The Market for Cocoa
And its Relevance to
African Production
OVERVIEW

The cocoa tree requires a tropical climate and production is confined to high rainfall areas up to 15° either side of the equator. The fruit of the cocoa tree is a pod containing up to 40 beans surrounded by mucilage. After harvesting the pods, farmers extract the beans and allow them to ferment in the sugar-rich mucilage before drying. The dried fermented beans are sold through a variety of intermediaries before being processed.

The processing of cocoa beans is quite complex and varies according to end use, but in principle the shell (the outer skin of the bean) is removed before roasting and grinding to a paste known as cocoa liquor. The liquor may either be used as an ingredient in chocolate or pressed to yield cocoa butter and a cake of dry matter. The cake can be milled to cocoa powder while the butter is another component of chocolate.

These semi-finished products (liquor, butter and cake) are used in the production of chocolate and a range of chocolate flavourings. A very small proportion is also used for cosmetic preparations based on cocoa butter. Figure 1 presents an outline of the use of cocoa beans. The figures incorporated in the diagram are indicative of the relative requirement for semi-finished products, but annual production will vary.

Figure 1 Outline of the Processing of Cocoa Beans (with indicative figures)
Appendix 1 lays out some of the basic statistics of the world trade in cocoa. Since cocoa beans must be converted to a paste (cocoa liquor) as a first stage in processing, the statistics of grinding are usually taken as a measure of consumption. The data in Appendix 1 show global production at 2.7mn tonnes with global consumption at 2.8mn tonnes. Figure 2 charts the balance of production and consumption since 1970.

### Figure 2  Global Production and Consumption of Cocoa

A number of features are apparent in the data:

- There is a geographical disjunction between supply and demand. Production is restricted to the tropics by the climatic requirements of the cocoa tree. Consumption is concentrated in the temperate regions.

- West Africa is the major producer of cocoa and the Côte d’Ivoire dominates the supply accounting for 42% of global output. Brazil and Malaysia show declining output.

- Most processing is completed in the consuming regions (70%) rather than at origin.

- Global consumption expands at a fairly steady rate (3.1% per annum since 90/91), while global production fluctuates annually with climatic variations. Production grows cyclically with rapid expansion followed by periods of stasis. Global production has expanded at slightly over 1% per annum since 90/91.

- Global oversupply throughout the 1980s led to a build up of stocks and a decline in prices. Stocks should now be declining as production has failed to keep pace with demand. However, the inaccuracies in estimating annual output and grinding of cocoa beans constrain reliable conclusions.
**COCOA PRODUCTION**

Global cocoa production continues to expand. Growth is not even, and there is significant variation between years as climatic influences, notably the phenomenon of *El Nino*, affect yields. Cultivation of cocoa is now more widespread than ever; paradoxically market share is highly consolidated with over 66% of global output based in West Africa. One consequence of such concentration is a high annual variability, where the minor producers are unable to provide replacement supplies during years when West African output fall below the trend.

**Africa**

Cocoa was introduced to Africa in the late nineteenth century. Once established in Ghana, cocoa production expanded rapidly and Africa became the main producer by the mid-1920s. The continent is now responsible for some 68% of the world crop and production is centred in West Africa with Côte d'Ivoire, Ghana, Nigeria and Cameroon being first, second, fifth and sixth respectively in the world rankings of producers.

As Africa came to dominate the world crop, so the global trade followed the African production season, with the predominant Amelonado type yielding a main crop from September through to December and a minor or mid-crop (around 10% of the total annual production) from late April. Since the first cocoa of the season was available from early October, the accepted crop year for cocoa runs from 1st October through to 30th September.

Production of cocoa in West Africa has moved westwards since the 1950s and Côte d'Ivoire now dominates the global supply. Amelonado is no longer the principle planting variety and a new generation of hybrids, bred for precocity and yield, are now widely planted. The hybrids have a less distinct crop-ing pattern, tending to yield more evenly through out the year, and there is less distinction between the main and mid-crop. Nevertheless, the drier weather during the first and second quarter of the year, while the later pods mature, leads to smaller beans.

**Côte d'Ivoire**

Annual production in Côte d'Ivoire is now around 1.1mn tonnes per year, having grown dramatically from some 260,000 tonnes in 1980. The country is responsible for 41% of global supply. There are a number of reasons behind the cocoa boom in Côte d'Ivoire including government campaigns, the opening up of virgin land in the west through logging activities, the construction of roads and bridges leading to the developing port of San Pedro and the relocation of farmers to the west either because of lowering yields elsewhere or through lands flooding under dam construction. The country also enjoyed extensively available land as well as a good supply of migrant seasonal labour from Burkina Faso to the north. Cocoa provided a comparatively good income as well as independence. Enthusiasm for cocoa continued as the government struggled to keep the producer price of cocoa supported.

The quality of the Ivoirien cocoa beans has always been considered mediocre and the beans tend to trade at a slight discount to the terminal market. In the early 1980s a consortium of British chocolate manufacturers (under the Biscuit, Cake, Chocolate and Confectionery Alliance) set up a project to investigate the reasons behind the difference in quality between Ivoirien and Ghanaian cocoa beans. They found that the Ivoirien farmer was capable of producing Ghanaian type beans but that there was no commercial incentive to do so.

**Ghana**

The first plantings of cocoa on mainland Africa were made in Ghana over 100 years ago. Since then Ghana's reputation as a cocoa producer as grown, peaked, collapsed and revived. Throughout there has
been a tradition of good preparation among the farmers supported, from the creation of the Cocoa Marketing Board, by a policy of quality control at the buying station. The premium for quality beans was all or nothing: if the standards were not met the beans were not bought. Further controls between buying station and shipment served to develop the reputation of Ghanaian beans.

Ghana currently produces some 400,000 tonnes, and the commercialisation and export is largely under the control of a marketing board. The controls will be lifted in 2000. Ghanaian output peaked in 1964/65 with a crop of 566,000 tonnes (at a time when neighbouring Côte d'Ivoire produced less than 100,000 tonnes). Subsequently, mismanagement of the marketing, disintegration of the extension service, degradation of the main producing areas with swollen shoot disease, all combined to a collapse in production to 159,000 tonnes in 1983/84. Subsequently, the fortunes of the Ghanaian cocoa producer have revived under a World Bank project and a strengthening economy.

**Nigeria**

Nigerian production of cocoa in 1997/98 is estimated at 160,000 tonnes. Recent figures show a relatively stable pattern of production over the last few years. There is a long history of cocoa production in Nigeria, and the beans are popular for the good well-prepared flavour, but trading conditions have long been difficult. Nigeria was the first African cocoa producer to abandon a marketing board, which was summarily disbanded in 1986/87. Since then, turbulent trading conditions have deterred a number of players entering the market, and the export and purchase is usually left to specialists.

**Cameroon**

The smallest of the major African producers Cameroon output averages around 115,000 tonnes of cocoa per year. Production is relatively stable. The cocoa is valued in the industry for the red powder that the beans yield, which is useful for the baking industry. The bean quality is generally good, although since the liberalisation of export marketing in 1991 quality has deteriorated.

**America**

In the wild, the natural range of the cocoa tree spreads across northern South America. Europeans first became aware of cocoa in the exploration of Mexico during the sixteenth century when Spanish invaders found the Aztecs using the beans for coinage as well as a beverage. Initial cultivation by Europeans established cocoa in the Caribbean and northern South America, and this region led global output until the 1920s. Today, cocoa is produced in significant quantities by 20 countries throughout the Caribbean, Central America and South America.

**Brazil**

The natural range of cocoa spreads across the Amazon region and cocoa has been grown commercially in Brazil since the early nineteenth century. It was the introduction of cocoa into the coastal state of Bahia that led to the rapid development of cocoa as an export crop. By the 1930s Brazil had become the major producer of cocoa in South America, and the high prices of the 1970s and government promotion combined to push production to a peak in 1990 with almost 370,000 tonnes.

Throughout the development of cocoa in Bahia strict quarantine regulations were imposed on the import of living material from the Amazon basin. Until the 1990s, these measures successfully excluded the fungal parasite *Crinipellis perniciosa* which causes Witches Broom disease and limits the cultivation of cocoa around the Amazon. However, infected brooms appeared in Bahia in the 1990s, apparently introduced deliberately, and the consequences have been disastrous. Brazilian output has fallen to 170,000 tonnes; farms have been abandoned, or turned over to cattle rearing, and unemployment has risen dramatically.
The probability of the producers recovering is small. Control measures are expensive and not viable at current price levels. Plant breeding work is showing some promise in the search for resistance or tolerance but a practical solution is remote.

**Ecuador**

The second largest producer in South America is Ecuador with an annual output around 80,000 to 100,000 tonnes. The production here is variable as the country is strongly influenced by the irregular climatic phenomenon of *El Nino*. A shortage of extension and a somewhat disorganised trade has led to a decline in the productive ability of the country, which once had a reputation for its fine flavoured cocoa, the *Arriba* type.

**Dominican Republic**

Among the other producers the Dominican Republic is notable although output here is only some 50,000 to 60,000 tonnes per year. The cocoa, known as *Sanchez*, is important to the North American market as it yields an African type hard butter. In other terms, such as preparation and flavour, the cocoa is of low quality, largely because it is under-fermented, and accordingly the beans trade at a discount.

**Caribbean**

Once the centre for cocoa production, a number of Caribbean islands continue to supply cocoa. The importance of the area now rests with the fine cocoas rather than the volume of production. Trinidad maintains an active research centre.

**Asia**

Asia has emerged as a significant supplier of cocoa in the past thirty years. Cocoa was introduced to the region in 1560, and it has been cultivated commercially in Indonesia and Papua New Guinea for much of this century. PNG was the dominant producer in the area up to the mid-1970s but its share of the global market was small. Production here has declined, while first Malaysia and then Indonesia developed cocoa output.

**Malaysia**

Malaysia became a force in world cocoa supplies during the 1970s when cocoa production grew rapidly. Poor returns from oil palm and improving cocoa prices led plantation companies to switch into cocoa cultivation building on the success of experimental work in Sabah. Smallholders too took up the crop and by 1989/90 output had reached 243,000 tonnes. However, by this time world prices had fallen to levels that the plantation companies found uneconomic and there has been widespread removal of cocoa from the larger operations. Plantation style cultivation is more aware of production costs, better able to calculate the opportunity costs and, in a labour intensive crop such as cocoa, less able to compete than smallholders. The switch to other crops has been dramatic and production has fallen to some 90,000 tonnes per year at the end of the decade. Smallholders are responsible for most of the production.

**Indonesia**

Dutch growers and researchers developed cocoa production in Java during the early part of the century and by the 1940s a distinctive type of fine cocoa had been developed. Production however remained limited until the late 1970s when plantations in Sumatra began to copy their Malaysian neighbours. However, it was the smallholders of Sulawesi that initiated the boom in production, as they returned from working on the plantations of Malaysia, bringing with them the material and technology for cocoa cultivation. The
consequence has been a rapid rise in output with Indonesia now providing over 300,000 tonnes per year with further growth forecast. Certainly, the acreage exists for production increase, as trees come to their full bearing age, but the appearance of the pod borer is a serious threat to the cocoa.

At current world prices, the plantations in Indonesia are less enthusiastic about cocoa and no doubt there will continue to be replacement with more profitable crops, but the smallholder is the backbone of Indonesia’s industry and costs in this sector are comparatively low. Further, the short marketing chain in Indonesia allows the farmer a high proportion of the export value of the crop. If pests can be controlled, Indonesia will maintain its place in the top three producers.
COCOA CONSUMPTION

The primary use of cocoa is confectionery, and, as a non-essential food item, consumption is dominated by the developed economies. Some of the physical properties that cocoa butter brings to chocolate, such as the melting point and sensation in the mouth, are most appropriate to consumption in cooler climates and the commercialisation of cocoa has always been focused on the more northern markets.

Figure 1 showed an outline of the use of cocoa beans with the first stage of processing represented as grinding. Since all cocoa beans must pass through this stage, and can only pass through once, analysts usually use the grindings as a measure of consumption. Although there are shortcomings (the intermediate products might be stored rather than used for example) the measure is preferable to other options, such as recording imports, which give no indication of usage, or consumption by end user, where a plethora of recipes weaken the accuracy of estimates.

Table IV in the Appendix here shows that the progress of consumption as measured by grindings since 1970. World grindings of cocoa beans have increased from some 1.36mn tonnes in 1970 to an estimated 2.81mn tonnes in 1997/98. The excessively high prices of the 1970s held back growth in consumption, but since then rate of growth in demand has been relatively steady in response to global economic and demographic growth as well as falling commodity prices. By the early 1990’s the market had moved into structural deficit as consumption exceeded supply, and at present there is an approximate balance. Falling demand in Russia and the Former Soviet Union, together with the poor economic performance of the Far East, have checked growth in demand for cocoa. This pause in the growth rate is likely to be temporary as the low prices start to stimulate growth again and as the Far Eastern economies recover.

Among the consuming countries, Table IV shows the European grind as 43% of the global total. The Netherlands leads the world processing of cocoa with an annual requirement of almost 400,000 tonnes of beans, some 15% of global demand. Although Dutch per capita consumption of chocolate confectionery is relatively high, the processing industry is export orientated, and 38% of global exports of cocoa butter originate in Holland. In 1970 the Dutch grind made up 8% of the World total and the growth here, to 15%, is a clear demonstration of the consolidation in the industry. There are significant economies of scale in cocoa processing, which the Dutch industries have increasingly exploited, together with the proximity of stocks in Amsterdam and Rotterdam, which are the major European ports of arrival for cocoa.

Influence of cocoa butter alternatives

In the last thirty years research has yielded a number of alternatives to cocoa butter. Based on different starting materials, the properties of these compounds and their use vary. The terminology has become complex, with cocoa butter substitutes (CBS) cocoa butter extenders (CBX) cocoa butter equivalents (CBE) and so on through CBI, CBA, CBM and CBR to name a few. Broadly there are three families of alternatives to cocoa butter:

1. Cocoa Butter Equivalents (CBE) - have the same chemical and physical characteristics as cocoa butter. They can be used interchangeable and in conjunction with cocoa butter. Cocoa butter improvers (CBI) are a particular type that improve the heat resistance, giving a butter that is harder than Malaysian cocoa butter.

2. Cocoa Butter Substitutes (CBS) - are blended from the lauric oils of coconut and palm kernel extracts. They behave in a similar way to cocoa butter, but cannot be used together with cocoa butter since the combination behaves quite differently. They can only be used with low fat cocoa powders.
3. Cocoa Butter Replacers (CBR) - are miscible with cocoa butter, but have limited compatibility. They are derived from bulk oils (soya/rape/palm/cotton) and used in confectionery and bakery products where particular characteristics are called for.

The most important group to the cocoa bean industry are the CBE’s that can be used in chocolate manufacture. CBEs can be manufactured from a number of speciality and exotic fats including, shea, sal, kokum, mango kernel and illipe. CBEs confer a number of advantages to the chocolate manufacturer:

1. Compatibility with cocoa butter
2. Confer ability to compensate for the variability in cocoa butter
3. Improve hardness of the fats
4. Improve heat and bloom stability
5. Improve milk fat tolerance
7. Economy

With these advantages, a number of industries have used CBEs in chocolate for over 40 years. However, a number of major players in the industry equally oppose the use arguing that the use of CBEs lowers the quality of the product and damages the market for cocoa beans. Within the EU a number of countries permitted the use of CBEs in chocolate while others did not. Attempts to harmonise this situation across the EU member states led to the longest running argument on legislation in the history of the EC. It finally reached resolution this year, 1999, and in due course all countries will permit up to 5% non-cocoa fats in the products defined as chocolate.

The impact of this legislation is difficult to gauge: the ICCO calculated that widespread adoption of the 5% rule could lead to the substitution of up to 180,000 tonnes of cocoa beans per year. This is probably unduly pessimistic, since the price incentive is not sufficiently strong and not all manufacturers wish to make use of substituting with other products, particularly if marketing on the basis of purity or supposed quality. Further, there is an argument that CBEs could stimulate consumption by conferring economic and technical benefits to the product so that low consumption markets such as southern Europe might be expanded.

In any event, the impact to the EC legislation will not be immediate, since individual member states have some time to enact legislation and manufacturers will not switch recipes immediately.
MARKETS and INTERNATIONAL TRADE

Two inter-linked markets handle trade in cocoa beans. The physical market describes the buying and selling of cocoa as a tangible commodity, while the futures market sets prices for transactions in the future by exchanging promises to deliver or receive cocoa. The markets are linked: the balance of supply and demand in the physical market, together with perceived balance in the future, is reflected in the price on the futures market, while the futures price is used to determine the contract price in the physical market.

Structure of the Physical Markets

As the cocoa trade expanded rapidly during the early years of this century, London, Paris and New York became the foci of the physical trade. The formation of trade associations in these centres led to the development of contracts, specific to each market. These contracts, albeit modified, continue to govern the trade in almost all cocoa today.

Exporters

For the most part, exporters are concerned with cocoa beans rather than the intermediate products of butter, liquor or powder. Processing at origin is poorly developed for a number of reasons, some of which are discussed below.

The degree of state intervention in the marketing arrangements of the cocoa trade varies between producers. Broadly there are two types: direct control, such as the marketing boards which are to be found in Ghana and a number of small producers in the South Pacific, and indirect intervention in the free market arrangements as seen in all other producers. Under a free market the government can still be involved through taxes or quality control, for example. Under the direction of the World Bank and other international donors, the Caisse de Stabilisation arrangements of Côte d'Ivoire have been dropped in favour of a liberalised system of marketing. The marketing board of Ghana is due to be liberalised in 2000.

The Ivoirien system was liberalised in August 1999 and it is yet too early to assess the impact. The impact of the liberalisation in Côte d’Ivoire is currently the subject of much speculation. It is an emotive issue, since the economy and the Government budget are heavily dependent on cocoa exports. Nevertheless, the old system of allowances, based on calculated marketing costs, was widely seen as unduly generous, implying that the farmers were subsidising the profits of the up-country buyers and shippers.

At an international level, observers are concerned that liberalisation in Côte d'Ivoire might adversely affect quality, as had been seen in Nigeria and Cameroon, as well as reducing confidence in the trade. There is no doubt that liberalisation of cocoa markets elsewhere in West Africa upset the stability of the market, but each situation is different and must be analysed independently. The subject is too involved for discussion here, but it is likely that:

- the transitional period will be chaotic.
- producer prices will be volatile for a period.
- producer prices will rise in the medium term above current levels.
- quality will suffer - state controls in the interior were lifted earlier and quality deteriorated.
- the total number of shippers will decline.
financing of the trade will become a major problem. The lack of liquidity means that either local banks must find financial sources overseas or the shipper must look for credit externally.

- the small scale export operations will be high risk. The overseas trade will be unwilling to deal forward with them, and they will not have the ability to hedge future sales on the terminal markets.

- shippers will have to store cocoa

In order to secure their supplies in view of the risks, the major dealers have formed alliances with exporters in the Côte d’Ivoire. This will benefit the exporters in that they gain protection from the volatility of the global market as well as better access to finance. However, given the consolidation amongst the international trade, these strategic alliances place the unallied exporters at a huge disadvantage and the market loses the diversity of players.

Producer prices are a particular concern with the impending liberalisation in Ghana. Here, the government has recently guaranteed the farmers among the highest prices of all producers in the World. It is unlikely that these levels can be maintained in view of the current world market.

**Shipping**

Traditionally, cocoa is shipped in jute bags of some 60kg weight. Recently the Dutch trade has experimented with loading cocoa loose in containers and also loose in the ship’s hold (known as mega – bulk). Although the methods require some specialised equipment for loading and unloading, the costs savings on this mode of transport and on storage are substantial.

While shipping in bags will not disappear, bulk transport will develop further, as it is well suited to the consolidating processing industry where individual operations need large volumes for delivery.

**Dealers and Processors**

Cocoa is traded internationally in the form of beans or as semi-finished products. Chocolate manufacturers may grind their own beans, particularly for liquor, or buy semi-finished products from processors.

Until recently, the manufacturers and processors rarely bought direct from origin, unless based there, but acquired their beans through a network of trade houses and brokers. Dealers earned their margins by providing a wholesaling service, by assuming the counter-party risk, and by managing the price risk as well as finding any profit between fob and delivery that might be available.

The last 12 years has seen the number of players contract dramatically as a result of mergers and take-overs:

- 80% of global manufacturing capacity is now held by just five companies (Mars, Hershey, Nestlé, Cadbury, Ferrero)
- Processing is concentrated in the hands of Klaus Jacobs (450,000 tonnes annual cocoa bean requirement), ADM (400,000 tonnes) and Cargill (300,000 tonnes).

The number of dealers has declined as margins have been squeezed, and the consolidation of the industries has demanded a greater capacity to supply from the remaining players. It is estimated that five players control 80% of the trade.
The consolidation in the trade is also reflected in the number of cocoa members of the London Commodity Exchange, which fell from 145 in 1985 to 49 in 1995.

As competition intensifies inexorably, further control of the margins is to be found in reduced stockholding and in moving up-stream in the supply chain. Thus the number of independent dealers has declined dramatically and most cocoa passes into the hands of the big processing companies through their own origin-based procurement activities.

Further consolidation is forecast: some analysts predict that confectionery manufacturers will reduce their role in making chocolate by sourcing chocolate from processors in order to focus on product assembly and brand management.

Processing at Origin

Mostly cocoa is ground in the consumer countries, and even with recent developments in new capacity at origin, the total grind in cocoa producing countries is no more than 30% of the global figure. Although it has often been promoted as a means of adding value to the beans before export, there are various arguments against processing in the country of production. These include:

- The availability of beans – the European based processor can source beans from all producing countries through out the year. At origin, beans must be stored to provide a consistent flow of feed stock for the factories, and cocoa storage in the tropics is not practical
- Bean price – the dealer/processor, located in the consuming country, can select raw material from stored cocoa beans of various origins and prices
- Many European chocolate factories prefer deliveries of cocoa butter in bulk tankers. This is easier to arrange for local processors. Butter is usually exported in 25kg cartons that must be opened individually and melted. (There is a factory in France that provides this service).
- Just-in-Time delivery can be organised to a neighbouring chocolate manufacturer.
- European produced cocoa butters trade at a premium up to 25% above the African butters.
- The capital costs of building and operating a cocoa processing plant are more significant than the labour costs where a cocoa producing country might show some advantage.

The Futures Markets

Those involved in the trade of cocoa have two futures, or terminal, markets on which to manage their risks. The London International Financial Futures and Options Exchange (LIFFE), and the Coffee, Sugar and Cocoa Exchange (CSCE) in New York together handle all futures markets transactions for cocoa. The contracts in both are essentially similar, though details, and obviously currency of the price, vary between market.
QUALITY STANDARDS AND SPECIFICATIONS

Chocolate recipes incorporate a number of different raw materials, and for most chocolate a blend of beans is used. The origin of the cocoa beans used in the chocolate preparation is usually unknown to the final consumer, who is also unaware of the quality issues involved. This situation contrasts with the market for coffee, for example, where origin and quality are becoming increasingly important to the final consumer. There are some chocolates marketed as single origin, but their market share is insignificant.

Although cocoa quality and origin may not be immediately and obviously important to the chocolate eater, the confectionery manufacturers must constantly strive for the highest levels of quality in such a competitive consumer market. The issues of cocoa quality are complex and can be looked at on a number of levels from simple cleanliness of the bean parcel, through bean preparation by the farmer, to intrinsic factors of genetic origin where there is no human influence.

The manufacturer requirements are extensive and relate to:

1. Flavour – a combination of genetic factors influencing the varieties, as well as issues of preparation to bring out the flavour while avoiding off flavours
2. Purity and wholesomeness – foreign material, pesticide residues etc
3. Consistency or homogeneity - variable parcels are difficult to handle
4. Yield – the size and uniformity of the beans will determine the butter yield
5. Characteristics of the butter – presence of FFAs, and the hardness of the butter
6. Colour – of the powder

All these have some influence on the price of through the market’s understanding of typical cocoa quality from any origin.

While the farmer can only influence some of these factors, the cocoa can barely be improved after sale from the farm. The local trader may have some influence in drying the beans or grading a parcel, but he is largely limited to maintaining quality levels, as are all subsequent steps in the marketing chain.

Standards

Export standards are imposed by a number of cocoa producing countries with varying degrees of success. These standards and the standards included in the major contracts generally cover the same factors but tolerances differ. The standards are concerned with:

- Bean count per 100 g (ie bean size)
- Defects in the beans, such as mould or inadequate fermentation
- Moisture content
- % Foreign matter

The faults are assessed by performing a cut test on a sample of beans.

Among the international standards are the contracts of the AFCC (the French cocoa trade association), the CAL (the UK cocoa trade association), the CMA (the US cocoa trade association). Each varies slightly in the tolerance levels, though recently the CAL and the AFCC have harmonised their contracts. The Food
and Agriculture Organisation (FAO) of the UN also issues a model ordinance that is often the basis of the exporters’ specifications.

**Maintaining Quality**
The key to developing and maintaining quality is a price differential. Without a premium there is no incentive for the farmer, or others in the marketing chain, to take more care over the preparation and handling of the beans. Unless the market is willing to pay a premium, quality will suffer. Ghana and Côte d’Ivoire show the two extremes of this practice; in Ghana sub-standard beans either cannot be bought by the government buying agents or are purchased at a substantial discount, while in Côte d’Ivoire the buying system encourages the rapid and indiscriminate evacuation of all cocoa from up-country. The consequence is a premium for Ghana cocoa on the market over the Ivoirien beans, even though it has been demonstrated that Ivoirien farmers are capable of producing Ghanaian quality.

**Fine Cocoa**
There is no definition of fine or flavour cocoa, and opinions differ on the range of beans that should be included in the term. In the strict sense, fine cocoa is produced by Criollo and Trinitario genotypes and has fairly specific uses in quality dark chocolate. Total production is probably less than 90,000 tonnes per year and is derived mainly from Central America and the Caribbean, as well as Papua New Guinea and Indonesia. Note that for many of these producers fine cocoa is only a small fraction of total output.
COCOA BEAN PRICES

The link between the physical and futures markets was mentioned above, with the futures price forming the basis of transactions in the physical market. The price of cocoa responds to a number of influences including the availability of beans at present and as expected in the future, as well as more technical issues of the analysis of price movements. It is particularly sensitive to sentiment among the major players and detailed analysis of supply and demand only covers part of the story. The presence of stocks in Europe and the US clearly influence the price, and the ratio of stocks to the annual requirement of the processors is a key element in moving the price. However, the size of the stocks can only be estimated, since there is a portion that is 'invisible' as either held confidentially by warehouse keepers or in factory inventories, and other factors such as crop forecasts also play a role.

Recent History

The second position on the futures markets is usually used as an indicator of the state of the market and Figure 3 below shows the movement of cocoa prices over the past 15 years.

Figure 3  Cocoa Price History  Monthly Average of LIFFE 2nd Position

From the elevated levels of 1985, prices fell away as new cocoa production came on stream from plantings in the late 1970s. The market entered a period of structural surplus (see figure 2) as more planting in the early 1980s came into bearing. The imbalance of supply and demand drove prices down to a nadir in 1992, and these levels apparently restrained further production increases, and possibly stimulated consumption. Supply and demand reached a better balance, and several years of approximate equivalence during the mid-1990s allowed the market to stabilise at around £1,000 per tonne.

A slight rise during 1997/1998 was seen by some observers as indicating mounting fears in the market over the approaching liberalisation in Côte d'Ivoire. The anticipation of supply difficulties is supposed to have led to a stockpiling of cocoa and forward covering by the manufacturers. However the market turned dramatically during the second quarter of 1998, and prices have plummeted under a series of downward pressures including reduced consumption, notably with the collapse of the Russian economy and continued difficulties in Far East markets, as well as improvements in production prospects. Prices are now
approaching the earlier lows of 1992, and currently show no signs of regaining the levels of eighteen months ago.

Attempts by the ICCO in the 1980s at regulating the price of cocoa through a buffer stock failed, and from 1993 the stock was released gradually into the market. In the current climate of free markets, it is unlikely that any other regulating mechanism will be applied, although the cocoa producers’ organisation and certain African governments are discussing withholding schemes.

**Future**

Opinion is divided as to the near term future of the market: some analysts project a period of weak prices dominated by production surpluses, while others, including the ICCO, forecast a string of deficits and strengthening prices. However, as noted earlier in this paper, there is no convincing evidence of either a structural surplus or deficit in the market. Production and consumption are broadly in balance, though the recent down turn in consumption may alter this, but where we might expect continued growth in demand of some 3 per cent per year, there is little to suggest that production will continue to grow.

In fact, with production now so concentrated in West Africa and Indonesia, we can expect increased volatility. The minor producers usually act as a buffer to volatility in global output, since exports increase when production falls in the major players. However, as the significance of the contribution from the minor players falls while global output expands, so the smaller producers are less able to fill in when West African yields are below average.

**Influence of Quality**

The futures market provides a standard contract for cocoa, and cocoa can be delivered or taken up against this contract. In consequence, the physical market and the futures market are tied together, but it is acknowledged that bean quality varies between origins. To allow for this variation, the beans are traded at premia or discounts with the price differential reflecting the intrinsic value of the bean. In the physical markets, traders agree a price based on the terminal market price nearest the shipment date, which is modified by a premium or discount according to the origin. On the physical market this differential is not fixed: it will reflect the markets need for that growth of cocoa and its availability, real or forecast.

On arrival the buyer may make a claim against the shipper if the cocoa does not meet the accepted standards for quality.

The terminal market too recognises the difference in intrinsic value of the beans and there are fixed premia and discounts for the delivery of particular growths to the market. Further allowances are then made when the cocoa is graded before tender, in order to provide better control of the quality delivered to the market. A fixed scale of allowances is applied to a variety of factors such as bean count and preparation.

With the move towards bulk shipment and the storage of cocoa in bulk, LIFFE has drawn up a new contract to allow larger volumes than the 10 tonne lots to be delivered to the market. Simultaneously, the new contract seeks to further improve the quality of cocoa being delivered by adding further controls such as testing for the homogeneity of the parcel. This is an important development for rewarding quality from the producer since there is more incentive now for the dealer to pay a premium for quality: if the dealer is using the terminal market to hedge his trades the quality premium is also being protected.

**Fine Cocoa**

The market for fine cocoa is rather detached from the bulk cocoa market. The degree of independence varies according to the definition of fine grade, but, in the strict sense, the cocoas concerned cannot be
substituted by other origins and so the price moves separately. The values are often quoted as premia to the futures market price, but in reality this relationship is limited: the chocolate manufacturer who depends on Java beans for a particular product has little choice for substitution. Fine cocoas account for no more than 3% of total world supply, and, in Africa, are only relevant to Madagascar.

**Price of Cocoa Products**

Among the intermediate products, the value of cocoa butter is most directly related to the price of cocoa beans. The price of butter is usually in the range of 2-3 times the bean price. Given that the average yield of butter is around 40%, the ratio of butter to bean price is not significantly different from the yield. Processing costs and profits must therefore be secured through powder sales, and the powder price is less directly related to the bean cost. Moreover, the powder, which is in many respects a by-product of the processing industry, is sold for a range of different uses, while butter is exclusively used in chocolate. In the last 10 years, powder ratios have traded in the range of 0.56 to 1.026 of the bean price. Currently, butter ratios are around 2.45 while the powder is at 0.71 approximately.

Cocoa liquor is rarely quoted, as the trade in this product is limited. Manufacturers prefer to produce their own liquor since this is the component that gives the chocolate flavour.
PROSPECTS & CONCLUSIONS

The importance of Africa to the global cocoa economy, and the importance of cocoa to certain African economies, is obvious. Cocoa is a major component of the economies of Ghana, Côte d'Ivoire and Cameroon. It is also significant in Nigeria. The fall in world prices since the middle of 1998 is alarming particularly as the major producers of West Africa move away from government efforts at farmer price stabilisation. For the present, there are no indicators in the market which might provide support and it is widely assumed that the market could move further downwards. The longer term impact of a period of low prices is difficult to assess.

The current situation in supply and demand is one of broad equivalence: some observers argue that the market is in a position of structural deficit, based on the analysis here in Figure 4, which seems to show insufficient production. However, as noted earlier, the inaccuracies of estimations of global production, subsequent weight loss and final processing are at least as big as the current imbalance in supply and demand. We cannot be confident of the exact situation, and attempts to monitor stocks are equally insecure (Figures 5 &6).

Fig 4  Balance of Global Supply and Demand of Cocoa Beans

The best guide to the current situation is probably the price, which reflects the availability of cocoa to the markets. The move over the past 15 months, which has seen prices halved, suggests that the market is suffering from a surplus.

The low prices have pushed estate producers out of cocoa cultivation and into apparently better options of, for example, oil palm. In these situations, the costs and returns of cocoa growing are relatively clear and the management can take a decision based on hard data. However, most of the world’s supply of cocoa is provided by smallholders where the situation is far from clear. For the small African farmer with only a few hectares, the concept of a cost of production is not real: the set up costs are unknown and much of the annual labour is probably provided by the family. In this situation, the realistic evaluation is one of opportunity cost: what else might the farmer cultivate, or how else might he use his labour to get a better return?
Fig 5  European Stocks of Cocoa Beans + 2nd Position Price (LIFFE)

Fig 6  US Stocks of Cocoa Beans + Average Spot Price CSCE
Without obvious options, and in view of non-financial benefits such as independence from urban employment, it is likely that the African farmer will continue with cocoa cultivation in the face of current prices. The cut-off level, where cocoa is abandoned, is unknown.

Present low prices will certainly inhibit the planting of cocoa, in Africa as well as in the rest of the world. There is no incentive to attempt to restore the fortunes of the Bahian cocoa production in Brazil through control measures or through breeding resistance and we can expect a continued decline in output here. Malaysian production is now focused on smallholders, albeit larger owners than their African counterparts. Continued struggles with disease raise the costs here and output will not increase.

In Indonesia, further expansion is likely as earlier plantings reach full maturity, but large areas of production are increasingly threatened by pests and diseases such as the cocoa pod borer.

With no signs of significant growth in the minor producers, it is likely that production will become increasingly polarised in West Africa in the next few years. This must lead to greater instability in global supply as the impact of climatic fluctuations cannot be mitigated by the smaller producers outside West Africa. If so, then price volatility should increase, but the market is now much different, being highly consolidated in the hands of few players, and it is not clear how the few remaining players will behave.

The balance of power seems to rest increasingly in the hands of the few cocoa processing companies that control the trade in beans and products. Their purchasing power has become an important factor in determining the condition of the market. Conversely, there appears to be a move by the confectionery manufacturers towards buying in products to assemble into branded goods, rather than manufacturing chocolate. The importance of the cocoa processors in the cocoa market should not, therefore, be underestimated, and it is notable that, among the three largest, only one, Barry Callebaut, has a significant history of involvement through out the cocoa trade.

On the consumption side, we can expect further growth as economic and demographic expansion combine to increase demand. In due course, the low prices will also impact on consumption, adding to the growth, and, with limited growth potential in production, the market seems likely to move into a more definite deficit in the next few years.
### Table I World Cocoa Balance

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<th>World Crop (Net)</th>
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*Units: '000 Tonnes*

Source: ED & F Man Cocoa Ltd
### Table II World Cocoa Production

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Source: ED & F Man Cocoa Ltd

### Table III % Share of World Cocoa Production

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**World Grindings of Cocoa Beans**

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*Source: ED & F Man Cocoa Ltd*