantity index of exports, of which timber, cocoa, and coffee comprised about 80 percent of the total value over the entire period, increased at an average annual rate of 8.5 percent. During the same period, if we neglect the immediate postwar shortage years, the terms of trade, while varying, did not indicate any clear long term trend. Thus the purchasing power of exports has been maintained.

Table 7

Timber, Cocoa, and Coffee Exports, Quantity Index of Exports,
and the Terms of Trade, Selected Years
(Quantities in 000s Metric Tons)

Year	Timber		Cocoa		Coffee		Quantity Index (1953=100)	Terms of Trade (1953=100)
	Quantity	%Value	Quantity	% Value	Quantity	% Value		
1947	49	4.9	28	19.0	43	55.8	61	28.8
1950	106	4.2	62	34.1	54	48.4	100	86.5
1954	182	3.6	53	32.3	88	62.0	110	136.7
1959	444	11.9	63	43.2	105	47.3	149	105.3
1962	915	19.4	101	22.1	143	39.6	250	81.0
1964	1,526	23.9	124	19.5	204	42.5	339	85.8
1965	1,566	26.9	126	15.9	186	37.8	345	76.2
1967	1,840	27.1	105	17.2	149	31.6	343	89.9
1969	2,695	29.7	119	22.2	178	25.5	435	102.9

Sources: Appendix Table and data from the author's forthcoming book on the economy of the Ivory Coast.

This postwar experience of growth reflects the supply and demand characteristics just discussed. Timber exports, constrained primarily by an insufficient transportation infrastructure prior to World War II, have expanded rapidly as this deficiency has been remedied since the war. Cocoa production, after having been slowed by the low prices of the depression and wartime difficulties of marketing, responded rapidly to rising prices during the first ten years of the postwar period but later leveled off after a lag of several years following the drop in prices in 1955. The production of coffee, which had grown more rapidly than cocoa during the depression and war, also increased swiftly in the early postwar years but began to decline in relative importance by the mid-1960s.

The export growth record only gives part of the picture, however, since it does not include that part of production which is sold to processing firms to be later exported or used domestically. Historically, domestic sales of timber have been much more important as a percentage of total production, as seen in Table 8, than have domestic sales of either cocoa or coffee. In recent years, however, domestic sales of cocoa have increased considerably as a rising proportion of that product has been processed prior to export. These forward linkages and their effects will be examined in more detail below.

The impressive record of export growth achieved by the Ivory Coast during the postwar period has been accompanied by an equally impressive overall economic performance. Although data with which to examine this experience for the 1950's are very limited, there do exist reasonably good estimates of

Table 8
Production and Domestic Sales of Timber, Cocoa
and Coffee, 1954-1967

Year	Timber				Cocoa			Coffee		
	Production		Domestic Sales		Production		Domestic Sales	Production		Domestic Sales
	Quantity (000s m ³)	Value (Million CFAF)	Quantity (000s m ³)	Value (Million CFAF)	Quantity ^a (000s tons)	Value (Million CFAF)	Value Millions CFAF	Quantity ^a (000s tons)	Value (Millions CFAF)	Value (Millions CFAF)
1954	292	n.a.	123	n.a.	75	n.a.	-	n.a.	n.a.	n.a.
1955	358	n.a.	149	n.a.	71	n.a.	-	92	n.a.	n.a.
1956	442	n.a.	167	n.a.	73	n.a.	-	114	n.a.	n.a.
1957	407	n.a.	172	n.a.	45	n.a.	-	108	n.a.	n.a.
1958	657	n.a.	190	n.a.	56	n.a.	-	104	n.a.	n.a.
1959	767	n.a.	209	n.a.	62	n.a.	-	153	n.a.	n.a.
1960	1,060	6,504	220	468	85	10,948	-	137	18,221	17
1961	1,260	8,454	260	571	91	8,875	-	172	21,972	23
1962	1,450	9,179	295	744	83	9,190	-	117	16,350	82
1963	1,810	12,293	330	874	99	11,221	-	215	27,805	117
1964	2,270	17,140	410	1,158	133	14,724	40	241	37,111	133
1965	2,605	16,709	700	1,721	115	9,283	772	213	27,439	130
1966	2,600	16,734	778	1,900	163	14,158	1,072	256	31,888	145
1967	3,022	19,963	850	2,125	129	14,859	2,023	157	24,732	190

Notes:

^aPrior to 1960 data apply to the trading season for which most of production is marketed in the year indicated. From 1960 data are on a calendar year basis. Excess of production over Domestic Sales will differ from exports, given elsewhere, because of changes in stocks and differences in the time of recording.

Sources: Ivory Coast, Service de la Statistique, Inventaire Economique et Social de la Côte d'Ivoire, 1947-1958, Abidjan: 1960; Ivory Coast, Direction de la Statistique, Situation Economique de la Côte d'Ivoire, Abidjan: various years; Ivory Coast, Direction des Etudes de Developpement, Comptes de la Nation, Abidjan: various years

the national accounts for the 1960s.²⁴ From 1960 to 1967 Gross Domestic Product in the Ivory Coast rose at an average annual rate in real terms of about 7 percent. On a per capita basis this amounted to close to a 4 percent annual rate of growth. At the same time a fundamental restructuring of the economy was taking place with the proportion of primary production in GDP decreasing from 49 percent to 38 percent while that of the output of the secondary sector increased from 27 percent to 42 percent. Most of this expansion of industry was concentrated in the production of energy, construction, and manufacturing of previously imported goods, the last sector being assisted by substantial private capital inflows. Nevertheless, a large part of the growth of real investment at an annual rate of 10.5 percent was financed by domestic savings, the savings ratio averaging between 15 and 16 percent of GDP during most of the period. In the foreign trade sector real exports increased at almost an 8 percent annual rate of growth, maintaining a large and continuously favorable balance of trade, which was used to finance much of the growth in repatriated profits and remittances sent abroad by workers.

During this period the Ivorian government favored an increase in the diversification of agriculture and a program of industrialization concentrated on import substituting industries, and, to a lesser extent, on export processing. The first objective was to be reached by expanding agricultural research and a variety of programs designed to reach the farmer. Among the more important crops with which some degree of diversification had been achieved by the late 1960s were palm products, bananas, pineapples, rice, and cotton. In the manufacturing sector the major means

of attracting foreign capital was the formulation of a rather liberal investment incentive scheme as well as the absence of restrictions on the repatriation of profits. These policies, together with the expanding Ivoirian market, resulted in a very rapid growth of this sector during the 1960s.

III. The Direct Contribution to National Income and Employment

In evaluating the direct contribution of timber, cocoa, and coffee production to the national income of the Ivory Coast, an assessment must be made of the opportunity cost of each factor of production, for, ideally, this contribution should be measured net of these opportunity costs. Where the industry is relatively small, the concept seems clear, the opportunity cost of an input being equal to the cost of using that input in its next most profitable employment. But where the industry is very large in relation to the rest of the economy, some ambiguities arise. To understand this it is useful to look separately at timber and at coffee and cocoa.

Although timber in the late 1960s accounted for about one-quarter of the total value of exports, its impact on factor markets was slight. Skilled labor and private capital, for example, could be imported from Europe or from other African countries at fixed prices and helped to earn quickly the foreign exchange needed to pay for them.²⁵ Unskilled labor was also available at a relatively constant wage from either within the Ivory Coast or from the countries to the north. Since the timber industry in the mid-1960s probably employed less than 10,000 out of a total of over 500,000 workers immigrating from the north, the effect of that industry on the wage level is likely to have been minimal.

The major constraint on the expansion of timber production during this period, as we have said, was the availability of public transportation infrastructure. Construction of these facilities, in turn, was constrained ultimately by the provision of French public capital and by the rate at which the government was able to plan and execute transportation projects. The effect of this investment was to lower transportation costs to the port and thus raise the economic rental value of land not previously served by public roads. The government, in turn, siphoned off much of this rent with an array of taxes imposed on timber companies, though some of the rent probably went to companies able to gain more favorable geographical positions without paying higher taxes.²⁶ In the strictest sense of the word, of course, the timber reserves opened up to exploitation did have an opportunity cost, that is the return which could have been received by waiting and cutting the timber at a later date when prices might have been higher and the technology more efficient. The choice depended on the use to which acquired rents were put, a matter which will be considered below.

It is somewhat more difficult to evaluate conceptually the opportunity cost of factors used in productive activities that dominate the entire economy. Such is the case with cocoa and coffee, which, though competing with each other for land, labor and capital in some areas, if taken together employ factors whose alternative uses would not appear to be nearly as profitable. Even some of the intermediate inputs, such as transportation services, would earn a much lower return in the absence of cocoa and coffee. This presupposes, however, that agricultural research would not have discovered some other equally profitable crop, an assumption

which does not seem justifiable given the long history of research in the Ivory Coast.

It seems preferable, instead, to consider the opportunity cost of factor inputs at the margin of their use today. Since a very large amount of employed labor originates from outside the country and since rural surveys indicate that agricultural wages during the busy season are above the legal minimum wage, it is reasonable to suppose that the rural wage rate is determined by market forces and that the opportunity cost of labor at the margin is equal to that wage. Family members working fields near their homes may be willing to work for less, but since it pays to expand production further by employing labor from outside at higher wages, these family workers implicitly earn rents to their more advantageous position adjacent to areas of production. On the other hand, there is evidence that younger people from the cocoa and coffee producing areas, . . . are more likely than their northern counterparts to go to school for a few years and then migrate to the cities in search of white-collar jobs. They, in effect, consider their opportunity cost to be higher than the wages paid in agriculture. On balance, the most reasonable alternative is to evaluate the social opportunity cost of labor at the wage rate of rural workers and to assume, for reasons stated earlier, that the supply of labor is perfectly elastic at that wage.

The opportunity cost of purchased inputs is also approximately equal to the price paid for those inputs. Private capital used in cocoa and coffee production, unlike that employed in the cutting of timber, is not imported from abroad but is made from labor used to clear land and to plant and care for trees until they enter production. The opportunity

cost of this capital is the cost of the labor used in its creation. Unlike imported foreign capital, however, the supply of local capital in rural areas is not perfectly elastic. A large part of this capital is saved out of agricultural income and is likely to be a positive function of its rate of return at the extensive margin of production where economic rents to land are zero. When financial capital is not available for hiring workers to extend cocoa and coffee production, it can be created out of family labor reallocated from leisure or other productive activities. Because of this and the fact that agricultural incomes were growing rapidly, the supply of capital was probably quite elastic during this period.

Lack of agricultural knowledge, which in the past had been a severe constraint on production, did not act to limit the expansion of cocoa and coffee during the 1950s and 1960s. The particular varieties planted during these decades had, by this time, established their supremacy--in cocoa very early, in coffee only with the outbreak of tracheomycosis in 1949. The major constraint seems to have been a combination of public investment in transportation, especially feeder roads, and the vagaries of the international market as influenced by government policies. As in the case of timber, the combination of infrastructure and policies, given world prices, the available technology, and the returns to capital and labor, determined the rent to land and the division of that rent between the government and the farmer. Again, the opportunity cost of land should be considered in relation to the possibility of postponing this period of rapid growth of what Myint has called the "vent-for-surplus" variety,²⁷ but the net gains from postponement appear to be much less important than in the case of timber.²⁸

It is possible to estimate quantitatively the returns to the various factors, as well as payments for inputs of goods and services, used in the production of timber, coffee and cocoa. These estimates were made on the basis of data published in the national accounts and of the results of extensive surveys of the timber industry and of the main cocoa and coffee producing regions conducted during the period 1962-1966. Details of the estimation procedures are contained in the notes to the tables which follow, but several comments are appropriate here. First, because of wide variations in the value of production of cocoa and coffee due to weather and fluctuating prices, estimates have been calculated for each of the years 1960 through 1967 even though this required making a number of somewhat arbitrary assumptions. It was presumed, for instance, that the inputs of materials, services, labor and capital varied in direct proportion either to the area planted or to the quantity produced. This assumption seems reasonable given the relative constancy of the prices of these inputs and the fact that no substantial increases in either yields or labor productivity appear to have taken place over the period. For timber it was assumed that the size of the capital stock varied in proportion to the number of cubic meters produced. Secondly, in order to treat the timber and the cocoa and coffee sectors on a comparable basis, commercial margins and taxes paid by traders after the purchase of cocoa and coffee from producers were added to intermediate inputs of services and to value added respectively. Finally, all labor input was valued at 200 francs per day, an approximate average of rates obtained from rural surveys for the busy agricultural season.²⁹ Given an acknowledged margin of error in the estimation of this wage of perhaps 10 percent, the

slow rate of inflation, and the uncertainty regarding trends in real or nominal rural wages during the period, the wage rate was assumed to remain constant over the entire eight years.

Estimates for the value of intermediate inputs and value added divided into labor costs, payments to government, and a residual are given in Tables 9 and 10. One of the first things to note is that the value of intermediate inputs used in the production of timber is nearly twice that employed in cocoa and coffee. If transportation services were excluded from the latter sector, the contrast would be much greater. The low value of these inputs in cocoa and coffee production reflects the relatively simple technology and low yields characteristic of these activities.

Although the absolute value of the returns to labor in cocoa and coffee production is three to four times that in the production of timber, the relative share of labor in value added, averaging 38 percent for timber, do not much differ. There is, however, substantial year to year variation in this share. Payments to government, on the other hand, differ substantially between these activities, both absolutely and as a share of value added. Rising from 19 percent of value added in 1960, payments by the timber industry averaged 31 percent from 1962 to 1967. The combination of export taxes on cocoa and coffee and operations of the stabilization fund resulted in wide variation in payments to government from this source because of fluctuations in weather, international prices, tax rates, and prices paid to the producer, but the average share of value added was 22 percent, substantially less

Table 9 continued:

Note:

^aIncludes estimates for the payment of direct taxes as well as indirect taxes taken from the national accounts.

Source: Ivory Coast, Direction des Etudes de Développement, Comptes de la Nation,

Abidjan: various years; Ivory Coast, Ministère de l'Agriculture, Economie Forestière de la Côte d'Ivoire, Paris: Société d'Etudes pour le Développement Economique et Social, 1967.

Notes:

^aEstimates of the value of material and service inputs were obtained for each year by multiplying the ratio of this value to either tons of cocoa and coffee produced or hectares in production, as estimated by regional surveys for 1962-1964, times the quantities produced or area in production each year. To this was added the cost of transportation and commercial transactions after deduction for taxes paid and the net balance of stabilization operation.

^b200 francs per day multiplied by the estimated number of man-days used in production assuming 17 days for cocoa and 28 days for coffee required per hectare for tree maintenance and 50 days for cocoa and 150 days for coffee required per ton for harvest operations. These requirements are based on information gathered in a survey of the southeast area of the country conducted in 1963-1964.

^cIncludes export tax estimates and the net flow of stabilization operations.

Sources: Ivory Coast, Direction des Etudes de Développement, Comptes de la Nation, Abidjan: various years; Ivory Coast, Ministère du Plan, Région du Sud-Est: Etude socio-économique, Paris: Société d'Etudes pour le Développement Economique et Social, 1967; Ivory Coast, Ministère du Plan, Région de Daloa-Gagnoa: Etude socio-économique, Paris: Bossard Uniter, 1967; Ivory Coast, Ministère du Plan, Etude Générale de la Région de Man, Paris: Bureau pour le Développement de la Production Agricole, n.d.; Ivory Coast, Ministère du Plan, Etude Régionale de Bouaké, 1962-1964, Abidjan: 1966; annual data on the number of hectares of cocoa and coffee in production obtained from the planning ministry of the Ivory Coast.

than that of timber.

The remaining portion of value added is broken down in Table 11 into an allowance for amortization, the net return to capital, and a residual rent. The return to capital for cocoa and coffee was calculated rather arbitrarily at 8 percent, but the results are not much affected by a change of a few percentage points in either direction. This is slightly lower than the average rate of return to capital in timber production, which averaged just under 9.5 percent for the eight years.

Of greatest interest, perhaps, are the substantial rents to land devoted to cocoa and coffee production after deduction for the returns to all other factor services. In the Southeast, where practically all rural families grow at least some cocoa or coffee, the average return to labor per hectare in 1964 was 14,300 francs per year. The average annual return to cocoa land for the entire nation, which is somewhat lower than that for the Southeast region, was 11,500 francs. If we consider only family labor valued at 8,100 francs per hectare in the Southeast in 1964, the return to land in cocoa actually exceeded that of labor. Returns to land planted in coffee were lower, and this is consistent with the general impression, confirmed by land use estimates, that farmers were tending to switch to cocoa during this period.³⁰ It must be remembered, moreover, that the rents to land shown in Table 11 do not include payments to government but only that portion retained by the farmer. It seems clear, then, that by the mid 1960's good cocoa and coffee land was of considerable value to its owners.

Table 11

Capital and the Distribution of Factor Returns in the Production
of Timber, Cocoa, and Coffee, 1960-1967
(millions CFAF)

	1960	1961	1962	1963	1964	1965	1966	1967
Timber								
Capital ^a	5,668	6,737	7,753	9,678	12,138	13,929	13,902	16,159
Amortization ^a	850	1,010	1,163	1,452	1,820	2,089	2,085	2,424
Net Profit ^b	220	320	987	1,312	2,525	- 417	146	1,557
Rate of Return to Capital ^c	3.9	4.7	12.7	13.6	20.8	-	10.5	9.6
Cocoa and Coffee								
Agricultural Income ^d	20,061	21,144	13,773	22,098	29,574	24,592	28,586	21,736
Cocoa	7,535	6,472	5,268	6,506	9,070	6,909	10,461	8,851
Coffee	12,526	14,672	8,505	15,592	20,504	17,683	18,125	12,885
Labor Costs ^e	8,882	9,921	8,342	11,556	12,857	12,150	13,983	10,726
Cocoa	1,787	1,933	1,931	2,145	2,317	2,363	2,870	2,549
Coffee	7,095	7,988	6,411	9,411	10,540	9,787	11,113	8,177
Capital ^f	27,127	27,093	28,336	29,338	31,571	32,388	32,840	33,287
Cocoa	9,900	10,800	11,624	12,240	12,528	12,852	13,140	13,320
Coffee	17,227	16,293	16,712	17,098	19,043	19,536	19,700	19,967
Amortization ^g	1,643	1,590	1,695	1,751	1,895	1,944	1,970	1,997
Cocoa	495	504	581	612	626	642	657	666
Coffee	1,148	1,086	1,114	1,139	1,269	1,302	1,313	1,331
Return to Capital at 8%	2,170	2,167	2,267	2,347	2,525	2,591	2,627	2,663
Cocoa	792	864	930	979	1,002	1,028	1,051	1,066
Coffee	1,378	1,303	1,337	1,368	1,523	1,563	1,576	1,597
Residual Rent ^h	7,366	7,466	1,469	6,444	12,297	7,907	9,946	6,350
Cocoa	4,461	3,171	1,826	2,770	5,125	2,876	5,883	4,570
Coffee	2,905	4,295	- 357	3,674	7,172	5,031	4,063	1,780
Residual Rent per Hectare (CFAF)								
Cocoa	16,221	10,570	5,655	8,147	14,727	8,056	16,118	12,351
Coffee	5,429	8,488	- 688	6,919	12,127	8,292	6,641	2,870

Notes:

^aBased on benchmark estimates obtained from a survey conducted in 1960 and on the assumption of a constant ratio of capital to the volume of timber produced in subsequent years.

^bObtained as a residual after deducting estimates for amortization, direct taxes, and payments for financial services.

^cEqual to net profit divided by the capital stock.

^dEqual to production valued in terms of prices paid to the farmer minus the value of intermediate inputs purchased by the farmer.

^eSee Table 10.

^fEstimated from the imputed value at 200 francs per day of labor used in clearing, planting, and maintaining cocoa and coffee trees until they enter production, assuming that only one half of actual clearing costs are attributable to cocoa and coffee, the remaining half going to food production which frequently is combined with the planting of cash crops the first year. Labor requirements were estimated as 180 days per hectare for cocoa and 161 days per hectare for coffee from the Southeast rural survey cited in Table 10.

^gStraight-line depreciation over 20 years for cocoa and 15 years for coffee.

^hObtained by deducting labor costs, amortization, and the return to capital from agricultural income.

Sources: See Tables 9 and 10.

The development of these exports was not only of interest to African planters, it was also a net gain to the whole economy. If it is assumed, in accordance with our previous discussion, that the social opportunity cost of all factors except land was equal to the prevailing factor price, this net gain was equal to the sum of Payments to Government and the Residual Rent received by cocoa and coffee farmers. The ratio of the net gain from timber production to the total value of this production climbed from .107 in 1960 to .171 in 1962 and remained roughly constant thereafter. For cocoa and coffee, however, this net gain coefficient was much higher, averaging .383 during the entire period with no clearly discernible trend.

An alternative way of considering the net gain is to examine its importance relative to the total amount of accumulated public investment in the Ivory Coast. Since much of this investment had as its effect to open up new areas to the export trade, the returns to government and to land may be alternatively viewed as a return on this public capital. At the beginning of 1960 it has been estimated that the value of this capital in terms of the prices of that year was 83.7 billion CFA francs. Assuming that the 1960-1966 investment program was equally spread out over the next seven years, the value of the capital stock may be estimated for each year. The total net gain to the economy from timber, cocoa and coffee production during this time averaged about 13 percent of the value of this accumulated investment. If only that part of investment which contributed directly to export expansion is included in the capital stock, that percentage is much higher--perhaps 30 to 40 percent. Thus it is clear that the economic gains which directly resulted from this investment were very important.

The employment and income resulting from these export activities, shown in Tables 12 and 13, differ markedly. Total employment in the timber industry in 1963 has been estimated as 16,636 persons of which approximately 45% were Ivoirians. In the cocoa and coffee producing regions, on the other hand, there were about one million persons working in agriculture, spending on the average approximately 40 percent of their time devoted to agriculture in the production of these cash crops. Of these almost 90 percent were Ivoirians.

Other important facts are revealed by looking at incomes. First, in terms of absolute size coffee and cocoa generated substantially larger incomes than did timber, though being a relatively capital and skill intensive activity and employing fewer workers timber production paid each of them on the average substantially more than did cocoa and coffee farming. The largest share of income, moreover, went to the European owners and managers of these firms. Even total salaries received by Europeans were more than two-thirds as great as the wage bill paid to Ivoirians and equaled 27 percent of total labor costs. Non-Ivoirian Africans, though employed proportionately more in the lower skill grades than Ivoirians, nevertheless received almost as much in total wages because of their greater numbers. In cocoa and coffee production, on the other hand, in addition to a larger total income, Ivoirians received by far the largest share of income from their labor, capital investment, and ownership of land. Non-Ivoirian Workers, in fact, received only slightly more than one-quarter of the total wage bill and 13 percent of total income. Because of lower skill levels and the seasonality of employment, however, each worker on the average received substantially less than did workers in the timber industry.

Table 12

Distribution of Employment and Income from Timber Production
by Origin of Recipient, 1963

	Ivoirian	Non-Ivoirian African	Non- African	Total
Employment ^a	7,541	8,604	491	16,636
Yearly Income (millions CFAF)	848	792	1,925	3,565
Wages and Salaries ^b	848	792	613	2,253
Net Profit ^c	-	-	1,312	1,312
Average Wage (CFAF/year) ^d	112,451	92,050	1,248,472	135,420
Share of Income (%)	24	22	54	100
Wages and Salaries	24	22	17	63
Net Profit	-	-	37	37

Notes:

^aEstimated by averaging data shown in Table 16 for 1961 and 1966 and adjusted for under-coverage as reported in the timber industry survey cited in Table 9.

^bEstimated on the basis of average wage rates by skill group, given in the timber industry survey, and adjusted to the total wages and salaries shown in the national accounts for 1963.

^cSee Table 11. Since the vast majority of timber companies are owned by Europeans, it was assumed that all of net profits went to this group.

^dObtained by dividing estimated wages and salaries by the number of employees of each category.

Sources: See Table 9.

TABLE 13

Agricultural Employment, Proportion of Agricultural Time in and Distribution of Income from Coffee and Cocoa Production by Region, 1962-1964^a

	Region				Total
	Southeast	Daloa-Gagnoa	Man	Bouake	
Employment (000s persons)					
Heads of Farm	99	84	72	71	326
Family Workers	163	143	110	181	597
Local Hired Workers	2	1	0	0	3
Non-local Hired Workers	90	54	6	12	162
Ivoirian	22	21	1	2	46
Non-Ivoirian	68	33	5	10	116
Total	354	282	188	264	1,088
Proportion of Agricultural Time in Coffee and Cocoa (% days)					
Heads of Farm and Family Workers	50	46	19	12	32
Hired Workers	84	81	80	74	82
Yearly Income (million CFAF)					
Heads of Farms and Family Workers	13,394	6,436	1,888	1,339	23,057
Return to Labor ^b	10,735	5,307	1,752	1,062	18,856
Rents, Return to Capital, etc.	3,462	1,821	877	617	6,777
Hired Workers ^c	7,273	3,486	875	445	12,079
Ivoirians	2,659	1,129	136	277	4,201
Non-Ivoirians	694	439	22	46	1,201
	1,965	690	114	231	3,000
Average Income per Recipient (CFAF/year)					
Heads of Farm and Family Workers	41,000	23,400	9,600	4,200	20,429
Return to Labor	13,200	8,000	4,800	2,400	7,342
Rents, Return to Capital, etc.	27,800	15,400	4,800	1,800	13,087
Hired Workers	28,902	20,500	22,700	23,100	25,510
Rents, Return to Capital, etc. per Hectare (CFAF/ha)	16,945	18,444	13,177	5,933	15,901
Share of Income (%)	100.0	100.0	100.0	100.0	100.0
Heads of Farm and Family Workers	80.1	82.4	92.7	79.3	81.7
Returns to Labor	25.8	28.2	46.4	46.0	29.3
Rents, Return to Capital, etc.	54.3	54.2	46.3	53.3	52.4
Hired Workers	19.9	17.6	7.3	20.7	18.3
Ivoirians	5.1	6.9	1.3	3.5	5.3
Non-Ivoirians	14.8	10.7	6.0	17.2	13.0

Notes for Table 13:

^aData for the Man and Bouaké regions were obtained in 1962-1963; all other data apply to the season 1963-1964. Output in each region was valued in 1963-1964 producer prices.

^bObtained by estimating the total return to labor, using the method described in the notes to Table 10, and subtracting the return to hired workers estimated on the basis of the observed number of days worked in cocoa and coffee. This is a slight over estimation of labor time spent by hired workers in current production since it is impossible to separate out the number of days devoted to the maintenance of trees not yet in production. Clearing and planting time, however, is not included.

^cThe distribution of the wage bill paid to Ivoirian and non-Ivoirian hired workers is based on the relative numbers employed in each region.

Sources:

Ivory Coast, Ministère du Plan, Côte d'Ivoire 1965: Population; Etudes Régionales 1962-1965-Synthèse, Abidjan: 1967; regional surveys cited in Table 10.

The regional variation in cocoa and coffee production is also striking. The Southeast area of the country has had the longest history associated with these cash crops and is the most commercialized. There, 21 percent of the total labor force, including family workers many of whom devote only part of their time to agriculture, are hired from outside. In the Daloa-Gagnoa region, located in the center-west of the country where production has grown most rapidly in recent years, 19.5 percent of the labor force works for wages. Man and Bouaké, in the western and central parts of the country, are more marginal areas of production and are less dependent on hired labor. Also indicative of the greater concentration of cocoa and coffee in the Southeast and Daloa-Gagnoa region is the higher proportion of agricultural time devoted to these crops, especially among heads of farm and family workers, who are not hired primarily for this work.

As expected, average incomes from cocoa and coffee decrease as one moves from the Southeast toward the newer and more marginal regions of production. This is as true of the returns to family labor as it is of the returns to capital and land. The average income of hired workers in Daloa-Gagnoa, however, is lower than in any other region, probably because hired labor is used for clearing and planting, activities which have been more important in this region in recent years than elsewhere but the wages for which are not included in the table. In the Southeast this income is higher than elsewhere since laborers are more likely to work all year or at least for an entire agricultural season.

Also interesting is the value of residual rent and the return to capital per hectare of land in production. In the Southeast, where trees

in some areas are past their prime and declining in yields, returns are somewhat lower than in Daloa-Gagnoa, where cocoa and coffee have been planted more recently. Clearly indicated, too, is the marginal nature of the other two regions, especially of Bouaké, where, after deduction for labor costs, returns per hectare are less than one third those of Daloa-Gagnoa. It is important to note, however, that while Bouaké is a marginal region in terms of land use, especially outside of the southern part, coffee growers are nearly as well developed commercially as the farmers in the Southeast and in Daloa-Gagnoa, as evidenced by the high share in total income from cocoa and coffee of wages going to hired labor.

IV. Linkage Effects

Linkage effects, defined as economic benefits and costs associated with the impact of export expansion on other sectors of the economy, may result from interrelationships in production, consumption, savings, and investment. In a strict sense they should be valued net of opportunity cost, that is the net gain which arises from the exploitation of scale economies, externalities, the use of underemployed resources, or, from the national point of view, the attraction of capital and other scarce resources from abroad. In a broader sense, however, the objectives of economic development may be multiple, and linkage effects should be defined to include progress toward achievement of all goals. Even if there is no gain net of social opportunity cost, for example, linkage effects which increase equality of income distribution may be desirable.

It is also important to define the concept of net gain over a relatively long period of time. One of the arguments associated with the

desirability of industrialization is that long-term prospects are not good for the continued growth of traditional exports at a rate sufficiently rapid to stimulate sizeable increases in per capita income. In the Ivory Coast, for example, we have seen that the prospects for growth of exports of cocoa and coffee at a rate much faster than three percent per annum are poor and that supply constraints affecting timber production are likely to become increasingly important in the next few years. The current profitability of these long-established exports, however, makes it difficult, and not necessarily desirable, to undertake any large-scale reallocation of resources at present. Yet there are a number of reasons why the current beginnings of restructuring the economy in the directions of agricultural diversification and industrialization are important. For one thing, although there appears to be no underemployed rural labor during the busy season, there is a good deal at other times of the year. The difference between the average income of unskilled workers in the timber industry, which employs labor throughout most of the year, and that in cocoa and coffee production is strong evidence of this. Severe difficulties, moreover, lie in the way of gainfully employing agricultural labor during the slack season because of the reduction of efficiency and high turnover costs involved. Only through the development of a diversified range of activities will it be possible to provide year-round employment for the bulk of the population and develop a modern, stable work force. Furthermore, although unemployment among unskilled workers today is largely seasonal,³¹ in future years the spread of communications is likely to result in an increased demand for year-round employment with resulting open unemployment if new jobs of this nature are not created.

Another reason for current efforts toward industrialization is that the Ivory Coast is a small country with a limited market, which, if it is going to have a substantial industrial sector, must find export markets for its manufactures. To be competitive in world markets these goods will have to be produced by a labor force which is sufficiently skilled to satisfy demand for high quality and low cost. The development of those industrial skills in a population which is largely engaged in agriculture is a major task which will require some time.

The growth of industry in recent years has been extremely rapid, stimulated in part by liberal government investment incentives. So too has been the expansion of agricultural products other than cocoa and coffee. Our concern here is to outline some of the ways in which this fast pace of industrialization and diversification, as well as the growth of the tertiary sector, has been encouraged by the expansion of the three main exports.

A. Production Linkages

The timber and cocoa and coffee sectors may generate linkages, either backward or forward, which increase capacity utilization or induce new investment in other sectors. Backward linkages, generated by the demand for intermediate inputs of goods and services, appear to be relatively weak for timber. Although the share of estimated local purchases of these inputs rose from 49 percent in 1960 to 79 percent in 1967, most of this was for the transportation of logs to the port, an activity which is conducted primarily by the timber companies themselves and can be considered as being within the same enclave, though it does provide employment for a number of Africans. Aside from trans-

portation, the most important stimulus to backward linkage production comes from the demand for fuel oil for heavy equipment and trucks, which, since 1966, has been refined locally. Capital expenditures are less likely to affect the local economy since equipment tends to be highly specialized and could not be efficiently produced within the Ivory Coast at this stage. Out of estimated capital expenditures of from 1.9 billion francs in 1960 to 4.8 billion francs in 1967, approximately 85 percent represented purchases from abroad.

Backward linkages in the cocoa and coffee sector are even less important as a percentage of the total value of production, as can be seen from a comparison of Tables 9 and 10, but their impact on the local economy, especially in the transportation and commercial sectors, is probably greater. These sectors tend to be much more diffused, involve a much larger number of Africans, and the returns to both capital and labor are more likely to go to Africans, though not necessarily to Ivoirians, than is the case with timber. Of some importance, too, is the decortication of coffee, much of which is performed by larger planters who have invested in the necessary machinery. Of lesser importance is the stimulus given to the local manufacture of jute bags, pesticides, and insecticides. Investment in the planting of cocoa and coffee trees, because it is such a labor intensive activity, also contributes to African incomes, though the expansion of this investment was not as rapid during the 1960's as it was a decade earlier. Nevertheless, it is clear that the failure of most farmers to use substantial amounts of purchased inputs has limited the backward linkage effects of these two crops.

Forward linkages, on the other hand, are much more important, especially for timber. In 1954, as seen in Table 8, sales of timber to local sawmills and other processing installations accounted for 42 percent of total production whereas processing of cocoa and coffee, aside from preliminary activities carried out in the village such as sorting and drying, was limited to conditioning prior to export. By 1967, the proportion of local to total sales of timber had fallen to 28 percent, but local processing of cocoa and coffee, extended principally to the manufacture of soluble coffee and the intermediate products, cocoa butter and cake, accounted for six percent of the total value of production and was expanding rapidly. It was envisioned that, by 1975, 30,000 tons of coffee would be processed annually, much of it from crops which would otherwise not be exportable, either because of poor quality or because markets could not be found. During the first years of production, as seen in Table 14, all of the cocoa butter and cake and about 80 percent of the soluble coffee was exported.

Despite the relatively large quantity of timber which is processed domestically, the Ivory Coast does not appear to have a strong comparative advantage in exporting processed wood. Historically, the timber supplied to local sawmills has been of inferior quality or damaged in transit so as to be unacceptable for export, but since 1962 the government has required timber companies to process locally part of their production which would otherwise be exported as logs. In 1966 the tax laws were changed so as to provide a further incentive for local processing. The growth of the domestic market has not been as great as that of local production, more-

TABLE 14

Value of Production and of Exports of
Processed Timber, Cocoa, and Coffee, 1960-1967^a
(million CFAF)

	1960	1961	1962	1963	1964	1965	1966	1967
Lumber, Plywood, Veneer								
Production	1,397	1,733	2,185	2,672	3,682	5,740	5,686	5,909
Export	680	810	950	1,030	1,990	3,492	3,357	3,599
Cocoa Butter and Cake								
Production	--	--	--	--	59	1,193	1,657	2,614
Export	--	--	--	--	59	1,153	1,555	2,693
Soluble Coffee								
Production	--	--	188	235	305	450	591	611
Export	--	--	132	190	242	384	472	486
Roasted Coffee								
Production	42	60	100	170	170	110	92	82
Export	22	30	55	90	90	35	40	32

Note: ^a Production and export figures differ from year to year because of variations in inventories as well as domestic sales.

Sources: Ivory Coast, Direction des Etudes de Développement, Les Comptes de la Nation, Abidjan: various years.

ever, so that about 60 percent of locally processed timber has been exported in recent years, as compared to about 40 percent from 1960 to 1964. The study of the timber industry undertaken in the mid-1960s revealed, however, that exporting unprocessed logs was considerably more profitable and contributed more government revenue and foreign exchange than did primary processing. The latter activity, in fact, was undertaken by timber companies primarily in order to satisfy the government's requirement. With the change in tax legislation in 1966, the private profitability of exporting unprocessed logs decreased, but this did nothing to increase the social benefits derived from processing the best timber for export. Nevertheless, there may be a social gain from processing associated with the acquisition of skills and the use of species which are not exportable in raw form but can be used domestically or exported to a limited extent as timber or plywood.³²

The extent to which backward and forward linkages result in gains to the economy net of social opportunity cost is difficult to evaluate quantitatively, but these gains do not appear to be very great. First, as we have seen, the linkages themselves are not strong, especially the backward linkages excluding the transportation sector. Forward linkages seem more important in relation to the value of production, but value added, in the production of cocoa butter and cake especially, is not great and timber processing is achieved at the cost of some loss of efficiency in the allocation of capital. Secondly, where important linkages do exist, there are few economies of scale to be exploited in most of the linked sectors since the optimum scale of each establishment is, in most cases, well short of the demand or supply created by the export sector. There are exceptions,

of course, such as petroleum and the production of jute bags, but they are not numerous. Thirdly, there do not appear to be any important externalities except those associated with the acquisition of skills and the advantages gained by agglomeration. From a distributional point of view, however, one of the important characteristics of the timber processing industry may be its dispersed character, providing some manufacturing employment in rural areas. Finally, these linked sectors use few, if any, otherwise underemployed productive factors. Cocoa and coffee transportation, which because of its flexibility is able to employ people seasonally, experiences its greatest demand for labor at approximately the same time that workers are needed in agriculture. Management, capital, skilled labor, and even unskilled labor are imported from abroad at fixed factor prices in most of the other industries, while the one factor which is still underutilized, land, is not an important input.

B. Final Demand Linkages

In evaluating the linkages associated with the demand for goods and services resulting from the incomes generated in the export sector, we are disadvantaged by the difficulty of obtaining reliable estimates of the distribution of incomes among savings, consumption of imported goods, and consumption of domestically produced goods. Budget studies in rural areas have been conducted, but these data are extremely difficult to estimate accurately. We can use estimates from the national accounts instead, but they apply to the entire country. Because of the pervasiveness of cocoa and coffee cultivation, however, the national accounts estimates may be of some use along with various qualitative observations.

First of all, it is clear that the impact on final demand of incomes generated in cocoa and coffee has been enormous. In 1960 agricultural incomes earned in the production of cocoa and coffee were 23 percent of Disposable Personal Income. Although this proportion had dropped to 18 percent by 1966, a year more typical than 1967, cocoa and coffee incomes still rose by 40 percent during these six years. Even given the leakages out of the income stream due to taxes, savings, transfers abroad, and expenditures on imported goods, the impact of this sector on total consumer demand must have been very important.

In contrast to production linkages for which net gains seemed rather low, moreover, the gains associated with the expansion of demand are substantially greater. In the first place, the total magnitude of the effect is more important because incomes generated in cocoa and coffee production are three or four times the value of intermediate inputs plus value added in processing. Secondly, economies of scale which were relatively unimportant in production-linked local industries such as transportation, are much more extensive in the consumer goods industries currently in the process of import substitution. The sustained industrial expansion of the last decade has, in fact, been possible only because of the simultaneous increase in size of the domestic market. Investments have frequently been made well ahead of the expansion of demand because capacity utilization rates tend to climb rapidly. It is worthwhile noting, too, that for purposes of market expansion it makes little difference whether incomes are paid to Ivoirians or to other Africans, except in so far as the latter transfer part of their earnings out of the country.³³ Thirdly, the externalities associated with the agglomeration of

industry, urbanization, and the creation of a pool of skilled labor are likely to have been important in the past, though they may be giving way currently to problems associated with congestion and too rapid a rate of rural-urban migration. Finally, there is the question of whether any underutilized factors have been brought into production or whether most factors have been imported from abroad or reallocated from other sectors. Much of the expansion of the labor force in industry, for example, has been achieved by non-Ivoirians. Nevertheless, it is probably true that many of these immigrants will continue to live in the Ivory Coast for years, and one should not distinguish too sharply between African nationalities in assessing the benefits of expanded employment opportunities. Furthermore, the expansion of industry has increased the number of white collar jobs, to which many Ivoirians feel they are more suited by virtue of their education, and this has been a net social gain. In addition, unlike most backward and forward linkages, the effects of cocoa and coffee production on final demand have included the small-scale manufacturing and services sector, which presumably is more flexible in providing employment on a seasonal basis.

It should be borne in mind, however, that a large part of industry is subsidized by the investment incentive program, by low interest rates, and by mildly protective tariffs. Although the investment incentives are supposed to be temporary, it is recognized that some firms are never likely to be able to operate without them. Since all these measures represent a cost to the consumer and to other sectors, any net gain is reduced accordingly.

Most of these effects exist for the final demand generated by the timber industry as well, but the impact is much smaller. Salaries earned by Europeans, for example, are more likely to be transferred abroad or to be used to purchase imported goods than is the income earned by African planters. The higher proportion of non-Ivoirians in the timber industry also implies that a greater proportion of African wages will be transferred outside the Ivory Coast. Finally, most of the profits earned by European companies are either transferred abroad or used to purchase imported equipment, whereas the profits of African farmers are more likely to be spent at home.

It seems clear that there are substantial savings by cocoa and coffee planters, but they are difficult to measure because of a certain amount of secrecy and the tendency to hoard savings as cash rather than to place them in banks or postal savings accounts. There are also wide fluctuations with changes in yearly income. Nevertheless, there is substantial evidence that planters, in addition to expanding the area of cultivation, have been able to finance the construction or purchase of schools, home improvements, agricultural implements and small machinery, vehicles, and, in some cases, urban houses. Some of these investments, such as purchases of taxis or rental of houses, have been for business purposes. In recent years savings have also been used to finance diversification into other agricultural products such as oil palm.

There is little information concerning the rate of savings. The regional study of the Southeast in 1964 estimated the savings rate as 15 percent of family income, but failed to include a number of investment

expenditure items as part of savings. The national accounts estimates of all personal savings are about 8 to 10 percent of Disposable Personal Income, but it is recognized that this is a residual item which contains all the errors of other estimates. In any case, it seems clear that, in addition to forced saving from government taxation, there is a substantial amount of voluntary saving as well.

C. Technological Linkages

There have been a number of external economies associated with the production of timber, cocoa, and coffee. One of the most important has been the construction of feeder roads by timber companies and African planters for the evacuation of their products. These roads have later served as transportation routes for a variety of purposes. In sparsely populated areas of the country, immigrating Africans have often established their villages along the roads previously built for the transportation of felled timber. Among the gains resulting from this improved transportation network, aside from the effect of a reduction in the cost of transport, are increased competition among commercial traders at the local level and greater access to agricultural extension services, health facilities, and schools.

In addition to roads, transportation vehicles and commercial networks established primarily for the export trade are available during the off-season for other tasks. Historically, the network supplying imported goods throughout the year frequently coincided with that set up for exports. Although these networks tend to be more distinct today, there is still

substantial overlap, with some equipment and personnel employed in both sectors. At the same time that these two directions of trade have reinforced each other, however, their lines of communication have been such as to inhibit internal exchange.

In the same way that the development of linked industries has helped to build up a pool of skilled labor, so have timber, cocoa, and coffee contributed directly to the acquisition of skills available for other uses. Truck driving, road building, and tree clearing are some of the skills employed in the timber industry which have application elsewhere. The African planter, as he becomes increasingly commercial by planting new land and hiring labor, develops entrepreneurial abilities that can be applied to a variety of enterprises, nonagricultural as well as agricultural.

To some extent the external economies described here influence relative prices and are thus peculiar rather than technological.³⁴ Skills general to several fields may be acquired in the timber industry, for example, through apprenticeship programs in which wages received are lower than those of unskilled workers so that the apprentice, in effect, pays for his own training.³⁵

Given a perfect capital market and no uncertainty, this is a socially efficient situation. In the absence of knowledge concerning the generality of skills, however, employers will pay for at least part of the cost of training, and some underinvestment will occur. In either case adjustment of the distribution of costs and benefits is achieved in the lifetime pattern of wages and depends on the degree of uncertainty concerning the future usefulness of training. In the absence of a capital market, on the other hand, wages which are already low cannot be depressed much further, and employers thus must pay most of the cost of training even if everyone is aware of its future value.

The difference between technological linkages, in which free benefits or costs are transferred between firms or households, and precuniary economies or diseconomies, in which benefits and costs are

valued in the market but are unanticipated at the time of making investment decisions, is primarily a question of the degree of perfection of markets. Pecuniary economies or diseconomies arise because the durability of physical capital and the locational specificity of land imply that decisions made at a point in time under conditions of uncertainty will generally result in unanticipated gains and losses in the future. As long as markets function smoothly, however, these gains and losses can be valued and sold. Thus if a perfect market existed for timber land and if it was unanticipated when a purchaser acquired some of that land that the feeder roads built by timber companies would be useful, he would experience an immediate capital gain as soon as this fact became apparent. After that, however, other land owners would bid against each other, driving down the rents paid by timber companies until they are compensated for the additional capital they create. In the absence of a market, on the other hand, timber companies might continue for some time providing free roads to new settlers, but to a lesser extent than would be socially optimal.

Pecuniary and especially technological economies and diseconomies are likely to be quite important in the Ivory Coast at this stage because of the long durability of infrastructure, because of the importance of locational specificity in a sparsely populated country whose transportation infrastructure is still far from completely developed, because of the uncertainty which is so prevalent, and because markets are often poorly, if at all, organized. The existence of important pecuniary effects may call for government planning and other efforts to reduce uncertainty, but they do^{es} not necessarily require government intervention. Technological

externalities, on the other hand, may be in conflict with various government objectives and cannot usually be corrected without some form of policy action. Thus it is important to try to distinguish between these effects and to estimate the impact of technological externalities on social objectives such as growth and equity. The expansion of timber, coffee, and cocoa in the Ivory Coast has, in balance, favored growth by providing skills and transportation infrastructure especially, but the lack of well developed markets for land and capital indicate that government intervention is needed to gain full advantage from these investments. The distribution of benefits, moreover, has been much wider for cocoa and coffee than for timber, but both sectors have favored the southern over the northern half of the country.

D. Fiscal Linkages

Some of the most important effects of the expansion of timber cocoa, and coffee production have taken place via the fiscal system. All of these exports have contributed in an important way to government revenues, as can be seen in Table 15. The receipts from cocoa and coffee have been especially important in years in which stabilization operations favored the government. Although these funds were received primarily for stabilization purposes during the first part of the period, in recent years an increasing proportion has been allocated for development. Of greater importance as a consistent source of revenue from coffee and cocoa, however, has been the export tax, which provided more than twice the resources contributed by the timber industry until the new tax laws regarding that industry became effective in 1967. Nevertheless, the greatest expansion of revenue has been that derived from timber, the result both of the expansion of production and of a steady increase, since the early 1950's, in the rate of taxation.

TABLE 15

Payments to Government from the Production of Timber and
Cocoa and Coffee, Total Government Revenues,
and Government Surplus on Current Account, 1960-1967
(million CFAF)

	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Payments to Government	3,430	3,671	7,549	12,224	15,550	6,240	9,368	15,169
Timber	699	983	1,573	2,090	3,041	3,038	2,876	3,424
Indirect Taxes	432	650	1,027	1,379	1,920	2,562	2,384	2,476
Direct Taxes ^a	267	333	546	711	1,121	476	492	948
Cocoa and Coffee	2,731	2,688	5,976	10,134	12,509	3,202	6,492	11,745
Export Tax ^b	5,885	6,386	5,451	6,307	7,354	6,985	7,122	6,543
Stabilization Operations	-3,154	-3,698	+ 525	+ 3,827	+ 5,155	-3,783	- 630	+ 5,202
Total Government Revenue	28,000	35,000	39,000	46,000	56,000	57,000	60,000	67,000
Government Surplus on Current Account	5,000	7,000	13,000	16,000	22,000	14,000	17,000	17,000
Payments to Government of Timber, Cocoa and Coffee as a Percentage of Total Government Revenue (%)	12	10	19	27	28	11	16	23

Notes:

^a Estimated as a proportion of total production and of net profits using coefficients calculated for 1963.

^b Estimated by multiplying the equivalent specific tax rate times the quantity of exports.

Sources: See Table 9 and Appendix Table.

In addition to the direct contribution of timber, cocoa, and coffee, averaging 18 percent of total government revenue from 1960 to 1967, their impact on the rest of the economy has strengthened the general tax base. More important at this stage, the foreign exchange earnings of these exports have permitted imports to grow rapidly, and it is import duties which are the most important single source of taxation, averaging nearly half of the total. As a result, total revenues more than doubled during this period and enabled the government to operate with a substantial surplus, used, in turn, to finance capital expenditures. Out of about 93 billion francs in public investment, including that of public corporations, between 1960 and 1966, the Ivoirian public sector was able to finance about 82 percent, the rest coming from foreign aid. Of this total, 18 percent went to general administration, 11 percent to education and health, 12 percent to agricultural development, and 46 percent to economic infrastructure such as transportation and electricity generation. From 1967 to 1970, on the other hand, the Ivoirian government financed only 55 percent of public investment, 8 percent going to administration, 9 percent to education and health, 26 percent to agriculture, and 45 percent to economic infrastructure.

One question which has caused considerable debate is the desirability of an export tax or of a stabilization fund acting as a fiscal agent.³⁶ It is generally held that this tax is easily administered and may increase savings if the government is inclined to save and invest more than producers but that it destroys incentives and does not have the most desirable distribution effects. For the Ivory Coast until the late 1960's, however, the

export tax may have been particularly appropriate and preferable, in some ways, even to a land tax, which though frequently suggested as being ideal from a theoretical point of view is much more difficult to administer. Because of the very elastic supplies of all factors of production except land, the export tax has fallen primarily on land and probably to a much lesser extent on local capital. It differs from a land tax, however, in that it is not the value of land which is assessed but the value of the produce which that land yields.³⁷ Better land pays more taxes per hectare than poorer land, but, since other costs per hectare do not vary proportionately with output, the residual rent net of taxes must be higher on better than on poorer land.³⁸ This was seen empirically earlier in comparing these residuals for different regions of the Ivory Coast.

One effect of the export tax, then, is to keep marginal areas out of production. This is held to be desirable by the Ivoirian government because of uncertain marketing prospects for cocoa and coffee and the durability of capital invested in these trees. Instead, areas which would otherwise be planted to cocoa and coffee can be devoted to other crops, such as cotton, rice, or oil palm. This, in fact, has been the case in the 1960s under the joint influence of lower prices and sustained government taxation. One possible disadvantage, however, is the effect that the tax has on agricultural techniques, since it serves to discourage production on the intensive as well as on the extensive margin. If, as some people believe, agricultural modernization is more likely to be achieved under conditions of intensive cultivation, the tax may have an adverse developmental impact.

From a distributional point of view, the export tax is not as desirable as a land tax, though it may be more attractive than some other forms of taxation. In particular, a properly administered land tax could siphon off all the rent to land, leaving the return to labor and capital, which would be more evenly distributed geographically. On the other hand, an export tax does have the advantage of hitting harder the richer farmers as a group, while farmers cultivating ^{less-}profitable crops pay less taxes. Thus the tax is largely proportional rather than progressive among cocoa and coffee planters, though in the rural areas at least it is progressive relative to taxes on other sources of income. To the extent that savings and capital investment depend on the tax rate, however, it may be desirable to avoid too progressive a tax system.

V. Contributions of Factors Production

Until the end of World War II, growth in the Ivory Coast was constrained by two interrelated factors. First, the difficulty of obtaining foreign capital and the limited domestic resources of the colony severely inhibited the development of transportation infrastructure and prevented the three principal exports from growing at more than a relatively moderate pace. Agricultural research might also have been accelerated if more capital had been available, but, given a moderate level of capital investment, the results of this activity were probably related more to time and to the skills of those involved than to the amount of financial resources available. At any rate, by the mid-1930s most of the research and experimentation had been done which set the stage for later expansion of these exports. Secondly, the constraints on the supply of capital, together with

the existence of an important group of European planters and managers anxious to obtain cheap labor, led the colonial government to institute policies designed to force Africans to work either without compensation or at low wage rates. As a result of attempts at evasion and of the failure to communicate to large number of Africans the advantages potentially to be gained by working in the Ivory Coast, the supply of unskilled labor during the prewar period was inadequate to sustain the magnitude of growth which occurred after the war.

Following World War II both of these constraints were dramatically eased. By the late 1950s the large amount of public investment as well as spreading knowledge of profitable opportunities resulted in supplies of unskilled labor and private foreign capital in the form of direct investment which were, as an approximation, perfectly elastic with respect to price. Foreign exchange either came with the imported capital or was obtained from export earnings. Until the 1960s, furthermore, imports were dominated by consumer goods, and it was only with industrialization that imports of capital goods and intermediate products became important. Although tariffs helped to lessen the demand for imported consumer goods, there were few direct controls on trade, especially after exchange controls were lifted in 1958.³⁹ Repatriation of profits was without restriction except in so far as firms were required from 1962 to contribute modestly to the repayment of the public debt unless they reinvested a certain proportion of their profits within the country. Given the rapid expansion of exports and foreign aid, as well as access of European owned firms to

overseas sources of private capital, therefore, foreign exchange does not appear to have been a constraint on growth during this period.

The chief constraints appear, instead, to have been the rate of inflow of public capital, to a lesser extent the availability of private capital in rural areas, and the absorptive capacity of the Ivory Coast to undertake investment projects. The latter was substantially lessened by the ability to purchase the services of skilled manpower from external sources. Although the cost of this manpower was relatively high, the profitability of investment in this potentially rich country, which had been for so long frustrated by limits on the supply of public capital, was such that skills were readily imported. By the mid-1960's it was estimated that there were approximately 30,000 Europeans living in the Ivory Coast. Despite this, however, the organizational difficulties involved in sustaining a very high rate of investment were such that absorptive capacity must at times have been the chief constraint on growth. Furthermore, the demands for Africanization since independence have applied increasing pressure to avoid this particular solution.

To assess quantitatively the relative importance of these constraints, it is useful to examine some of the variables suggested by Chenery and Strout as being important indicators.⁴⁰ During the period 1946 to 1960 the real value of public investment in the Ivory Coast grew at an average annual rate of 10 percent.⁴¹ We have no figures on private investment during this period, but it is unlikely that it grew more rapidly, except perhaps for the planting of cocoa and coffee trees, which are not

included in the national accounts estimates for the 1960's. During the first eight years of the next decade public investment continued at about the same pace, averaging a 9 percent annual rate of growth, but private investment expanded more rapidly at about 19 percent per year for the first five years, leveled off during 1966 and 1967, and then renewed its previous pace during the rest of the decade. On the average, total gross investment increased annually at about 15 percent during 1960 to 1965 and about 12 percent during the entire first eight years of the 1960's. For a period of over 20 years this is a high rate of sustained investment growth, and occasionally the absorptive capacity constraint must have been effective especially during the first half of the 1960's.

When this constraint was not binding, growth was dependent on the rate of inflow of public foreign capital and on the ability of the country to generate its own public and private savings. Once invested, these helped to create the profitable opportunities which induced the inflow of private foreign capital. In 1947 about 75 percent of public investment capital came from foreign sources. By 1960 this figure had fallen to 28 percent, while for the public investment program of 1967-1970 45 percent of the capital came from foreign sources, but, unlike the 1950's, most of this was in the form of loans rather than grants. The marginal savings rate, defined as the ratio of the increment of Gross Domestic Savings exclusive of net capital inflows to the increment of Gross Domestic Product, was equal to .17 from 1960 to 1967. Since this is slightly less than the ratio of total investment to GDP, the indication is that the Ivory Coast, still substantially dependent on foreign capital inflows to finance a large part of its rapidly expanding investments, is likely to remain so for some time.

Foreign exchange, on the other hand, is not at present a binding constraint. The marginal import ratio of .30 from 1960 to 1967 was about the same as the average ratio of imports to GDP during the entire period. About one half of these imports, moreover, were consumer goods, many of a luxury variety. Since consumer goods have not declined substantially as a proportion of total imports and since the import ratio is high and roughly constant, the foreign exchange required to purchase capital and intermediate goods must have come from the expansion of exports and from inflows of capital. Exports, in fact, increased even more rapidly than GDP at the same time that there were, on balance, substantial capital inflows, all of which financed not only imports but substantial remittances and repatriation of profits. Should capital inflows be reduced, this would have an immediate effect on investment, but foreign exchange shortages could be avoided for a time by policies aimed at reducing the demand for imported consumer goods. Nevertheless, in the long run it is expected that the demand for imports of capital and intermediate goods will increase and that foreign exchange earnings must grow rapidly enough to pay for these as well as for the repatriation of profits and wages and a moderate growth of consumer goods imports. At present, however, the outlook for continued rapid expansion of traditional exports is not promising and whether new agricultural products and manufactured goods can successfully take up the slack remains to be seen. Furthermore, the Ivory Coast is handicapped in one way by its membership in the West African Monetary Union, which prevents its use of a policy instrument which may become increasingly needed: the exchange rate. Consequently, it is important to see what

has been the net effect on foreign exchange earnings, as well as on the supply of skills and capital, of the expansion of timber, cocoa, and coffee in the past.

A. Skills

Because of the high cost of importing human skills from abroad and because of the desire of Ivoirians for an increase in the pace of Africanization, it is important to examine the contribution which the export sector has made to the acquisition of skills. We have already made reference to skills acquired in linked industries and to those earned in the export sector but applicable elsewhere. Here we are concerned only with the magnitude of the skills of Africans associated directly with export production.

Estimates of the number of employees in the timber industry by skill level and by origin is given in Table 16 for 1961 and 1966. Although the number of firms sampled comprised virtually the entire industry in 1961, the sample was not expanded with the growth of the industry and thus it seriously underestimates the number of employees in 1966. Nevertheless, these data probably are not seriously biased as far as the distribution of employment is concerned. Of interest, for example, is the relatively large number of workers who are at least semi-skilled. As a rough measure of the value of those skills, these workers earn on the average perhaps twice as much as unskilled workers. Even the latter earn substantially more per year than do agricultural workers, who during the early 1960's averaged about 25,000 francs per year. Although this partly reflects the greater seasonality of labor in agriculture, it also results from a

Table 16

Number of Employees and Wages in a Sample of Timber Firms by Skill Level
and Origin, 1961 and 1966

	1961			1966			1966 Wages ^a 1963 (CFAF/Year)
	Ivoirian	Non-Ivoirian African	Non-African	Ivoirian	Non-Ivoirian African	Non-African	
Managers	2	3	60	5	3	80	1,500,000-
Supervisors & Technicians	1	3	121	2	0	120	2,200,000
Foreman	53	40	43	29	16	154	300,000-
Clerical	226	73	26	233	186	56	800,000
Skilled	370	104	0	367	285	3	96,000-
Semi-skilled	1,246	282	0	1,104	1,611	0	192,000
Unskilled	3,912	4,078	0	2,116	4,598	0	60,000
Apprentice	359	157	0	100	111	1	72,000

Note: ^a Does not include fringe benefits or bonuses.

Sources: Ivory Coast, Office de la Main d'Oeuvre, Statistiques, Abidjan: various years; Ivory Coast, Ministère de l'Agriculture, Economie Forestière de la Côte d'Ivoire, Paris: Société d'Etudes pour le Développement Economique et Social, 1967.

lower rate of labor turnover in the timber industry and a greater acquisition of skills even on the part of "unskilled" labor.⁴²

The second important feature of Table 16 is the increasing importance of non-Ivoirian Africans, especially in the more skilled positions. Although in 1961 these workers were concentrated predominately in the unskilled category, by 1966 substantial numbers had moved into higher categories, being even more numerous than Ivoirians in semi-skilled work. The number of European foreman also increased markedly, whereas the number of Africans filling this position dropped. This might be the result of the increased demand for talented Africans created by the expansion of industry, but there is no direct evidence.

The composition of the labor force in cocoa and coffee production was previously given in Table 13. Although the numbers involved in this sector are much greater than those working in the timber industry, the average annual returns to labor, and probably the skills as well, are considerably less. Above the unskilled level, the market appears to value much more highly the skills and supervisory talents associated with timber production than it does the entrepreneurial capabilities of the average cocoa and coffee planter, especially when it is acknowledged that much of the residual income accruing to heads of farms from these agricultural activities is a return to capital and to land use. Nevertheless, the acquisition of skills in cocoa and coffee production cannot be ignored because of the large numbers involved and because, in contrast to timber, of the predominance of Ivoirians, as heads of farm and family workers especially.

In addition to those employed at any single time, a large number of Africans have acquired skills in these activities and have later left to pursue other employment. Furthermore, for every three hired workers currently employed in cocoa and coffee production it is estimated that there is one person not currently employed but who is likely to return at some time in the future. The seasonal nature of agriculture, moreover, implies that skills applicable to other activities may be utilized during the off season. If it is assumed that all workers and heads of farm have available 250 working days per year, then, out of a total of 272 million man-days available for work, perhaps 200 million man-days may be devoted to activities other than the production of cocoa and coffee. Although there is no way of measuring the value of the net addition to the supply of skills, the relatively high turnover rates of labor and the relatively short busy season in agriculture imply that the potential is great if these skills have any important usefulness outside of the export sector.

B. Investment Resources

The investment resources generated or imported by the export sector are shown in Table 17. For sake of completeness it was assumed that 15 percent of agricultural income from cocoa and coffee production, after deduction for estimated wages paid to hired workers, was saved, but it is recognized that this proportion is little more than a guess. For the timber industry, the only net savings are those going to government since all profits are assumed to be repatriated abroad. At the same time, however, capital investment, even if it actually took the form of

Table 17

Investment Resources Generated or Imported by Timber,
Cocoa and Coffee Producers, 1960-1967

(Millions CFAF)

	1960	1961	1962	1963	1964	1965	1966	1967
Timber								
Resources Supplied	2,618	3,009	4,661	6,002	6,652	5,100	7,218	8,243
Capital Inflow ^a	1,919	2,026	3,088	3,912	3,611	2,062	4,342	4,819
Payments to Government ^b	699	983	1,573	2,090	3,041	3,038	2,876	3,424
Resources Used								
Gross Investment ^a	1,919	2,026	3,088	3,912	3,611	2,062	4,342	4,819
Net Contribution	699	983	1,573	2,090	3,041	3,038	2,876	3,424
Cocoa and Coffee								
Resources Supplied	5,230	5,290	7,563	12,785	16,207	6,193	9,977	14,390
Gross Savings ^c	2,499	2,602	1,587	2,651	3,698	2,991	3,485	2,645
Payments to Government ^b	2,731	2,688	5,976	10,134	12,509	3,202	6,492	11,745
Resources Used								
Gross Investment ^a	1,609	2,833	2,697	3,984	2,712	2,396	2,417	n.a.
Net Contribution	3,621	2,457	4,866	8,801	13,495	3,797	7,560	n.a.

Notes:

^a Estimated from the difference between the value of the capital stock in successive years plus amortization.

^b See Table 15.

^c Estimated as 15% of total agricultural incomes from cocoa and coffee after deduction for wages paid to hired workers. It was assumed that these represented the same proportion of total labor cost in each year as in 1962-1964.

a reinvestment of earnings, is treated as a capital inflow from abroad which is used entirely by the timber industry. The generation of investment resources in the form of savings by cocoa and coffee planters, on the other hand, does not necessarily equal investment, and, in fact, is frequently greater than that investment, leaving a sizeable quantity of resources available for investment in other sectors.

The importance of the particular form of investment resources generated by the export sector must be emphasized. While the Ivory Coast has had ready access to private foreign capital in the form of direct investment, its supply of public investment resources has not been unlimited, but instead has been the chief constraint on growth over the past twenty years. Nor have African farmers had unlimited access to capital via the banking system or other lending-institutions. The high cost of obtaining information concerning prospective borrowers in rural areas and the resulting uncertainty concerning their prospects for repayment have effectively shut off this source of funds for long-term investment purposes. Thus the generation of savings by the export sector has been of considerable importance in helping to overcome these two bottlenecks to development.

C. Foreign Exchange

The net contribution of foreign exchange resulting from the production and export of timber, cocoa, and coffee is shown in Table 18. This contribution is derived by estimating various items both in terms of local currency and foreign currency. In the first case, the balance of payments impact is measured by subtracting from the sum of payments to government and other local payments the proceeds from local sales, which do not involve foreign

Table 18

Balance of Payments Impact of Timber, Cocoa and Coffee
Production and Export, 1960-1967

(million CFAF)

	1960	1961	1962	1963	1964	1965	1966	1967
A. Local Currency								
Timber								
+ Payments to Government ^a	699	983	1,573	2,090	3,041	3,038	2,876	3,424
+ Other Local Payments ^b	3,519	4,474	4,136	5,681	6,952	9,463	10,276	11,488
- Proceeds from local sales	-468	-571	-744	-874	-1,158	-1,721	-1,900	-2,125
Balance of Payments Impact	3,750	4,886	4,965	6,897	8,835	10,780	11,252	12,787
Coffee and Cocoa								
+ Payments to Government ^a	2,731	2,688	5,976	10,134	12,509	3,202	6,492	11,743
+ Other Local Payments ^b	26,203	27,896	19,331	28,598	39,011	33,227	39,239	27,580
- Proceeds from local Sales	- 17	- 23	- 82	-117	-173	-902	-1,217	-2,213
- Additions to Stocks	-642	-493	+4,450	-3,143	-4,248	-192	-5,080	-348
Balance of Payments Impact	28,275	30,068	29,675	35,472	47,099	35,335	39,434	36,764
B. Foreign Currency								
Timber								
Balance of Trade	2,904	4,194	4,034	5,759	9,584	10,427	9,182	12,024
+ Export Sales	6,036	7,883	8,435	11,419	15,982	14,988	14,834	17,838
- Imports of Materials ^b	-1,491	-1,950	-1,771	-2,330	-3,297	-2,732	-1,930	-1,676
- Imports of Capital Goods ^c	-1,641	-1,739	-2,630	-3,330	-3,101	-1,829	-3,722	-4,138
Balance of Invisibles	-1,073	-1,334	-2,157	-2,774	-4,360	-1,709	-2,272	-4,056
- Imports of Services ^b	-3	-4	-7	-10	-15	-37	-41	-75
- Net Factor Income Paid Abroad ^d	-1,070	-1,330	-2,150	-2,764	-4,345	-1,672	-2,231	-3,981
Balance on Current Account	1,831	2,860	1,877	2,985	5,224	8,718	6,910	7,968
Balance on Capital Account ^e	1,919	2,026	3,088	3,912	3,611	2,062	4,342	4,819
Balance of Payments Impact	3,750	4,886	4,965	6,897	8,835	10,780	11,252	12,787
As a % of Export Sales	62.1	61.9	58.8	60.3	55.2	71.9	75.8	71.6
Coffee and Cocoa								
Balance of Trade	28,275	30,068	29,675	35,472	47,099	35,335	39,434	36,764
+ Export Sales	28,733	30,331	29,956	35,834	47,509	35,628	39,749	37,030
- Imports of Materials ^b	-225	-263	-233	-294	-315	-293	-315	-266
- Imports of Cocoa	-223	-	- 48	- 68	- 95	-	-	-
Balance on Current Account	28,275	30,068	29,675	35,472	47,099	35,335	39,434	36,764
Balance of Payments Impact	28,275	30,068	29,675	35,472	47,099	35,335	39,434	36,764
as a % of Export Sales	98.4	99.1	99.0	98.9	99.1	99.2	99.2	99.2

Table 18 Continued:

Notes:

^aSee Table 15.

^bEstimated from the value of intermediate goods and services in each product class from Tables 9 and 10 and [^] the proportion imported of the total available goods and services in each class. Other Local Payments also includes value added net of payments to government

^cAll equipment was assumed to be imported and all construction was assumed to be domestically produced.

^dNet profit plus amortization from Table 11.

^eGross investment from Table 17.

Sources: Ivory Coast, Direction des Etudes de Developpement, Les Comptes de la Nation, Abidjan: various years.

exchange transactions. These net local payments are the counterpart of the foreign currency earned from exports and capital imports minus the sum of expenditures on imports of intermediate goods and services and capital goods plus net factor income paid abroad. National accounts estimates of the proportion of available goods and services imported in each of 26 product classes were used to estimate the division of total expenditure on intermediate goods and services into imports and local purchases. A more complete analysis would also have included the indirect expenditures on imports of local firms furnishing goods and services to the export sector, but the extent of aggregation and the unstable nature of input-output relations in the Ivory Coast economy at this early stage of industrialization are such that this exercise was not considered to be worthwhile.⁴³ Even the estimates of direct expenditures on imports by the export sector may not be very accurate because of the heterogeneous nature of the various product classes.

The table does, however, indicate the important contribution of foreign exchange made by these exports. Virtually all of the exchange earned from exports sales of cocoa and coffee go to local factors of production. While the balance of payments impact of timber sales has been less important, it has increased much more rapidly than has that of cocoa and coffee. Furthermore, it has also increased as a percentage of export sales, rising from 62 percent in 1960 to 72 percent in 1967. This has been partly due to increased purchases of locally produced materials, such as fuel oil, and partly to the increased rate of government taxation. The

inflow of capital to this industry has also consistently been greater than the outflow of profits, reflecting the high rate of growth of timber production.

In summary, the balance of payments impact of these traditional exports has been the major reason for the lack of a binding foreign exchange constraint during the past 20 years. In order to furnish the foreign exchange necessary to continue its rapid rate of growth the Ivory Coast must find new export products which not only can be expanded rapidly but which also will not require too high a rate of growth of imported inputs. Since many manufactured products today are produced using fairly capital intensive techniques and requiring a high proportion of imported intermediate goods, it may be difficult to generate a rapid growth of net foreign exchange earnings by exporting these products. New agricultural exports, on the other hand, require fewer imports in their production, and, if they can be expanded rapidly, should contribute more to the balance of payments.

IV. Conclusion

The expansion of timber, cocoa, and coffee exports has been viewed here as an example of "vent-for-surplus" growth. The productive factor most abundant in supply with very low opportunity cost in the early years was land, but in order for land to enter into production for export, there had to be developed a knowledge of agricultural possibilities and a transportation infrastructure. Local labor, available from leisure time or other productive activities, was sufficient to initiate cultivation but not to sustain the expansion which ensued during the post-World War II period. For that, a labor market developed, relying upon workers migrating from the north. Private capital and human skills were also imported, especially

from Europe, to ease other potential constraints.

On the demand side the Ivory Coast benefitted, in one way, from its delayed development. Whereas in Ghana much of the best cocoa land had already been planted by the 1930's, in the Ivory Coast at that time this process had just begun. When the depression arrived and cocoa prices plummeted, planters in the Ivory Coast shifted easily to coffee, enjoying the benefit of a protected market in France. During and after the war the expansion of this market was rapid, too, due to the necessity, because of exchange restrictions, for France to rely on colonial coffee. The constraints long imposed on the development of the timber industry, preventing the Ivory Coast from exploiting this resource at a time when world market conditions were not well developed, have also resulted in greater diversification today.

The period of rapid expansion of these traditional exports is, however, nearing an end. Much of the best cocoa and coffee land has already been planted, and the stock of currently marketable timber species is such that some of these will be approaching exhaustion within a decade if their exploitation is not slowed. Cocoa is also subject to highly unstable world prices, and, should an effective international accord be reached to stabilize those prices, the growth of production will be limited to about 2.5 percent per year. Coffee exports, already subject to an international agreement, are limited to an annual growth rate in traditional markets of about 2.2 percent. Though more rapid expansion of the coffee market is expected in Eastern Europe and Japan, the absolute size of these markets

is such that they will not be important to the Ivory Coast for many years.

The contributions which these exports have already made to Ivoirian development have been considerable. The net gain directly obtained in the form of payments to government and the residual rent to cocoa and coffee farmers has been high--13 percent of total accumulated public investment. Cocoa and coffee have accounted for the largest share of this net gain, but timber production has increased its share rapidly from 6.5 to 15.9 percent. Cocoa and coffee have, in addition, not only generated more employment and more income than has timber, but these have gone in much greater proportions to Ivoirians. On the other hand, important regional inequities have also resulted. Whereas per capita income in the southern part of the country averaged 49,000 francs in 1965, three-quarters of it in monetary form, income per head in the north was 18,600 francs, of which only 5,400 francs were received as cash, the rest being imputed sub-sistence production. The ultimate solution to this problem of regional disparity is seen partly as migration towards the richer areas of the south and partly via the introduction of new commercial crops in the north.

Aside from direct contributions, the production of these exports has generated linkage effects throughout the rest of the economy. Although backward and forward linkages in production do not appear to be very important, those resulting from increases in final demand have been enormous, especially for cocoa and coffee. Most of the expansion of the Ivoirian economy has, in fact, depended upon them. Technological linkages have also probably been important, especially the construction of feeder roads and

acquisition of skills, but the value of these is impossible to measure quantitatively. The combination of direct and indirect payments to government resulting from the production of the export sector, furthermore, has enabled the Ivory Coast government to finance a large part of its own investment program, which has been heavily weighted in favor of economic infrastructure but has also increasingly been directed toward agricultural development. In addition, the growth of taxes on exports and imports about the time of independence permitted the government to shift towards a more modern tax structure, yielding relatively low revenue at present but whose base is expanding rapidly with the growth of the economy.⁴⁴

The contribution of the export sector to the total supply of productive factors has also been important. African workers in the timber industry have acquired skills of greater depth, but those learned in the cocoa and coffee sector have been diffused much more broadly, and, to the extent that they are transferable, may be employed during the slack season. Investment resources generated or imported have been slightly more important for cocoa and coffee than for timber, but the latter sector has channeled an average of 31 percent of value added toward the important public investment sector, a percentage which has been growing rapidly, whereas this ~~proportion~~ proportion of value added in the production of cocoa and coffee has oscillated widely around an average of 22 percent with no clearly discernable long-term trend. Cocoa and coffee, however, have contributed to scarce rural savings used for a variety of investments while the profits from timber have generally either been repatriated abroad or reinvested within the industry. Production of cocoa and coffee has also contributed more to

foreign exchange earnings, both absolutely and as a proportion of export sales, though the net contribution of timber has grown more rapidly.

As this phase of rapid growth of these traditional exports is coming to an end, the Ivory Coast government has adopted a program of agricultural diversification and industrialization designed to restructure the economy and expand its export base. Although the growth of exports is expected to slow somewhat, it is not expected to fall below 6.5 percent before 1980. To take up the slack resulting from the slower growth of unprocessed coffee, cocoa and timber, exports of canned pineapple and pineapple juice, canned fish, cocoa butter, soluble coffee, vegetable oils, raw cotton, paper pulp, textiles, and iron ore are expected to increase rapidly. Since these products are based on locally produced raw materials, they require fewer imported inputs and thus avoid one of the difficulties, noted earlier, associated with export of manufactured products.

Most of the domestic raw materials going into these industries will be the result of the agricultural diversification program which is taking advantage of ^{the} Ivory Coast's favorable national endowment and rich heritage of research.⁴⁵ Past experience indicates strongly the importance of this broad base of local research in developing new agricultural products. Where this experience may not be of much help, however, is in showing how new techniques can be spread from experiment station to farmer. In the past, expansion has occurred over empty land using the most extensive techniques. Today much of that land has a relatively high opportunity cost in terms of the cocoa or coffee which may be grown.

Future expansion will have to come increasingly from shifting to more highly valued crops and raising yields. This will require a continuous flow of information between farmers, researchers, and suppliers of agricultural inputs which has not existed in the past. To develop its extension services, the government has for several years been active in a variety of pilot programs designed to introduce new crops or improve techniques. Success has varied, but the real test will not come until these programs are expanded to encompass most Ivoirian farmers, thus placing a greater strain on their administration. Twenty-five years of rapid export growth has contributed the resources required to place the Ivory Coast economy firmly on this more difficult path of sustained development. Whether, in fact, the path will be attained depends now only on the wisdom and skill of the Ivoirian leaders.

FOOTNOTES

¹All the information and data in this essay for which sources are not indicated are taken from this author's forthcoming book on the Ivory Coast economy.

²Annual data on the quantity and value of timber, cocoa, and coffee exports and on the value of total exports for the period 1882-1970 are given in the appendix.

³See Robert E. Baldwin, Economic Development and Export Growth; A Study of Northern Rhodesia, 1920-1960, Berkeley, California: University of California Press, 1966, for a discussion of these characteristics.

⁴The local colonial government continued to pursue this goal until 1915 in the western part of the Ivory Coast, where fierce resistance to colonial rule was encountered, thus diverting substantial resources away from development in the east.

⁵Construction of the railroad passed out of the forest region into the savannah in 1910, having attained a distance of 182 kilometers.

⁶During the inter-war period the expansion of transportation facilities was severely constrained by lack of public capital. In France the demand for capital for reconstruction following World War I and, later, the collapse of the capital market, due to inflation followed by the depression, effectively shut off that source. The French West African government was thus dependent on its own resources, which were very meagre because of the lack of an adequate tax base. This situation was dramatically reversed in the 1950's as the French began to pour large amounts of financial aid into their empire.

⁷The following table gives some idea of the evolution of the road network in the Ivory Coast since 1947. In addition, the condition of many roads was markedly improved.

Total Length of Roads in the Ivory Coast
(kilometers)

Year	Paved	Unpaved	
		All-Weather	Seasonal
1947	50	3,616	7,227
1956	350	8,370	8,020
1967	1165	14,378	20,803

Source: Ivory Coast Territory, Service de la Statistique, Inventaire Economique de la Côte-d'Ivoire (1947 à 1956), Abidjan: 1958; Ivory Coast Republic, Ministère du Plan, Première Esquisse du Plan Quinquennal de Développement 1971-1975, Abidjan: 1968.

⁸This contrasts with cocoa experimentation in Ghana from the first half of the nineteenth century. That Ghanaian cocoa planting expanded rapidly from the early 1890's while no such similar expansion took place in the Ivory Coast until the 1920's suggests that the length of time required for local testing and experimentation before a crop is profitably grown may be measured in terms of decades. As will be seen, this hypothesis is strengthened by the experience with coffee in the Ivory Coast.

⁹Six French agricultural research institutes, each specializing in a different type of crop, and the relatively extensive research facilities of the Ministry of Agriculture form the backbone of this infrastructure.

¹⁰Ester Boserup, The Conditions of Agricultural Growth; the Economics of Agrarian Change under Population Pressure, Chicago: 1965.

¹¹Buell, for example, notes that in the mid-1920's about "thirty per cent of the fifteen or twenty-thousand laborers employed in the forest industry in the Ivory Coast desert after being recruited." (Buell, The Native Problem, Vol. II, p. 31). It is interesting to note, in contrast, that African planters paying higher wages similar to those paid by cocoa farmers in Ghana seemed to have no difficulty in obtaining labor.

¹²During the 1930's it was estimated that about 80,000 workers migrated annually to Ghana from Upper Volta. Estimates of the numbers recruited for work in the Ivory Coast vary, but the number probably did not exceed 10,000 per year during the same period.

¹³The Chamber of Agriculture around 1950 estimated that 190,000 laborers were required in the Ivory Coast, of which 28,000 were needed by European plantations at harvest time.

¹⁴Between 1952 and 1959 this organization financed the recruitment of 150,000 workers. During the same period at least 500,000 non-Ivoirians migrated at least once to the Ivory Coast.

¹⁵It was frequently said that French manufactures tended to be unsuitable for a mass, low-income market in contrast, for example, to British textiles.

¹⁶Two exceptions, to be discussed shortly, were coffee and cocoa.

¹⁷Throughout this essay the term Franc Zone will be used to denote France and all of her overseas departments, territories, colonies, and ex-colonies which are bound with her into a customs union, allowing for non-preferential fiscal duties, and the free interconvertability of currencies.

¹⁸Much of the description and analysis concerning the implication of the Ivory Coast's associate membership in the EEC is taken from Roger Lawrence, "Primary Products, Preferences, and Economic Welfare: The EEC and Africa," in Peter B. Kenen and Roger Lawrence, The Open Economy, New York: 1968.

¹⁹France, itself, is an exporter of hardwoods, though some Ivory Coast timber is imported for special uses.

²⁰This price was maintained despite the excess of Franc Zone cocoa production over French consumption because of the creation of a special tax of .9 francs per kilogram of cocoa exported to France from her colonies with an exemption for those who exported an equal quantity to countries other than France. The price of cocoa in France in 1934 was about 25% greater than the average price on the New York cocoa market.

²¹This amounted to almost two-thirds of the F.O.B. price.

²²Whereas in the period 1929-1933 colonial coffee accounted for only 6% of French imports, that figure had risen to 32% by 1935.

²³The Ivory Coast quota for the 1959-1960 season was 83,000 tons and for 1960-61 it was 93,000 tons. This was almost equal to the quantities ^{being} exported to these two countries.

²⁴The economic characteristics of the Ivory Coast described here are taken from a reclassification of the national accounts for the years 1960 through 1967 undertaken by the author in order to put them in a form comparable to that recommended by the United Nations until recently. Access has not yet been gained to estimates made for later years, but the inclusions of these estimates would not substantially modify the results. For reasons to be suggested later, moreover, the period up until the last few years of the 1960's is that which most interests us here.

²⁵One constraint in the use of European personnel which existed in other industries, pressure for Africanization, was much less important in the timber industry because Europeans working in timber camps were relatively inconspicuous and because the demand on the part of Ivorians for this work was not great.

²⁶It will be shown shortly that the amount of rent which did not accrue to the government does not appear to have been very great.

²⁷Hla Myint, "The 'Classical Theory' of International Trade and the Underdeveloped Countries," Economic Journal, vol. 68, June 1958, pp. 317-37. This concept refers to the possibility of achieving high rates of growth of output as land and labor with very low opportunity costs are reallocated to the production of exports under the impact of the opening of the country to foreign trade. Once these factors are completely absorbed in the export sector, the vent-for-surplus period of growth comes to an end and further increases in output can be achieved only by increasing the supplies of productive factors, including capital, or by improvements in technology.

²⁸It may be argued, in fact, that the Ivory Coast was very fortunate in the timing of its expansion of coffee especially, taking advantage, as it did, of the foreign exchange shortage in France following the Second World War which forced France to shift her coffee consumption away from the arabicas of Latin America. The dependence of the Ivory Coast on the French market then pressured France into supporting Franc Zone coffee prices during the late 1950's and early 1960's, and this, in turn, was a major reason for the sizeable assistance granted by the European Development Fund to compensate for the dismantling of these supports within the EEC.

²⁹Actual rates vary according to conditions of employment, origin of worker, and region of production. The rate of 200 francs includes an implicit valuation of food and lodging and may be compared with the legal minimum wage in 1964 of 178 francs. It is generally recognized that workers on African farms receive higher wages than do unskilled workers in the modern part of the rural sector, who might be expected to receive the legal minimum wage, but employment is more seasonal. On balance, it seems that 200 francs per day is, if anything, an overestimate, especially if the opportunity cost of family workers is less than that of hired labor.

³⁰During the period 1960-1967 the estimated number of hectares producing cocoa increased more than twice as rapidly as the number producing coffee. This is especially noteworthy because coffee can be grown in many areas in which cocoa cannot.

³¹This is not to say that there has been no open unemployment in the Ivory Coast but that most of it has been related to a rise in aspirations for something better than unskilled manual labor. Although employment of people with these higher aspirations in jobs suitable to their skills is desirable, this objective would not seem to take precedence over that of providing everyone with at least some kind of work throughout the year.

³²Because on virgin tropical forests are made up of mixed species rather than homogeneous stands of timber, several privately unprofitable trees must usually be cut down in order to get at the most valued species. Since the market for timber land is very undeveloped, and since timber companies retain concessions for relatively short periods of time, the only cost to the companies of cutting down unprofitable trees is that involved in the felling process itself. From a social point of view, however, the discounted present value of those trees if they were saved until export prices were higher at some time in the future is their opportunity cost, and it may be greater than the private cost of felling them today. By requiring firms to process a certain proportion of cut timber and then sell to the market at a loss, the government is causing them to absorb part of this opportunity cost to the benefit of the Ivoirian consumer. This is not the most efficient solution, however, since this cost is imposed in the felling of profitable species as well.

³³One might even ask whether the Ivoirian phenomenon of attracting wholesale immigration is not a politically and economically more viable solution for the small size of most African markets than is the painful and difficult road to economic integration.

³⁴Tiber Scitovsky, "Two Concepts of External Economies," Journal of Political Economy, LXII, April 1954, pp. 143-51.

³⁵Gary S. Becker, "Investment in Human Capital: A Theoretical Analysis," Journal of Political Economy, LXX, Supplement: October 1962, pp. 9-49.

³⁶Gerald K. Helleiner, Peasant Agriculture, Government, and Economic Growth in Nigeria, Homewood, Illinois: Irwin, 1966, pp. 178-84.

³⁷The value of land may be related to geography as well as to climate and soil conditions. Since cocoa and coffee are paid everywhere the same price, this is not an important consideration for these crops, though it is very important for timber.

³⁸Mathematically, the residual is given by

$$A = (p - t) X - c(L_1 + L_2),$$

subject to

$$X = X(L_1, A(L_2)),$$

with

$$\frac{\partial X}{\partial L_1}, \frac{\partial X}{\partial A}, \frac{\partial A}{\partial L_2}, \frac{\partial^2 X}{\partial L_1 \partial A} > 0$$

and

$$\frac{\partial^2 X}{\partial L_1^2}, \frac{\partial^2 X}{\partial A^2}, \frac{\partial^2 A}{\partial L_2^2} < 0,$$

where p is the price of output X , t is the tax rate, and c is the cost per unit of input L . L_1 enters the production function directly and L_2 is that part of input L necessary to maintain each unit of land at a constant level of quality. Assuming profit maximization, in equilibrium

$$\frac{\partial X}{\partial L_1} = \frac{\partial X}{\partial A} \frac{\partial A}{\partial L_2} = \frac{c}{p-t}.$$

The marginal product of L at the intensive margin just equals the marginal product of L at the extensive margin, and both are equal to real factor price. Other things equal, better land implies a higher value of the marginal product of L_2 , though in equilibrium more land on the margins of cultivation is kept in production so that the marginal product of L_2 is everywhere the same. The value per hectare of the intramarginal rents, however, is higher on better land. Note that if the price falls or the tax rate increases, output has to be reduced at both margins to regain equilibrium.

³⁶These were controls placed by the Franc Zone on exchange transactions in other currencies, there being no controls on currency exchange within the Zone. During the late 1960s exchange restrictions were reimposed and lifted several times, but this was solely due to the international monetary crisis of that period.

⁴⁰Hollis B. Chenery and Alan M. Strout, "Foreign Assistance and Economic Development," American Economic Review, LVI, September 1966, pp. 679-733.

⁴¹All growth rates, the marginal savings rate, and the marginal import ratio were obtained from linear trends fitted to time series.

⁴²The difference in the value of skills is not nearly as great as the difference in annual incomes, however, since workers in the timber industry have substantially less leisure time than those working in agriculture.

⁴³Input-output tables are estimated in the Ivory Coast each year on the basis of an annual industrial census but are used as a framework for the national accounts rather than to establish a set of parameters describing inter-industry relations.

⁴⁴E. Eshag and J. Richards, "A Comparison of Economic Developments in Ghana and the Ivory Coast since 1960," Bulletin of the Oxford University Institute of Statistics, December 1967, pp. 353-71.

⁴⁵In addition to the historical record noted earlier, Evenson and Kislev have collected data on scientific man-years which indicate that the Ivory Coast in 1967 spent more time in agricultural research than any other country in sub-Saharan Africa except Nigeria, Rhodesia, South Africa, and possibly Kenya. On a per capita basis research in the Ivory Coast clearly exceeded all countries except South Africa. See Robert E. Evenson and Yoav Kislev, "Investment in Agricultural Research and Extension: A Survey of International Data," Center Discussion Paper No. 124, Economic Growth Center, Yale University, August 1971.

APPENDIX TABLE

Timber, Cocoa, Coffee, and Total Exports from the Ivory Coast, 1892-1970

Year	Timber			Cocoa			Coffee			Total Value	
	Quantity (metric tons)	Value (000s CFAF)	Value (000s US \$)	Quantity (metric tons)	Value (000s CFAF)	Value (000s US \$)	Quantity (metric tons)	Value (000s CFAF)	Value (000s US \$)	(000CFAF)	(000s US \$)
1892	7,000	n.a.	n.a.	-	-	-	35	n.a.	n.a.	3,739	722
1893	5,760	n.a.	n.a.	-	-	-	33	n.a.	n.a.	4,362	842
1894	5,760	n.a.	n.a.	-	-	-	50	n.a.	n.a.	4,069	785
1895	3,640	n.a.	n.a.	-	-	-	26	n.a.	n.a.	3,706	715
1896	8,096	648	125	-	-	-	38	95	18	4,400	849
1897	18,550	1,484	286	-	-	-	45	113	21	4,715	910
1898	14,700	1,466	283	-	-	-	41	103	19	5,026	970
1899	6,700	605	116	-	-	-	24	62	11	5,816	1,123
1900	13,420	1,208	233	-	-	-	24	62	11	8,052	1,554
1901	10,700	963	185	-	-	-	72	72	13	6,218	1,200
1902	10,470	524	101	-	-	-	63	64	12	7,054	1,361
1903	13,530	677	130	-	-	-	75	76	14	7,613	1,469
1904	11,770	589	113	-	-	-	71	71	13	10,290	1,985
1905	9,600	552	106	2	2	.38	29	33	6	7,636	1,474
1906	10,000	678	130	2	2	.38	44	106	20	9,610	1,855
1907	20,000	1,139	219	2	2	.38	41	42	8	10,911	2,106
1908	18,000	2,793	539	3	5	.95	42	100	19	10,850	2,095
1909	15,910	800	154	5	10	2	29	44	8	11,790	2,275
1910	13,760	689	133	8	15	3	34	52	10	15,750	3,040
1911	23,800	2,262	436	15	30	5	21	32	6	18,240	3,521
1912	30,500	2,897	559	21	42	8	28	42	8	17,620	3,400
1913	52,650	5,013	967	47	47	9	11	21	4	16,400	3,166
1914	41,050	3,264	630	35	44	8	30	6	1	8,566	1,655
1915	17,870	n.a.	n.a.	114	n.a.	n.a.	11	n.a.	n.a.	7,179	1,386
1916	8,130	813	156	186	280	54	41	81	15	9,333	1,801
1917	12,820	1,282	247	317	475	91	27	55	10	11,810	2,279
1918	22,400	3,007	580	420	556	107	110	75	14	13,160	2,540
1919	24,600	3,422	471	959	1,816	250	110	284	39	28,480	3,921

APPENDIX TABLE: Continued

Year	Timber			Cocoa			Coffee			Total Value	
	Quantity (metric tons)	Value (000s CFAF)	Value (000s US \$)	Quantity (metric tons)	Value (000s CFAF)	Value (000s US \$)	Quantity (Metric tons)	Value (000s CFAF)	Value (000s US \$)	(000CFAF)	(000s US \$)
1920	46,000	20,360	1,423	1,036	2,655	185	17	86	6	59,860	4,184
1921	56,900	25,620	1,899	1,486	3,708	274	12	44	3	43,840	3,249
1922	59,600	n.a.	n.a.	2,363	5,640	457	63	227	18	48,530	3,936
1923	72,900	n.a.	n.a.	3,600	8,279	499	112	400	24	62,620	3,776
1924	101,500	n.a.	n.a.	4,299	9,718	503	94	386	20	111,800	5,779
1925	92,300	n.a.	n.a.	6,278	15,110	711	52	254	11	117,100	5,513
1926	107,300	101,400	3,225	6,837	27,000	858	117	1,000	31	213,800	6,821
1927	118,500	115,300	4,525	7,808	59,200	2,323	187	1,800	70	235,500	9,230
1928	103,100	87,000	3,415	16,515	106,300	4,173	239	2,200	86	253,100	9,920
1929	101,900	80,400	3,149	16,314	97,900	3,834	405	3,700	144	261,500	10,230
1930	90,900	83,000	3,257	22,240	105,600	4,144	445	3,800	149	253,200	9,937
1931	52,520	37,300	1,462	19,900	64,900	2,544	726	3,800	148	133,300	5,225
1932	27,690	20,200	793	25,780	73,000	2,867	1,328	6,100	239	115,400	4,533
1933	41,940	14,300	695	30,910	60,100	2,921	1,699	8,400	408	108,000	5,250
1934	43,830	16,900	1,110	41,590	59,100	3,883	2,604	13,000	854	116,700	7,667
1935	46,020	16,500	1,089	43,560	56,600	3,735	5,183	25,900	1,709	138,100	9,115
1936	47,190	14,800	885	49,760	71,900	4,302	6,484	32,400	1,938	182,300	10,910
1937	81,910	32,300	1,284	48,060	149,100	5,930	10,080	50,400	2,004	324,400	12,900
1938	65,690	29,200	835	52,720	172,400	4,932	14,080	75,600	2,163	380,100	10,870
1939	42,840	21,200	532	55,190	138,400	3,475	17,960	88,300	2,217	328,800	8,257
1940	23,220	n.a.	n.a.	45,360	n.a.	n.a.	15,610	n.a.	n.a.	303,800	6,076
1941	3,523	n.a.	n.a.	42,960	n.a.	n.a.	28,410	n.a.	n.a.	n.a.	n.a.
1942	8,135	n.a.	n.a.	28,590	n.a.	n.a.	19,800	n.a.	n.a.	568,400	13,680
1943	2,410	n.a.	n.a.	543	n.a.	n.a.	22,890	n.a.	n.a.	362,700	7,254
1944	11,360	n.a.	n.a.	14,670	n.a.	n.a.	24,100	n.a.	n.a.	528,500	10,570

APPENDIX TABLE: Continued

Year	Timber		Cocoa		Coffee		Total Value				
	Quantity (Metric tons) (000s CFAF)	Value (000s US \$)	Quantity (Metric tons) (000s CFAF)	Value (000s US \$)	Quantity (Metric tons) (000s CFAF)	Value (000s US \$)	(000CFAF)	(000s US \$)			
1945	10,070	n.a.	n.a.	26,940	n.a.	n.a.	37,870	n.a.	n.a.	818,300	16,370
1946	41,050	76,500	1,091	28,340	236,500	3,375	36,280	490,300	6,998	1,063,000	15,170
1947	48,720	94,000	1,341	28,050	306,800	5,235	42,680	1,080,000	15,410	1,934,000	27,600
1948	78,980	287,600	2,340	41,220	1,531,000	12,460	55,390	2,502,000	20,360	5,197,000	42,290
1949	77,920	354,600	2,497	56,030	4,129,000	29,080	61,010	4,068,000	28,650	10,270,000	72,320
1950	106,000	589,700	3,369	61,690	4,705,000	26,890	54,190	6,675,000	38,140	13,770,000	78,680
1951	131,100	1,065,000	6,085	55,450	6,149,000	35,140	59,540	9,129,000	52,160	17,480,000	99,880
1952	75,330	618,300	3,533	50,170	6,172,000	35,270	64,100	10,620,000	60,680	18,810,000	107,500
1953	127,800	921,600	5,266	71,690	7,281,000	45,030	50,420	8,947,000	51,120	19,080,000	109,000
1954	131,500	1,603,000	5,731	52,700	8,833,000	50,474	88,290	16,940,000	96,800	27,310,000	156,100
1955	169,400	1,273,000	7,274	75,200	11,058,000	63,190	84,800	11,960,000	68,340	25,580,000	146,200
1956	214,600	1,207,000	7,240	75,750	8,405,000	48,030	118,700	15,130,000	86,460	26,340,000	150,500
1957	263,000	1,948,000	11,130	66,500	6,318,000	36,100	101,200	13,960,000	79,770	24,430,000	139,600
1958	401,200	3,316,000	17,130	46,330	6,415,000	33,140	112,500	18,780,000	97,020	31,490,000	162,700
1959	444,200	4,030,000	16,320	63,260	10,610,000	42,980	104,700	16,000,000	64,820	33,820,000	137,000
1960	654,800	6,342,000	25,690	62,870	8,732,000	35,370	147,500	18,680,000	75,670	38,800,000	157,200
1961	792,600	8,336,000	33,770	88,470	9,816,000	39,770	153,800	20,174,000	81,720	47,120,000	190,900
1962	915,100	9,282,000	37,600	101,000	10,550,000	42,740	142,600	18,930,000	76,690	47,690,000	193,200
1963	1,155,000	12,450,000	50,430	99,730	11,280,000	45,690	182,100	24,470,000	99,130	56,820,000	230,200
1964	1,526,000	17,860,000	72,350	124,300	14,530,000	58,860	204,300	31,720,000	128,500	74,500,000	301,800
1965	1,550,000	18,470,000	74,820	126,400	10,910,000	44,200	185,700	25,890,000	104,800	68,420,000	277,200
1966	1,588,000	13,590,000	75,310	124,300	13,140,000	53,230	181,500	30,230,000	122,500	76,660,000	310,600
1967	1,840,000	21,780,000	88,230	105,200	13,880,000	56,230	149,000	25,420,000	103,000	80,300,000	325,200
1968	2,176,000	25,800,000	104,500	121,500	19,420,000	78,670	214,400	35,860,000	145,300	104,900,000	425,000
1969	2,695,000	35,120,000	135,200	118,900	26,350,000	101,500	178,300	30,170,000	116,200	118,223,000	425,200
1970	2,097,000	29,330,000	105,600	143,200	26,740,000	96,290	195,300	43,170,000	155,400	130,190,000	468,800

Notes Values in US \$ were calculated by dividing values in CFA francs by official exchange rates or annual means of free market rates when no official rates existed.

Source: Cosnier, Henri, L'Ouest Africain Francais, Paris: 1921; France, Ministère des Colonies, Statistiq^{ues} du Commerce, Paris: various years; France, Agence Générale des Colonies, Renseignements Généraux sur le Commerce des Colonies Francaises, Paris: various years; France, l'Agence Générale des Colonies, Bulletin, Paris: various issues; Cros, Louis, L'Afrique Francaise pour Tous, Paris: 1928; French West Africa, Agence Economique, Bulletin Mensuel de l'Agence Economique de l'Afrique Occidentale Francaise, Paris: various issues; Ivory Coast Territory, Service de la Statistique, Commerce Extérieur de la Côte d'Ivoire et de la Haute Volta de 1931 à 1954, Abidjan: 1955; Ivory Coast Territory, Service de la Statistique, Inventaire Economique de la Côte d'Ivoire, 1947-1956, Abidjan: 1958; Ivory Coast, Service de la Statistique, Inventaire Economique et Social de la Côte d'Ivoire, 1947-1958, Abidjan: 1960; Ivory Coast, Direction de la Statistique, Bulletin Mensuel de Statistique, Abidjan: various issues.