

## Summary

### *Price formation on the futures market and the physical market for cocoa*

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## 1. Definitions

Term	Definition
Spot price	The current market price, or spot price, is determined on the spot market. The traded raw materials are delivered within two business days and payment is made with immediate effect. In this study, the spot price is the price at which raw cocoa can be delivered on the futures contract maturity date. This price is composed of the futures price at maturity and the country differentials. The Living Income Differential (LID) of USD 400 is also added to the spot price as of the 2020/2021 sales season.
Futures contract and futures market price	A futures contract is an agreement on the purchase or sale of a standardised quantity at a pre-determined price (futures market price) and at specified time in the future.
Open position	An open position arises where a futures contract is entered into by two market players. If a futures contract is purchased by one market player and sold to another, the number of open positions increases. An open position can be held until the relevant contract reaches maturity. A market player can, however, close out their open position before maturity by taking an equivalent opposite position. By offsetting the position before expiration of the contract, market players can avoid actually having to deliver or accept the raw cocoa. This mechanism is used to generate profits through price differences over time.
Volume	Volume refers to the total amount of transactions made on a particular day. This number includes both opening and closing of open positions. Volume therefore also records transactions made by speculators, who buy and sell a contract within just a few minutes in order to make profits through price differences.
Exogenous pricing	Pricing based exclusively on fundamental values, i.e. information pertaining to the relationship between supply and demand. The best forecast for the next-day price consists of the price of the previous day and a random “shock”; price changes are therefore random and not predictable. This is how prices are formed according to the Efficient Market Hypothesis (EMH).
Endogenous pricing	Pricing is influenced by the dynamics of other profit-oriented market players. Prices are influenced endogenously, for example, if market players try to identify patterns based on previous price changes, which they then use as the basis for future transaction decisions. This contradicts the assumptions of EMH.
Country/origin differential	Quality-differentiated premiums according to the country of origin charged on top of the futures price at maturity. These premiums are brokered between international raw cocoa buyers and the respective institutions in exporting countries. The country differential for Ghana, for example, is consistently high thanks to the high regard for the quality controls carried out by COCOBOD.
Living Income Differential (LID)	Surcharge of USD 400 per tonne of cocoa beans on top of the “Free on Board” price (FoB) introduced for the 2020/2021 cocoa season in Côte d’Ivoire and Ghana with the aim of increasing the producer price. The LID policy also stipulates that, once the export price (incl. country differential and LID) exceeds USD 2,900, any surplus will be placed into a stabilisation fund that, in turn, can be used to guarantee a minimum price of USD 2,600 if the export price (incl. country differential and LID) falls below USD 2,600. In doing so, the policy seeks to ensure that farmers always receive a producer price of 70% of the minimum export price of USD 2,600 per tonne.
Programme of Anticipated Sales (PVAM)	The heavily regulated Ivorian marketing system guarantees a minimum price and removes seasonal price risks for producers. As part of the Programme of Anticipated Sales (French: <i>Programme de Ventes Anticipées à la Moyenne</i> ), 70 to 80% of the next year’s crop is sold to exporters via futures auctions six months before the new crop year. The resulting average futures price is then used together with forecasts on remaining spot sales and exchange rates to determine a reference price for the next year. This reference price is defined as the CIF price (cost, insurance and freight) and is used as the basis for calculating remuneration for all actors within the national cocoa value chain.

## 2. Study background and objectives

- The pricing process on both the futures market and physical market for cocoa is considered to be non-transparent and, at times, inefficient. However, available data is outdated and leads to inconclusive results.
- In addition, it is unclear how the increased transaction volume of profit-oriented speculators (i.e. actors that unintentionally act to cover themselves against price risks in relation to the baseline value, in this case cocoa) impacts futures prices and the efficiency of pricing.
- The objective of the study is to investigate the factors for determining cocoa futures prices on the London futures exchange (Part A) and raw cocoa prices on the physical market in Côte d'Ivoire (Part B).
  - Part A focusses on exploring the function of futures markets for market players in hedging against price risks by reviewing pricing efficiency.
  - In part B, the focus is on investigating the living and working conditions of cocoa farmers, as well as the marketing structures and pricing on the physical cocoa market in Côte d'Ivoire. This includes institutional analyses and evaluation of collected representative household data on agricultural and socioeconomic indicators. The authors also analyse the relationship between the physical cocoa price in Côte d'Ivoire and the futures market price on the London Stock Exchange.
- The results are intended for use as part of the evidence-based policy consultation for the Federal Ministry of Food and Agriculture (BMEL) which, in 2019, together with the German Federal Ministry for Economic Cooperation and Development (BMZ), adopted a 10-point plan for a sustainable cocoa sector with a focus on fair prices and appropriate incomes for cocoa farmers.

## 3. Part A: Pricing on the futures market

### 3.1 Use of the futures market for hedging against price risks

- Traders and processors use futures markets to hedge against unexpected price shocks and create planning security in relation to buy/sell prices.
- This is particularly necessary as uncertainty with regard to weather, crop yields and global supply and demand inevitably leads to increased volatility on agricultural raw material markets, which poses a challenge for traders and processors.
- However, the question remains as to whether this inherent price volatility, arising as a result of exogenous, fundamental shocks, is also consequently reflected in the futures market prices. Due to the increased interest of speculators in agricultural futures contracts, price volatility can also be generated through other factors that do not reflect the fundamental, exogenous information. Day-to-day volatility could potentially be amplified and pricing on the futures market could be influenced and/or distorted.
- If the futures market price is formed based on fundamental values, the futures price is an undistorted estimation of the raw material price at maturity of the futures contract. Only in this way is the futures market suitable for hedging against price risks.

### 3.2 Efficient Market Hypothesis (EMH)

- All risk-free profit opportunities (e.g. arbitrage) have been exploited and **price changes only occur based on new information** (with regard to the fundamental relationship between supply and demand) ▶ **only exogenous shocks and new developments determine price changes**.
- According to the EMH, the cocoa futures price reflects all publicly available, price-related information, meaning no market player can beat the market in the long term – without luck or insider information, at least.
- However, to be efficient, markets require **rationality** and **risk-neutrality**. The increasing involvement of profit-oriented speculators in commodities futures markets with no interest in the

baseline value (here: cocoa), therefore, in and of itself invites questions about the efficient pricing and the EMH.

- **Approach to testing the EMH and efficient pricing on the cocoa futures market as part of the study:** the authors examine four arbitrage possibilities which, in theory, only remain available until an efficient price is reached. Where all arbitrage possibilities are exhausted, price changes are based solely on new information/shocks and pricing is efficient. This study sought to ascertain whether the four arbitrage possibilities are exhausted:
  1. Difference between spot price and futures market price before contract maturity (spatial arbitrage) ▶ spot price and futures price must converge upon maturity of the futures contract (see [chapter 3.3.2](#)).
  2. Fundamental information is already priced in (see [chapter 3.3.3](#)). Day-to-day price forecasts cannot be made using fundamental information.
  3. Same prices for a homogenous commodity at various trade centres/stock exchanges, here: London and New York (*law of one price*, see [chapter 3.3.4](#)).
  4. Successive price changes are independent, i.e. random (see [chapter 3.3.5](#)).

### 3.3 Results

#### 3.3.1 Market players

Market players that hold more than 100 open positions are obligated to provide information on the purposes of their trades. This information is published once a week (as part of the *Commitments of Traders* report). Information on commercial and non-commercial traders is reported separately here so that it can be used to make statements on the speculative activities on commodity futures exchanges.

- Processors and traders dominate the market throughout every year of the study period from 2011 to 2021:
  - Approximately half of the buying market players and half of the amount of open long positions in 2021 can be associated with raw cocoa buyers.
- There is a correlation between the number of market players with open long positions and the weekly futures prices. The number of buying traders drastically declined from September 2016 with a simultaneous reduction in futures prices. However, the number of buying traders and prices both bounced back by 2020.

#### *Prevalence and impact of speculation on the commodity futures exchange*

- Furthermore, it is primarily **changes in open positions** that determine prices:
  - In 2019, the change in the open long positions of **speculators** was, on average, as large as that of processors and traders, **which is an indication of their increased influence on pricing**.
- **Speculators respond (with change to open positions) more severely to price changes for the previous week** and this can lead to new developments in relation to the supply and demand of raw cocoa **driving prices up or down disproportionately** ( ▶ this increases volatility).
- **Daily volume of purchases and sales also have a significant impact on the day-to-day volatility of cocoa prices.** The **daily volume** from March 2021 to December 2021 was on average **7.6 times as high** as the change in the daily open positions. This indicates the **presence of speculators** in the market who buy and sell a contract within just a few minutes in order to make a profit on the differences in price.
- A **low financial transaction tax** of 0.02% could help to reduce the daily volume by minimising the activity of daily speculators and stabilising the day-to-day price volatility. However, the long-term effect of this is unclear as any interference in the financial market starts a dynamic process of adjustment.
- In general, a futures market must be sufficiently liquid (i.e. have enough volume) to absorb large transactions without causing major price fluctuations.

- Driving away too many speculative traders from the futures market could lead to those interested in raw cocoa not having enough opposing contracting parties to complete any transactions on the financial market (hedging against price risks would no longer be possible).

### 3.3.2 Relationship between futures market and spot market

- All risk-free opportunities for profits are exhausted once the spot market price converges with the futures market price upon expiration of the contract.
- On the cocoa market, the difference between the spot price and the futures price at maturity only corresponds to the relevant country differential and the LID (from the 2020/2021 season).
- The study therefore looked at the **relationship between futures prices two months before maturity and the futures prices at maturity** between 2000 and 2021. This relationship has **long-term efficient pricing**: both markets follow the same data process.
- The authors also explore **when** prices are set in the futures market.
  - There are **five maturity dates** throughout the year in **March, May, July, September and December**, each falling between the 12th and 17th of the respective month. The **point at which the futures price is set** has been **two months before maturity** since 2016. This approximately corresponds to the maturity date of the previous futures contract. ▶ This suggests that the market players operating on the futures market after maturity (and therefore two months before the next due contract) influence the prices. A contract expires (e.g. in May) and the trader subsequently focusses their activity on the next contract due (July).
- The spot prices are available from July 2015 up to and including December 2021. Futures pricing six months in advance and the spot prices of the four main producing countries at contract maturity show that all four spot price time series are subject to efficient pricing.
- Spot prices for Ghana and Côte d'Ivoire show a long-term, stable balance with futures prices. The futures price is in line with the spot price for all four spot price time series. Prices are therefore set in the spot market and determine the price trend.

### 3.3.3 Price trends and changes in price trends

- July 2016 onwards saw a change in the trend: futures prices at maturity are lower than futures prices two months prior. This benefits short positions in particular (sellers of futures contracts) if these close out their open positions by taking an equivalent opposite position before maturity, i.e. buying a now lower-priced futures contract.
- **Seasonality** leads to **natural price changes** throughout the year: in June and July, prior to the main harvest, prices are on average at their most volatile as the amount of expected crop is announced at this time. Prices usually reach their lowest in December before maturity with a second low point following in May.

*The data also shows other patterns in the price trends beyond seasonality:*

- The relationship between the **supply and demand** of raw cocoa dictates **longer trends** that can last three to five years.
- **Despite daily volatility** (primarily caused by daily speculation), **prices always return to their original long-term trend**.
- **Contract maturity dates** provoke further small **changes in trends** every two to three months (due to the above-average changes in the open positions around these maturity dates), which last until the next maturity date (cf. pricing date two months prior to maturity).
- Figure 1: **Nine main trends** have been identified since 2000.
  - **In 2016**, a record harvest in Côte d'Ivoire resulted in an **excess supply of cocoa**, causing the price to plummet. The price slowly increased in 2018 due to a comparably low harvest in March and the following months.

- On average, the value of cocoa increased between 2008 and 2020.



Figure 1: Impact of long-term trends, volatility between maturity dates and seasonality on futures prices

- Analysis of the price trends **also provides evidence of efficient pricing**: these trends are based on fundamental information pertaining to the supply and demand of the underlying raw material of cocoa at contract maturity.
- The order of the ten simultaneously traded cocoa contracts with different durations contains information on how the futures price for the next contract due will behave up until maturity. Supply and demand and maintenance costs are reflected in the prices.
- The country differentials are determined six months before maturity for the forward price, but pricing begins before that. The progression of the country differentials over the two months before prices are set also provides an indication of how high the demand for raw cocoa is and how high the supply (harvest) is estimated to be in the time period, particularly in the approx. six to eight months before contract maturity and delivery of the raw cocoa.

#### *Fundamental arbitrage:*

- Pricing on the futures market should be determined upon contract expiration based on the expectations of the market players with regard to fundamental information, such as supply and demand of the raw material in question.
- The authors determine fundamental predictors such as weather data, but also stock exchange-based price determinants for day-to-day cocoa futures prices.
- Cocoa news sentiments are indicators of the market's overall sentiment in relation to publicly accessible financial and agricultural news. This is now indirectly integrated into the daily prices.
- The results from the multivariate forecasts suggest that all price determinants are indirectly integrated into the price of cocoa and are not conducive to day-to-day price forecasts and changes in price directions. All risk-free profit opportunities have therefore already been used.

#### **3.3.4 Price differences between stock exchanges in London and New York**

- To ensure that risk-free profits are no longer possible for simultaneous trading on both agricultural futures exchanges, the futures prices for homogenous cocoa must be equal at the ICE in both London and New York where these are stated in the same currency.
- However, if low-quality raw cocoa (among other things) from Latin America is sold on the American market whereby a **natural price difference at both exchanges** arises, the prices on the ICE in New York are normally lower (up to USD 160), but this price relationship does go the other way from September 2017.
  - The expected availability of raw cocoa in London has increased, causing the prices to fall in comparison to those in New York. Raw cocoa from West Africa is also traded at a higher price than in London (according to the ICCO).
- Negative correlation between **exchange rates and cocoa futures prices**: If GBP depreciates in value in comparison to USD, cocoa futures prices increase in London and decrease in New York.
- Over time, both time series continuously adapt to one another and do not drift apart; there is also a high degree of correlation between the volatility of cocoa prices on both exchanges.

### 3.3.5 Independence of successive price changes

- The Efficient Market Hypothesis postulates that **successive price changes** are **independent of each other** on efficient markets. The best forecast for the next-day price consists of the price of the previous day and a random “shock”. Between them, prices are therefore largely dependent on one another **but any price changes are random**. The EMH therefore hypothesises that no long-lasting profitable forecasts can be made based on previous price changes as future price changes are independent of these and random.
  - In contrast, in the case of **endogenously generated price trends**, market players make transaction decisions based on the assumption that price patterns tend to repeat themselves in the future.
  - The authors develop a forecasting model and show that future changes in price direction can be predicted with a certain level of probability ( $\approx 60\%$ ) based on past price patterns.
  - Other agricultural futures prices, and even share prices, are examples of the same endogenously generated data process.
- ▶ Contrary to the EMH, **daily prices are endogenously generated to a certain extent** which is an indication of increased algorithmic market player transactions. However, these **daily changes in price direction do not disrupt the long-term price trends based on fundamental information**.

### 3.4 Key takeaways

- **No evidence against the fundamental efficiency of the cocoa futures market can be found in the data for the study period** – even though certain endogenous dynamics can be identified. All available information is indirectly priced in and price trends are determined by exogenous shocks and new developments with regard to the supply and demand of cocoa.
  - The futures market is therefore suitable for hedging against price risks as the futures price is reflective of a largely undistorted forecast of the future raw material price at maturity.
- The authors find evidence of the increased influence of speculation on pricing (e.g. the increased daily transaction volume, among other things) and algorithm-based securities trading also appears to have increased. This development should be monitored closely as it could lead to potential market distortion and inefficiencies.
  - **Speculation threatens to intensify abrupt changes in fundamental data** as speculative market players base their transaction decisions disproportionately on past price changes.
  - **Speculation amplifies daily volatility**, but it is fundamental data that determines long-term price trends.
  - **A transaction tax** could curb the involvement of short-term speculators and help to stabilise prices, but the long-term effects of this are uncertain.
- Traders and processors (i.e. actors that use the futures market to hedge against price risks) still hold the most open positions. The number of traders dropped drastically from September 2016. Fewer large traders had a larger influence on price developments. The number of market players then rose again. There is simultaneously a positive correlation between the number of buyers and the futures prices.
- *Efficient* does not mean *fair*. Due to a lack of alternatives for income, cocoa farmers do not walk away from cocoa farming despite the low cocoa prices, which would lead to a decline in the cocoa supply and, in turn, an increase in prices. In fact, farmers still consider cocoa to be an attractive crop (see [Part B](#)). The world market price is therefore “subsidised” by the lack of economic development in rural Côte d’Ivoire and the dependency of its farmers on cocoa.

## 4. Part B: Pricing and marketing structures on the physical cocoa markets using the example of Côte d'Ivoire

### 4.1 Starting point

- A large portion of available studies look at the cocoa value chain and pricing in liberalised markets. There is almost no literature on the regulated cocoa market system in Côte d'Ivoire. Literature on the work of the *Conseil du Café-Cacao* (CCC) is also scarce. Existing literature focusses mainly on the time before the CCC was created.
- Overall, there are only a few empirical studies that investigate the determinants of farmgate prices.
- Cocoa continues to be a popular crop and a switchover from cocoa farming to other plantations seems unlikely in the short term.
- Improving the living standards of cocoa farmers remains the most important challenge in the cocoa sector. As a new widescale measure to resolve this issue, Ghana and Côte d'Ivoire introduced the so-called "Living Income Differential" (LID) for the 2020/21 cocoa season, but there are still **no empirical analyses on the effectiveness of the LID** available.

### 4.2 Methods and material

- Institutional analysis of the national cocoa market and collection of representative primary data in Côte d'Ivoire in **August and September 2021** ( $\cong$  end of the 2020/21 cocoa season).
  - The statistical territory covers Côte d'Ivoire's entire cocoa belt, making up half of the country's land surface.
  - Extensive surveys on agriculture and socioeconomic information.
  - Both cocoa farmers and non-cocoa farmers were surveyed.
  - The questions relate to 2020 or the 2020/21 season that was still ongoing at the time of the survey.
  - Final sampling:
    - **1,052 full interviews** with agricultural households, **972 ( $\cong$  92%) of which were cocoa farmers** and **80 ( $\cong$  8%) of which other agriculture households.**
- Descriptive and econometric (primarily OLS regressions) analysis of determinants for physical cocoa prices and the living conditions of (cocoa) farmers in Côte d'Ivoire.

### 4.3 Results

#### 4.3.1 Socioeconomic characteristics of agriculture households

- Production and sale of cocoa is the **primary activity and main source of income** of cocoa farmers, non-cocoa farmers often grow the *cash crop rubber*.
- **Average household size** of cocoa farmers: **6.8 persons per household**.
- **Isolation:**
  - On average, cocoa farmers included in the sampling live in very secluded areas (average of 19 km to the next tarmacked road).
  - 25% report a poor **telephone network**.
  - 19% of cocoa farmers have no access to **electricity**.
- **Gender:** only **5% of householders are women**.
- **Cocoa farmers are more commonly (im)migrants than is the case for non-cocoa farmers**, 17% of those surveyed come from Burkina Faso.
- **Low level of education:** 48% of surveyed cocoa farmers have had no formal education.

#### 4.3.2 Household agriculture activities

- **Land ownership:** **68%** of cocoa farmers are **owners** of the land that they cultivate.
- **Average acreage** of cocoa farmers: **7.84 ha, around 60% of which is used for growing cocoa**
- **Diversification:**



- Cocoa farmers grow on average 3.67 different crops.
- However, the income of just over 50% of cocoa farmers comes exclusively from the sale of cocoa.
- **No statistically significant difference** between cocoa farmers and non-cocoa farmers can be identified with regard to the **extent of diversification** using an **OLS regression**.
  - Other findings from the OLS regression:
    - **Native farmers** demonstrate a significantly higher level of diversification than (im)migrants.
    - The larger the acreage, the larger the extent of diversification.
- **Overall, the level of diversification is low.**
- In 2020, **75%** of cocoa farmers purchased and used **agricultural inputs** such as insecticides, herbicides and fertilisers, while only **13%** received inputs from the **CCC**.
- **31%** of cocoa farmers are at least partially **certified**.

### 4.3.3 A typology of cocoa farmers

- **Objective:** to investigate the extent to which conditions for different well-resourced cocoa-farmer households vary and how this impacts the livelihood of these households. These “farmer profiles” can be used to tailor interventions and policy measures more efficiently and effectively.
 

**Approach:** The sampling of cocoa farmers is divided into five clusters (quintiles) alongside four variables describing the level of available resources to allow the authors to examine the differences between the groups with regard to welfare indicators. These four variables include:

  - Area of land used to grow cocoa
  - Expenses for operating materials
  - Number of *cash crops* grown
  - Income from agriculture
- Cocoa farmers are very similar to one another in these four variables within the groups, but there are differences between the groups. The lowest quintile thus represents cocoa farmers with low areas of land used to grow cocoa, low expenses for operating materials, low income from agriculture and low number of different *cash crops* in comparison to the average. Conversely, the highest quintile represents cocoa-farmer households that have extremely high values in all four variables.

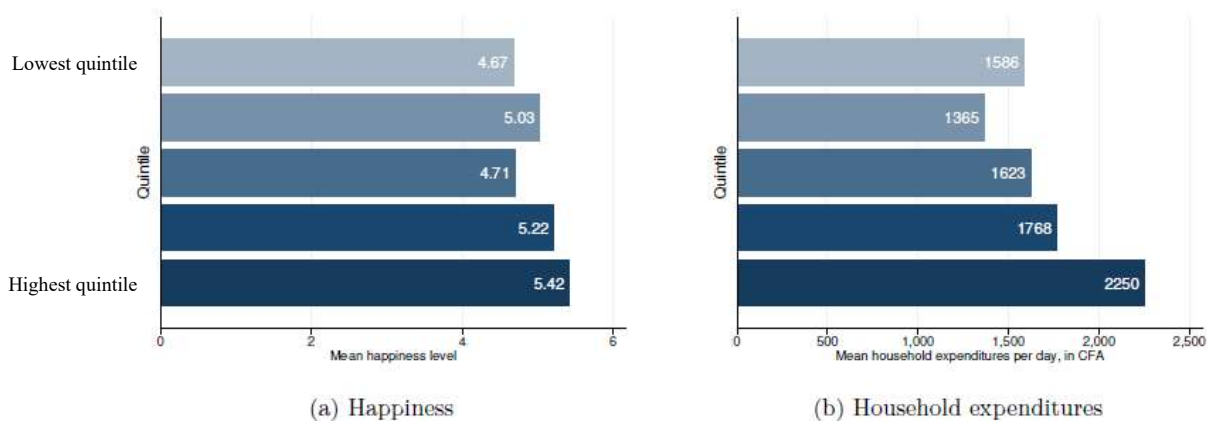


Figure 2: Mean happiness level and mean household expenditures in the five different groups

- ▶ The “welfare” (measured using four indicators: happiness index, average daily household expenditure, number of household members that have migrated from the household in the past and whether or not the farmer household has expanded acreage in the two years prior to the survey) of cocoa farmers varies depending on the available resources.
- ▶ Both the average level of happiness and the daily household expenditure are at their highest in the highest quintile, i.e. in the most well-resourced group of cocoa farmers. However, the average

household expenditure is still on the lower end of the scale, **which suggests that the level of income for the sampling of farmers is generally low.**

#### 4.3.4 Cocoa marketing

##### 4.3.4.1 Relationship between farmer and buyer

- On average, cocoa farmers sold **6.4 tonnes of cocoa** during the **main harvest** from October 2020 to March 2021 and a further **0.8 tonnes** during the **secondary harvest** from March to September 2021.
- On average, **10 buyers** visited the respective village of the farmer surveyed **during the main harvest** to buy cocoa. This indicates that there is a very large supply of potential customers.
- Around 86% of cocoa farmers sell their cocoa to one sole customer.
- 90% of the cocoa farmers surveyed believe that their main customer pays the same price as they do to other cocoa farmers which implies that, in general, cocoa farmers are satisfied with their customers and **trust them with regard to pricing.**
- **One third** of cocoa farmers believe that the **current farmgate price is too low.**

##### 4.3.4.2 Local fluctuations in cocoa prices

- The marketing of cocoa in Côte d'Ivoire is heavily regulated and guarantees a **fixed farmgate price**. During the main 2020/21 season, the farmgate price was **FCFA 1,000/kg** ( $\approx$  approx. EUR 1.5/kg). This had to be lowered to FCFA 750/kg during the off-season.
- Despite this, the survey results show a **certain lack of uniformity in relation to the price that cocoa farmers received for cocoa in the 2020/2021 harvest season according to their own data**: on average, farmers report a farmgate price of **FCFA 922/kg** during the main harvest and **FCFA 637/kg** during the secondary harvest.
- The districts of **Comoé** and **Sassandra-Marahoué** show the highest positive deviations from the set farmgate price; **Worouba** and **Zanzan** have the highest negative deviations.
  - **Transport costs** could play a role here: the northern districts are further away from the ports and the road network is sparse. As the remuneration that customers must pay farmers for raw cocoa is also set by the CCC as a flat rate (see chapter 4.3.4.4), increased transport costs combined with a weaker bargaining position for farmers can put pressure on prices.
- **OLS regression to identify determinants for price differences**:
  - Only the variable that indicates whether or not the cocoa farmer is certified has a significant influence on the producer price. Certification is linked with a markup of FCFA 21/kg on the producer price.
  - The price differences between the various districts are not statistically significant.
- ▶ The statistical inaccuracies for the remaining estimates suggest that regulation of the Ivorian cocoa market actually does **very little to restrict the leeway for negotiations** and the bargaining power of wholesale buyers.

##### 4.3.4.3 Living Income Differential (LID)

- A **guaranteed producer price** of FCFA 1,000/kg **incl. FCFA 229/kg LID**, was set for **2020/21**.
- **Awareness of the LID** among the surveyed cocoa farmers lies **below 50%** in all surveyed districts and regions.
  - **OLS regression to identify factors influencing awareness of LID**:
    - **Certification**;
    - **Membership of a cooperative**; and
    - **Telephone or radio as main source of information about agricultural markets** all significantly increase the probability that the LID is known by the surveyed cocoa farmer.
- **Effectiveness of the LID** with regard to **increasing/stabilising prices**:
  - **70%** of cocoa farmers that are aware of the LID state that the **LID helps to reduce price volatility.**

- However, fewer than 25% of those that are familiar with the LID believe that they receive the full LID.
  - In fact, conversely, international buyers have negotiated down the country differential, which has impacted the prices that they effectively pay accordingly.
- The **true, inflation-adjusted producer price** for **2019/20**, **2020/21** and **2021/22** was **FCFA 810, 900** and **750/kg** respectively. In absolute figures, the producer price was therefore higher in the first year with LID than in the previous season, even though the difference is less than FCFA 229. This corresponds to an LID of USD 400 per tonne. However, the producer price fell below the level prior to the introduction of the LID in the 2021/22 season, i.e. the second year with LID.

#### 4.3.4.4 Value added along the local cocoa value chain

- A *Barème* (scale) is used to define how the guaranteed CIF price determined by the CCC based on the *Programme of Anticipated Sales* (PVAM) is distributed across the different actors in the Ivorian value chain.

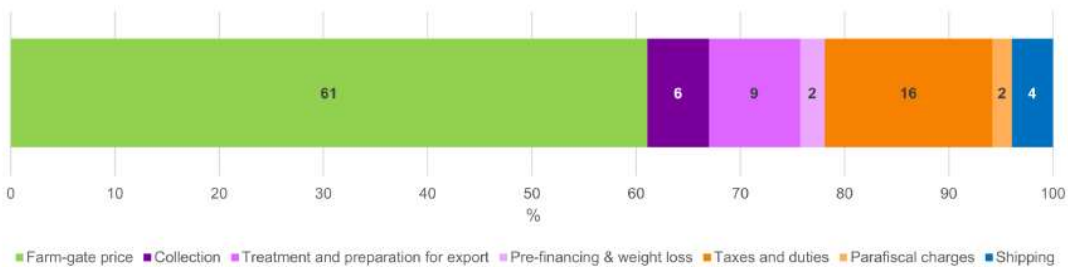


Figure 3: Remuneration (as a percentage of the guaranteed CIF price) along the cocoa value chain in Côte d'Ivoire for the 2019/20 season

- The **producer price made up between 60 and 61% of the guaranteed CIF price** in all seasons from 2012/13 to 2021/22, **except in the 2020/21 main season.**
- The producer price started out as a high percentage of the CIF price in the 2020/21 main season but this could not be sustained and had to be reduced in the off-season.
- Cocoa farming is the country's most heavily taxed income-generating activity (**18% of the guaranteed CIF price goes to taxes and (parafiscal) levies**). The cocoa sector is responsible for over 10% of the nation's total tax revenue.
- **Comparison of the guaranteed CIF price with the prices on the London futures exchange:**
  - The authors show that the CCC's guaranteed CIF price determined using the PVAM mechanism was **systematically below the prices on the London futures exchange, incl. the country differential**. On average, in the seasons from 2015/16 to 2020/21, the **guaranteed CIF price amounted to just 92% of the average price for cocoa futures** six months before the new crop year (the same point in time at which the guaranteed CIF price is determined) incl. the country differential.
  - Potential reasons for this could be that the sales are not well planned or negotiated, or that export licences are issued to influential actors in the country at prices below the market price.
  - If the guaranteed CIF price was in line with the world market price in the analysed 2019/20 season, the farmgate price could have been increased **by 16%**.
- The authors suggest various reasons for the poor living conditions of many cocoa farmers: the high taxation and the guaranteed CIF price below the world market price (incl. country differential) mean that, among other things, **Ivorian cocoa farmers receive the lowest cocoa producer price in the world.**

#### 4.3.4.5 Transmission of world market price volatility to the home market price

- The authors also estimate the price transmission elasticities which indicate **to what extent the fluctuations in the world market price are transmitted to the home market price.**

- In the case of Côte d'Ivoire, **transmission elasticity is at 1.03 for the period of 1991-2019** meaning that **fluctuations in the world market price are completely translated into the home market price**.
- This result highlights the central role that the world market price plays in home market price fluctuations.
- With the LID policy, in particular the attempt to maintain the export price between USD 2,600 and 2,900 per tonne (if the export price incl. LID exceeds 2,900, any surplus is directed into a stabilisation fund in order to ensure the minimum price of 2,600 at times of low prices), the Ivorian government seeks to combat this fact and cut ties between domestic actors and the volatility of the world market price.
- However, the authors conclude that **political measures that attempt to unlink domestic prices from the world market prices are likely not sustainable**, at least when there is no long-term public funding.

#### 4.4 Key takeaways

- Despite the low producer price, cocoa remains an attractive crop to grow in Côte d'Ivoire with acreage tending to expand.
  - Dependency on cocoa is high and the level of diversification is low.
  - Measures to limit quantities cultivated alongside the LID would therefore require clear compensation mechanisms for cocoa farmers.
- The uneven distribution of resources has a noticeable impact on the living conditions of cocoa farmers.
  - Public and private business actors should extend targeted measures for vulnerable households.
- The CCC's price regulation appears to actually leave less room for price negotiations. However, the effective producer price in the surveyed year of reference was below the guaranteed producer price.
  - A minimum price of FCFA 1,000/kg was set for the main harvest of the 2020/21 season; on average farmers only received FCFA 922. Prices received by farmers in the off-season also fell short of the guaranteed producer price of FCFA 750 (on average FCFA 637).
  - Certification provides leverage for marking up prices.
- Awareness of the LID is so far < 50% in all surveyed districts and regions.
- The effectiveness of the LID: The true producer price for the second season even fell below that of the season prior to introduction of the LID.
  - This is, in part, due to the Covid-19 pandemic causing demand for cocoa, and thus the world market price, to fall.
  - International buyers also negotiated down the country differential.
- Fluctuations in the world market prices are fully transmitted into the domestic cocoa prices in Côte d'Ivoire at a ratio of 1:1.
  - The LID policy is intended to protect domestic cocoa prices against any developments on the world market in the long term through the use of the stabilisation fund linked to the LID. However, the authors are sceptical that this will be successful in the long term.
- The problem of the low producer prices is further amplified by potential inefficiencies in the PVAM, according to which Côte d'Ivoire sells 70 to 80% of its crops six months before the new crop season. The resulting "guaranteed CIF price", which is taken as the basis for the producer price, was systematically below the world market price in the last five years (at just approx. 92% of the futures market price incl. country premium).
  - If this inefficiency was rectified, producer prices could have been increased by 16% (e.g. for the 2019/20 season).