

Pricing mechanisms in the cocoa sector: options to reduce price volatility and promote farmer value capture

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Contents

Executive Summary	4
Introduction	6
1. Sector-led models	8
2. Supply chain-led models: company models	12
3. Supply chain-led models: the case of Fairtrade	15
4. Producer-led models: physical and hedging strategies	18
5. Conclusions and recommendations	24
6. How to move towards improved price and supply management?	31
Appendix I: Overview of price management mechanisms	36
Appendix II: Guidance on selecting price management mechanisms	39

Executive Summary

Price volatility is a common challenge facing smallholder farmers in tropical commodities. A 40% drop in the price of cocoa in West Africa in late 2016 has highlighted how price volatility and extended periods of low prices can undermine the income gains from successful supply chain programs that have catalyzed investment in farmers. It creates significant barriers for farmers to invest in productivity, quality and sustainability and reach a living income. To help inform a productive discussion on price management mechanisms as part of the sector improvement toolkit, this paper provides an overview of price mechanisms currently in use in cocoa.

At the sector level, the governments of Ghana and Ivory Coast have introduced different mechanisms. Fixed seasonal farm gate prices seem to give some modest price improvement to farmers along with improved stability and protection from traders and improved transparency. The price stabilization funds used by both countries were often sufficient to buffer against international price volatility during the year, but not across the years as illustrated in the 2017 price drop. A lesson learned from these models (as well as from other commodities) is that farm gate price management can have an impact on supply as the high cocoa farm gate prices in 2015/2016 are thought to have stimulated the high production levels in 2017. As prices in commodities with limited storage capacity are highly sensitive to oversupply (in the US dairy sector, it estimated that a 2% oversupply can lead to a 20% reduction in price), they have to be managed in the context of supply and demand. Furthermore, sector-led models need transparency and accountability in decision-making for long-term sustainability.

In addition to full public sector price-setting and supply management, many other lighter mechanisms exist that have the potential to reduce volatility and improve farmer returns, including market information systems, quality standards, agribusiness finance, trade licenses, producer group strengthening and extension services on quality management, crop diversification and farm business management.

Potential price management mechanisms in the cocoa sector that warrant further investigation

Sector-led

Applicable to governments or sector governance bodies

- Promote transparency and accountability of sector led models by possibly introducing more multi-stakeholder-driven and international governance
- Introduce supply management along with price management at sector-level (e.g. land zoning, diversification, buffer stock management)
- Introduce complementary measures (e.g. market information systems, quality standards, trade licenses, extension services, market promotion)

Supply chain-led

Applicable to buyers from first buyer to retail

- Promote minimum prices in mainstream markets
- Promote cost-plus pricing or flexible premiums in combination with traceable supply chains, contract farming and direct payments between end users and producers
- Offer favorable trading terms such as pre-finance, quick payments, long-term trading arrangements
- Consider pre-competitive modelling and distribution of price differentials

Producer-led

Applicable to individual farmers and producer organizations

- Promote physical and hedging strategies through producer organizations
- Promote crop diversification

There is also a great deal of innovation in supply chain models in cocoa to promote more sustainable production and better returns. This paper also looked at models where companies top up market prices with premiums while others decouple from market prices altogether. Some of these companies offer complementary, favorable trading terms such as pre-finance, quick payments, long-term supply deals and hedging opportunities. These models, mostly applied in fine flavor markets, have successfully brought higher returns and stability to cocoa farmers. This paper also identified some challenges in terms of scalability in bulk markets, including issues of competitiveness and the unintentional stimulation of supply. Nonetheless, some of the mechanisms such as minimum prices, flexible premiums and cost-plus pricing could be applicable in mainstream markets such as when applied in contract farming arrangements.

Supply chain models can also be developed on a pre-competitive basis. This paper looked at two key components of Fairtrade's pricing model: a Minimum Price and a fixed Premium. While pre-competitive models have several challenges in implementation, they can contribute to a level playing field and allow for strategic investments at wider scale.

Producer organizations can also apply physical and hedging strategies to manage price risk. This paper discusses how physical activities such as procurement and sales can be a clear and effective way for cocoa producer organizations to manage price risk, but that their execution requires leadership, competences, and accountability by producer organizations. At the production-level, producer organizations can also promote crop diversification among their members to make them more resilient to the volatility of one crop. Futures trading, for its part, allows for strong margin protection but involves costs and management capacities that may be beyond the reach of most cocoa producer organizations. The ability of cocoa producers to benefit from hedging, including price insurance, is largely conditional on support from buyers such financial services and risk-sharing arrangements. All-in-all, hedging strategies can be an important tool for cocoa producer organizations even in the fixed price environment of Ivory Coast (i.e. exporting cooperatives).

This paper ends with recommendations on when and how to engage in a discussion on price management and what role different actors could play. It describes certain factors such as high volatility, extended periods of extreme low prices and delays in supply response increase the urgency to introduce price and supply management. The choice for a mechanism should depend on the nature of the problem, its scale and contextual factors. The success of the price management mechanisms will depend on many factors, including the viability of prevailing production systems, the organization level of producers around markets and professional service delivery as well as the political, technical and financial capabilities to manage the mechanisms. Price and supply management should neither be an isolated strategy nor a goal in itself, but part of a sector transformation strategy with many complementary measures.

In terms of roles, companies can look at their own supply chains, invest in traceability and promote more favourable trading relationships with their suppliers. Governments can work on a range of strategies including quality standards, price transparency, price-fixing, buffer stock management and supply management. Pre-competitive initiatives and particularly voluntary standards could pay more attention to supply chain dynamics and promote fairer trading relationships, including minimum prices or flexible premium models. They will also need to balance the supply and demand ratio for certified products to ensure farmers receive the full market benefits. They could promote more stable supply chains and emphasize crop diversification in their standards. Development actors could support producers in crop diversification and value addition. Together with civil society and multi-stakeholder platforms, they also have an important role to play in initiating and guiding the dialogue on price and supply management.

Introduction

Price volatility undermines agriculture and value chains

The last two decades have seen an increasing emphasis on company and supply chain-driven approaches to promote sustainable production and trade of agricultural commodities. These initiatives have sometimes achieved remarkable success with benefits to both farmers and commercial partners within that specific project area. However, supply chain based approaches risk creating “islands of success” which are not self-sustaining and do not benefit the wider sector. Additionally, the successes of these individual supply chain projects can be limited if wider sector weakness exist (price volatility, diminishing value capture by producers, free riding, etc.). There is an increasing awareness that to reach scale and sustainability, value chains need to be part of more inclusive and stable sectors.

Price volatility is common challenge facing smallholder farmers in tropical commodities. Recent developments in cocoa and vanilla—such as a 40% drop in the price of cocoa in West Africa and the boom-bust cycle with current high vanilla prices—have highlighted how price volatility and extended periods of low prices can undermine the gains of supply chain programs and create significant barriers to invest in productivity, quality and sustainability for farmers or even reach a living income. Reducing volatility should be of primary importance to all actors.

A productive discussion on price management requires an honest assessment of existing mechanisms

But price is one of the most difficult topics to productively raise in real stakeholder contexts. There are many examples of price management making situations worse. For example, attempts to manage the prices at scale at something higher than the market clearing price run the risk of unintended supply stimulation. Our experience has shown that clear and concise examples of price management mechanisms with honest assessments of impact are needed to support more effective dialogue on strategies to reduce price volatility. Therefore to support informed discussions on the role of price management mechanisms with the larger sustainability toolkit, Aidenvironment and the Sustainable Food Lab collaborated to identify mechanisms at both the supply chain and sector governance level for managing price volatility and protecting value capture by smallholders (such as price stabilization funds, price floors, and long-term cost-plus contract).

A wide variety of price management mechanisms exists

There are many different ways in which prices can be managed or influenced. Certain mechanisms influence prices directly (e.g. through price-setting), others indirectly (e.g. through supply management). There are also mechanisms that do not affect prices, but mitigate the impacts of an unfavorable price environment through complementary measures (e.g. premiums or income subsidies). We distinguish three levers through which price mechanisms could be introduced: governing bodies at sector-level, supply chains and producers.

To be sure, price management options-- particularly at scale – should not be considered in isolation as pricing is one part of the larger picture of competitiveness and depends on capacity and resources of the organization (be it cooperative, supply chain, sector organization) to effectively manage that mechanism within complex and dynamic markets.

Figure 1: Sector, supply and producer-led price management mechanisms

Sector-led	<i>Applicable to governments or sector governance bodies</i>
<ul style="list-style-type: none">• Regulation around price setting and price stabilization funds• Production and trade quota, buffer stock management• Income subsidies, calamity funds, deficiency payments	
Supply chain-led	<i>Applicable to buyers from first buyer to retail</i>
<ul style="list-style-type: none">• Fixed prices, minimum prices• Fixed premiums, flexible premiums• Fair and stable trading relationships	
Producer-led	<i>Applicable to individual farmers and producer organizations</i>
<ul style="list-style-type: none">• Strategic stock management and other physical strategies• Hedging strategies like futures and options• Crop insurance• Crop diversification	

This paper will provide an overview of existing price mechanisms in the cocoa sector

This paper focuses on price management in the cocoa sector. Tree crops – like any crop that has inherent delays in supply response (e.g. 3-4 years to produce cocoa after planting in response to market signals) and where there are sunk costs for farmers that deter changing crops – are particularly vulnerable to high levels of price volatility. The goal of this paper is to see what is being tried at different levels to better manage prices and volatility in cocoa in order to draw lessons.

The paper starts by discussing the sector-led price models in Ghana and Ivory Coast. This is followed by a discussion of the price models of four companies acting in the fine flavor and/or ethical market segment. The third chapter will discuss some of the experience of Fairtrade’s pricing model in the cocoa sector because it is the pre-competitive initiative with most experience in minimum prices and fixed premiums. Chapter four discusses the importance of physical and hedging strategies for producer organizations in managing price risk. The paper ends with a summary of the key findings and presents some reflections that aim to support the discussion and further research by stakeholders on price management.

1. Sector-led models

Ivory Coast and Ghana produce together more than 60% of the global cocoa beans and have strongly regulated sectors. They regulate price-setting, quality and cocoa trading, and tax revenue is partly re-invested in the sector. Both countries have comparable models of market management with some key differences that are explained in this chapter. They also have a different history. In Ghana, the cocoa sector is governed by the Ghana Cocoa Board (COCOBOD), an institution falling under the Ministry of Finance, which has existed for nearly 70 years. In this period, the sector underwent several reforms moving between more regulated and more liberalized regimes. In Ivory Coast, the governing body is the Conseil du Café-Cacao (CCC), which was introduced in 2011 after more than a decade of full liberalization (SEO, 2016).

In Ghana and Ivory Coast cocoa farmers receive a stable farm-gate price throughout the season

A major benefit of cocoa sector governance in Ghana and Ivory Coast is that the 1.5 to 2 million farmers receive a guaranteed stable price for their cocoa throughout a season. They are protected against any short-term price volatility and know the price at the start of the season on which basis they can decide to adapt their farm management. COCOBOD can set prices because their subsidiary Cocoa Marketing Company is the monopolist exporter and sells forward or hedges approximately 70% of the expected harvest. The CCC ensures this because it manages an export auction system through which private exporters are obliged to export. Under this system, 70-80% of the upcoming season's crop is sold forward. Based upon the realized prices of the forward sales and price forecasts, COCOBOD and CCC can estimate the prevailing export price for the next season. A farm-gate price is derived from the expected export price. In Ghana, the aim is that farmers receive approximately 70% of the FOB price, in Ivory Coast, the farm-gate price is set at 60% of the CIF price. In Ivory Coast, the enforcement of the fixed price is supported by a CCC managed traceability system.

The price policies set margins for intermediaries and exporters

In addition to farm-gate prices, the policies also set margins for each actor in the chain through to the exporter. The countries differ in the margin for cooperatives, transporters, Local Buying Companies (LBC) and exporters, either receiving a nominal amount or a fixed proportion of the export price. This has changed internal trading dynamics considerably. The set margin has led to a consolidation of intermediaries, at least in Ivory Coast, as lower margins pushed them to increase volumes. Because of the fixed farm-gate prices, intermediaries cannot (legally) compete for supply on price. Instead they can compete by offering services to farmers, including pre-finance, quick payments or facilitating access to inputs (SEO, 2016). There is criticism, however, that cooperatives and unions of farmer organizations in Ivory Coast receive such low margins and that this prevents them from investing in service development for their members (Südwind, 2016). In fact, many cooperatives rely on sustainability premiums to support basic services to members.

While the farm-gate prices are fixed, buyers can offer an additional premium. They are increasingly paid as part of certification and sustainability programs. In Ivory Coast, the premium allows cooperatives to finance some of its operational costs, secure the cocoa supply of their members and make certain social investments (Molenaar et al., 2016). In Ghana, the COCOBOD allowed certified cocoa to be kept physically segregated from the financial flow of cocoa. This opening up of the trade has made it possible for buyers to shorten their value chain and interact directly with farmer groups. This increased competition by LBCs for the better organized farmers. This is also the case in Ivory Coast.

Both countries re-invest some of the tax revenue in the sector or for other purposes

In both countries, the export of cocoa is taxed. Part of this money is re-invested in the sector. In Ghana, it finances disease and pest control, subsidized fertilizers, seeds/ hybrid seedlings distribution, rehabilitation and replanting programs, jute bags and related items. This revenue also finances various

social programs including investments in road infrastructure, child labour program, a farmers' housing program, and a farmers' pension fund scheme (Quartey, 2013). In Ivory Coast, taxes are used to finance research, extension, market management and investments in social infrastructure.

The following tables show two examples of how the export price is distributed over the different actors and investments. These figures may change between years.

Table 1: Sector-wide fixed distribution of value in the Ivorian and Ghanaian cocoa sectors

Distribution of the CIF price in Ivory Coast (2016)	%	Composition of the projected Net FoB price in Ghana (2011)*	%
Farmer-gate price	60%	Producer Price	76,04
Sourcing & transport to port	6%	Stabilization Fund	0,58
Bean bags	1%	Buyers' Margin	7,94
Cleaning & drying	1%	Hailers' Cost	3,25
Storage & finance	1%	Storage & Shipping Cost	1,05
Export expenses	2%	Disinfestation/Grading/Sealing/Check	1,45
Exporter margin	1%	Sampling Costs	
Freight & insurance	4%	Crop Finance	0,85
Taxes	22%	Scale Inspection and Phytosanitary	0,01
<i>Difference due to rounding of numbers</i>	2%	Government/ COCOBOD	8,64
		Farmers' Housing Scheme	0,02
		Replanting/rehabilitation (cocoa)	0,13
		Replanting/rehabilitation (coffee)	0,04

**The net FOB price is derived after deduction of industry costs related to pests control, jute sacks and related items, scholarship, farmers' pension scheme and specific projects approved by COCOBOD*

Sources: CCC announcement for Ivory Coast and SEO (2016) for Ghana

Price stabilization funds absorb price movements within a season, but are less effective across seasons

Both countries have a price stabilization fund in place. They serve two purposes. First, they cover risks of the proportion of the harvest which is not pre-sold. While 70%-80% of a crop season is presold, there is a risk for the remaining 20%-30% sold on spot markets. In Ivory Coast, the difference between the set-price and spot market price is balanced with a price stabilization fund. When market prices are higher, exporters transfer the difference to the fund. When market prices are lower, exporters are compensated by the stabilization fund. This system allows exporters to pay the fixed price throughout the season.

The forward sales and price stabilization funds protect farmers from the short-term price volatility. It does not, however, influence nor protect farmers from the more structural international price movements as the farm gate price is set annually based on international market pricing. In effect, the result is a delay in more fundamental price signals to farmers. In Ghana, the stabilization fund is also occasionally used to support prices in a low-price environment. The current capacity of these funds is too limited to compensate for larger or prolonged declines in world market prices (Südwind, 2016 & Anaman et al., 2017).

Market management on quality has a positive impact on export prices

There seems to be a strong relationship between the degree of market management and quality reputation. Both Ghana and Ivory Coast are known for their high quality of standard cocoa compared to more liberalized sectors in neighboring countries. Higher quality means higher prices and more value to share. For a long time, Ghanaian cocoa was traded with a premium of 7 to 10% above the average world

market price. But this quality advantage is shrinking since Ivory Coast introduced its cocoa reforms in 2012, which led to an increasing supply of better quality standard cocoa (Südwind, 2016). The impact of the CCC reforms on quality has been significant after it introduced a strict quality management regime.

More stable prices and higher quality did not always go hand-in-hand with higher prices for farmers

While farmers obviously receive more stable prices throughout the season, it is more difficult to say whether the price policies also result in higher prices. A historical analysis of prices in Ghana shows that farmers receive, under the current system, approximately a 10% higher share of the FOB price than in the historical, liberalized period (Anaman et al., 2017). An analysis of prices between 2007 and 2016, all in a more regulated context, shows a small upward trend in terms of real value and share of the FOB price. Meanwhile, the nominal farm-gate price has increased almost sevenfold in the same period (SEO, 2016). However, due to the highly fluctuating exchange rate of the Ghanaian Cedi against the USD, farmers often get far less than 70% of the FOB price (Südwind, 2016).

In Ivory Coast, the introduction of the minimum prices has stabilized the share of the world cocoa price farmers receive at a level considerably higher than in the time of the civil war, when there were no price policies. While the nominal farm-gate prices increased since the introduction of the reforms until 2016, corrected for inflation, the benefits for farmers seem to be marginal. Compared to the increase in world market prices, the position of the farmers deteriorated considerably since the new reforms. This is also partly due to higher taxation within the new system. Farmers in Ghana and Ivory Coast also receive a lower share of the world market prices than more liberalized countries such as Nigeria and Cameroon (SEO, 2016).

The biggest challenge is transparency and accountability

While many stakeholders praise COCOBOD's and CCC's impact on price stability and quality of cocoa beans, there are widespread concerns on the governance of both models. The success of both models is highly correlated with the quality of the governance and history shows that it varies over time. Current concerns are particularly related to the lack of transparency and accountability. In Ghana, prices are set by the Producer Price Review Committee (PPRC). The PPRC is chaired by the Minister for Finance and Economic Planning (MOFEP) and membership includes representatives of farmers, transporters, local buying stations, the Ministry of Finance and Economic Planning and COCOBOD (Quartey, 2013). Despite this multi-stakeholder composition, price-setting is influenced by political pressure. For example, in some past election years prices have been set unrealistically high, which, under less favorable price developments, has forced COCOBOD to empty its stabilization fund or the government to transfer other parts of the public budget to the cocoa sector or to devalue its currency (Anaman et al., 2017).

In Ivory Coast, different stakeholders complain about the lack of transparency of the auction system. It is unclear how prices are determined and how volumes are awarded. A lack of enforcement of the rules, particularly those related to local exporters, also offered opportunities for elite capture and led to a recent crisis (see Text Box 1).

In both countries, there are also concerns about the effectiveness of public expenditures; for example, on pest and disease management, provision of seedlings and fertilizer distribution or extension services. In Ghana, it has been argued that political interference is very common in the mass spraying program because political district heads are in charge of the task forces (SEO, 2016). In Ivory Coast, there is a lack of transparency on how the high taxes are being used and how that translates into benefits for farmers (Südwind, 2016). In both countries, there is a structural lack of transparency on how the resources generated through taxes are re-invested and no impact measurement is taking place on its effectiveness, efficiency and sustainability.

These type of governance issues seem to be common to many public sector-led models. The question is how governance models could be strengthened to improve technical capacity, transparency, and

accountability. A possible option is to place the governing bodies at arms' length of the government, such as a multi-stakeholder governed board, or to have third parties implement certain tasks, such as managing a price stabilization fund. While this still needs a strong system of check and balances, it may make the models less vulnerable to the effects of elections and political regime changes.

Text box 1: Lack of enforcement of the rules of the game undermine stability of the system

Confronted with a sharp decline in global market prices, the CCC model came under pressure. Under this model, exporters bid on permits to export specific volumes at an agreed price. The Coffee and Cocoa Council (CCC), then uses the average auction price to set a guaranteed price for farmers. According to CCC regulations, exporters must provide CCC with a counterparty contract locking in prices. The measure is aimed at preventing defaults caused by speculation that would risk undermining the farmer price. Certain local exporters did not respect these requirements and presented fixed price contracts but had arrangements with their clients that these were actually price-to-be-fixed contracts. With the market rising for four years, this allowed them to make good profits. However, by late 2016 the market was falling, this created problems for the local exporters as they were unable to cover the difference between the CCC fixed price and the lower world market price (Reuters, 2017). After attempts to force the exporters to respect their contracts of 80,000 tonnes went in vain, CCC was obliged to resell them at spot market prices and to compensate the difference with the fixed price from the stabilization fund.

Meanwhile, the defaulted contracts for which no cocoa was being bought, in combination with a bumper harvest and full warehouses at the port, made farmers feel nervous whether they could sell their cocoa. This has reportedly led to situations where intermediaries were undercutting the fixed farm-gate price and farmers accepting them. This case shows how vulnerable sector-led models can be if rules are not enforced and market conditions suddenly change.

Since then, CCC reduced the farm-gate price from 1,100 FCFA to 700 FCFA in the next season and also reduced taxes from 22 percent to 16 percent to soften the impact of the price drop. It has also tightened requirements for counterparties of export contracts and changed its own leadership.

Price policies by Ghana and Ivory Coast can be undermined by the long-term supply and demand imbalance

Both countries do not operate independently from the world market. As the biggest global producers, they have an important influence on the global supply of cocoa beans. The recent decline in market prices suggests oversupply. This is partly caused by a stabilizing demand and a bumper harvest. In addition, each year higher and stable (nominal) prices have also resulted in more intense harvesting and an expansion of the plantation area. It shows that attempts to manage prices may result in unintentional supply stimulation. This effect is even stronger when prices are somewhat higher than the market price. Therefore, price policies at such scale need to be complemented by sound supply management.

2. Supply chain-led models: company models

Companies also develop their own pricing models. This chapter takes a closer look at the models of four (relatively niche) chocolate brands: Tony’s Chocolonely, Ritter Sport, Theo and Taza.

Some companies top up market prices with premiums while others decouple from market prices altogether

Companies use and set prices, floor prices and premiums in different ways. For example, Theo has set fixed prices for their suppliers. They pay these prices independently of the market prices. Tony’s sources from Ghana and Ivory Coast where they pay government-set fixed prices, plus the Fairtrade Premium plus an additional premium. The additional premium is to close a calculated “living income gap” and is a function of the government-set price and a living income benchmark. Ritter Sport and Taza follow international market prices. Ritter fixes prices every few months, Taza does sometimes as well. On top of the market price, they pay a premium. Ritter Sport uses a model of fixed premiums and Taza negotiates premiums above a guaranteed minimum value. Both companies use a guaranteed minimum price. These minimum prices are in line with the Fairtrade Minimum Prices, even though their cocoa is not necessarily Fairtrade certified.

Table 2: Pricing models of four chocolate brands

Company	Cocoa type	Mechanisms	Prices and Premiums (2015/16/17)
Tony’s Chocolonely	Bulk	Market price + Fairtrade Premium + Premium to close the Living Income gap	Ghana: government price + \$375 Ivory Coast: government price + \$600
Theo	Fine flavor	Fixed price	\$3,500 fixed price
Ritter Sport	Fine flavor	Variable price + minimum price + fixed premium	Nicaragua: New York market (min. price at \$2,000) + \$300 quality premium + \$200 certification + \$100 infrastructure bonus
Taza	Fine flavor	Market price + minimum price + negotiated premium with a minimum value	New York market (min. price \$2,300) + >\$500 premium

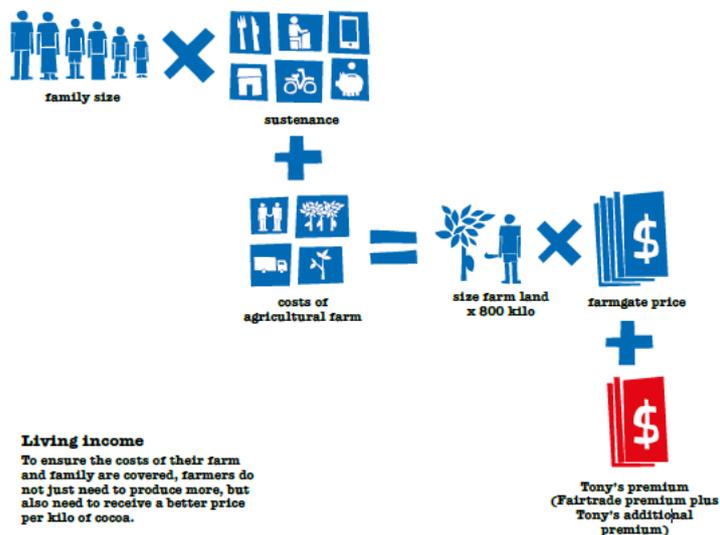
The rationale to set prices and premiums can be cost-driven, based on value addition or be producer-centric

Theo, Taza and Ritter Sport require high quality and certified cocoa and their price model is partly driven by ensuring access to this quality as well as by ethical and commercial considerations. The basis on what these companies set their prices and premiums differs. Theo has set its price based upon a good understanding of the costs for production, post-harvest, export, import and manufacturing (i.e. a cost-plus model based upon the cost of production and a decent profit margin). Taza defines the premium level on what makes business sense for them and allows everybody in the supply chain to share in the value of their premium products. Ritter distinguishes premiums based on value-added attributes such as quality specifications, sustainability, and investment in quality and production.

In contrast to the other three companies, Tony’s operates in a bulk market. Their price setting is producer-centric and based upon the calculation of a living income. This consists of the income that an average farmer household needs for a decent living and the costs to run a responsible farm (See Figure 2). This calculation takes into account equally the responsibility of farmers to professionalize their farms

and work towards increasing their income through improving productivity and quality (ISEAL, 2016). Tony's price also considers the costs for cooperatives.

Figure 2: Tony's Chocolonely's pricing model



Source: Tony's Chocolonely. Annual FAIR Report 2016/17

The companies offer other favorable trading terms such as pre-finance, quick payments, long-term supply deals and hedging opportunities

In addition to prices and premiums, the companies offer their suppliers other favorable trading terms such as pre-finance and quick payments. This can be crucial for cooperatives and exporters since in many producing countries farmers expect to be paid the same day they deliver their cocoa. Without available cash, it can be difficult for buyers to get hold of their cocoa and fulfill contracts. All four companies pursue long-term relationships with their suppliers. In support of this, Taza and Ritter Sport set contracts with their suppliers annually. Theo sets contracts for 12 to 18 months to provide them with the needed predictability. Tony's commits itself to buy from a farmer for at least 5 years. They believe that this is important to help them invest in their future. None of the companies demand exclusivity of their suppliers (i.e. that producer organizations must sell to the supporting buyer). Taza also facilitates access to the futures market for their suppliers through their importer to hedge against price risks.

These models have successfully brought higher returns and stability to cocoa farmers, but face challenges due to market dynamics

These models have successfully brought higher returns and stability to cocoa farmers. They are however not free of challenges. Buyers may not be able to sustain to pay higher prices if they are not rewarded by their customers. Hence, some of the price models or price levels will only work within specific markets. A prolonged drop in world market prices can also create challenges to sustain certain price levels, particularly in bulk markets.

The fine flavor companies also experience increasing competition on price in certain origins which can make it challenging to procure the required and sometimes even contracted volumes. This is particularly challenging with fixed price contracts. Poor margins and poor management at cooperatives and exporters also pose risks to continue the business relationships underpinning these models.

There exist several questions about their scalability to bulk cocoa

The question arises whether these price models (e.g. minimum prices) are feasible in mainstream markets. The three fine flavor companies doubt whether their models are applicable to bulk cocoa. They do not expect consumers are willing to pay the required price for cocoa and the industry is not willing to share that price with producers. Tony's steep growing volumes may prove them wrong, although their market share is still small compared to the leading chocolate brands.

Since the examples in this chapter involve small-scale buyers, the higher prices offered do not seem to have a significant impact on the supply. Similar to the sector-led models, the question arises about how the application of these models at scale would stimulate supply beyond sustainable levels.

Certain aspects are implemented in mainstream markets. For example, pre-finance and quick payments have become basically a license to operate in many origins. There is also a tendency to more stable trading relationships with longer-term contracts between brands, traders and producer groups.

3. Supply chain-led models: the case of Fairtrade

As an alternative to their own price policies, supply chain actors can use mechanisms developed by pre-competitive initiatives such as voluntary sustainability standards. Within many agricultural sectors, Fairtrade is the standard system with the longest track record in working with minimum prices and fixed premiums. This chapter discusses some of the insights and considerations based upon Fairtrade’s experience in the cocoa sector. Unless otherwise mentioned the information in this chapter is derived from Fairtrade’s consultation document in support of the review of its pricing model for cocoa (Fairtrade, 2017).

Fairtrade’s pricing model has two key mechanisms: a Minimum Price and a Fairtrade Premium

The Fairtrade Minimum Price (FMP) should protect producers against extreme low prices. Its calculation is based on the principle of covering average costs of sustainable production of cocoa, enabling the “average” producer to produce in an economic and financially sustainable way. The FMP does not only cover the average costs of sustainable production but also considers market acceptance to ensure that the FMP does not compromise the producers’ ability to sell their product. The Fairtrade Premium (FP) is intended to provide additional investment capacity for development. The FP is paid to the producer organization to improve their social, economic and environmental conditions.

Table 3: 2018 price setting for cocoa

Quality	Form	Country / Region	Price level	Unit	Currency	Fairtrade Minimum Price	Fairtrade Premium
Fairtrade conventional	beans	worldwide	FOB	MT	USD	2000	200
Fairtrade & Organic	beans	worldwide	FOB	MT	USD	2300	200

The current Fairtrade price setting for cocoa takes a global approach, meaning the price model applies to all Fairtrade cocoa producing countries. The only distinction made is that Fairtrade Organic has a higher FMP than Fairtrade conventional (2300 USD/MT vs 2000 USD/MT). Fairtrade is currently conducting a review of its minimum price and minimum price policies with new policies expected in 2019.

Provided there is market uptake, the Fairtrade model protects against the deepest price busts and provides clarity on premiums

Important benefits of the Fairtrade model to producer organizations is the protection against the deepest price busts and the clarity on how much premium they receive per metric ton of cocoa beans. This secure price can also guide producer’s investment decisions. This differentiates the Fairtrade model from other voluntary certification standards such as Rainforest Alliance and UTZ where no minimum price exists and premiums are negotiated between producer groups and buyers. The FP usually exceeds the premiums of the other two systems, which tend to erode over time (Molenaar et al., 2016). Of course these benefits depend on the market for the Fairtrade certified cocoa beans. In cocoa, there has been a substantial gap between the supply and the market uptake with approximately one third of production being sold as Fairtrade between 2013 and 2015 (Fairtrade, 2014-16).

The Fairtrade model offers some interesting insights and considerations relevant to setting minimum prices and premiums. They will be discussed below.

There are important trade-offs between global and regional minimum prices and premiums

While the global FMP and FP are easy to manage and to communicate, there may be an advantage in establishing different FMP and/or FP in different origins. This will allow consideration of the variation in production, socio-economic, market and policy contexts. However, regional differences related to varieties, cost of production and living income are not so clear cut and there are many exceptions. In addition, introducing a regional pricing approach could result in issues related to unfair competition. For example, in the bananas sector the FMP and FP differs per region following variations in the cost of sustainable production. There is evidence that these differences have partly contributed to a shift in demand for Fairtrade bananas to countries with a lower FMP and/or FP (Molenaar et al., 2016).

Table 4: Trade-offs between global and regional minimum prices and premiums

Advantages of global prices and premiums	Advantages of regional prices and premiums
<ul style="list-style-type: none"> • Easier to set and manage and to compare with global prices • Create a level playing field minimizing risk of arbitrage and market distortion 	<ul style="list-style-type: none"> • Account for contextual differences in farming variables and living costs • Adapt to the diversity of market practices in different origins (government pricing, bulk vs specialized cocoa trading)

Premiums for producers can escalate further down the supply chain

Margin escalation of price differentials and Fairtrade Premiums can result in a much higher price for buyers of semi-finished Fairtrade cocoa products. While a higher price for Fairtrade semi-finished products is naturally expected, these higher prices can far exceed the fixed cost of the FP. Margins can particularly escalate if companies do not pass along the absolute value paid, but a percentage. This is for example the case when a retailer applies a X% margin on a Fairtrade certified product. As its procurement price includes the nominal value of the FP, consumers will have to pay an additional X% over this FP. Such mark-ups can exist along the full value chain. To reduce margin escalation along the supply chain, one possible approach is to have end-buyers transfer the FP directly to the cooperative. This requires full traceability, something which currently only exists in a small proportion of the bulk cocoa market (including the certified supply chains).

A strategic question is whether the payments of the minimum price and the use of premium should be conditional or left to the producer organization

In support of Fairtrade empowerment principles, the payments of the minimum price and the use of premium is determined by the producer organization itself, with guidance in the Fairtrade Standard to adopt a democratic decision-making process. However, if one wants to ensure that farmers receive a sustainable price to at least cover his/her production costs (or living income), then one could consider defining the proportion of the FMP for distribution to farmer members (while allowing sufficient margin for the producer organization to sustain operations). It appears that a relatively high proportion of the FP is distributed to cocoa farmer members as direct cash payments, which reflects the ongoing poverty levels. One could consider placing conditions on the premium use to ensure farmers invest in productivity and diversification and farmers organizations invest in managing their business efficiently. Since 2016, Fairtrade encourages strategic investments in productivity and quality based on mutual commitment and long-term partnerships with buyers.

How to incentivize paying for a living income?

Since the current FMP is designed primarily as a price protection against market lows, Fairtrade has recently challenged itself on how to be more ambitious on supporting famers to achieve a living income. To this end, Fairtrade develops a Fairtrade Living Income Reference Price (FLIRP). This reference price should allow an average farmer household with a full-employment farm size and an adequate productivity level to earn a living income when selling its produce at this price level. The FLIRP will be

indicative for the FMP and FP setting. However, rough estimates of the living income gap in Ivory Coast already predict a FLIRP to be significantly higher than the current FMP or market prices. Therefore, it is important to assess feasible ways to enable progress towards the FLIRP in combination with different pricing mechanisms (e.g. FMP, FP, alternative pricing tools or separate income funds) and how these should be implemented. Fairtrade considers the following options for bridging the gap between actual market prices and the FLIRP:

- Compulsory versus voluntary payments of the Living Income differential
- Immediate versus gradual increases towards payment of the FLIRP

4. Producer-led models: physical and hedging strategies

Producer organizations can play an active role in price risk management. In producing countries without fixed prices, individual producers are free to negotiate prices while engaging with markets. Producer organizations can manage their own price risk by implementing physical strategies (i.e. mechanisms to trade physical cocoa) and these can be complemented with hedging strategies that further reduce price risk exposure (i.e. financial mechanisms). Hedging, for instance, is hardly applied by producer organizations in the cocoa sector. This chapter discusses the potential of both strategies and draws from examples of coffee and cocoa producer organizations in Latin America.

The relevance of physical and hedging strategies in Ghana and Ivory Coast

As this paper discusses price stability and value capture in the cocoa sector, there is considerable focus on describing how the models relate to Ghana and Ivory Coast, the sector's two largest producers. These producing countries have fixed farmgate prices for the season. It is then important to note that the producer-led models discussed below lose some of their relevance as they mainly relate to organizations that export. Still, physical strategies remain valuable in managing cash flow risks and avoiding contract defaults. In Ivory Coast where cocoa producer organizations are allowed to export, hedging strategies can be an important tool for exporting cooperatives (i.e. COOPEX members).

Physical strategies

Producer organizations organize their members around market access, service delivery, and represent their interests to sector stakeholders. The management of their physical activities and associated risks determine to a large extent the viability of their business. There are four main physical activities that can increase or decrease a producer organization's risk exposure as it relates to price: procurement, sales, price-fixing, and financing.

Physical strategies can be a clear and effective way for cocoa producer organizations to manage price risk

Producer organizations can design their procurement in a way that reduces market risks such as price and volume fulfilment. They should pay a farmgate price and set payment terms that are competitive in the local market. The price, volume, and timing of cocoa buying, collecting, and storage should be aligned with the producer organizations' sales and contracting strategies. This alignment allows them to target a sales price that covers costs of operation and ensures a solid margin in the national or international market. The relevance and effectiveness of these strategies affects the organization's relationship with its members, their ability to buy cocoa to fulfil contracts, and sell cocoa at margins that make the organization viable.

The management of internal procurement and external sales is a balancing act that, if optimized, can enhance profitability

Producer organizations can develop a sales strategy that defines a target sales price and appropriate mix of contract types (i.e. open or fixed price) taking into account expected market dynamics and competition.

Table 5: Advantages and disadvantages of fixed price and open contracts with customers for producer organizations

	Advantages	Disadvantages
Open contracts	<ul style="list-style-type: none"> • Allows for a medium-term commitment to be made with a buyer without an immediate negotiation of a fixed price • Gives producers time to fix prices when the market is more attractive 	<ul style="list-style-type: none"> • Promotes speculation (i.e. the expectation that prices always get better) and does not protect a producer's margin • Limits pre-financing as most commercial banks view open contracts as risky
Fixed price contracts	<ul style="list-style-type: none"> • Guarantees producers a desired revenue • Serves as collateral to secure pre-financing 	<ul style="list-style-type: none"> • Cannot gain from price increases • Exposes risk of fluctuating exchange rates as contracts often in another currency (e.g. US dollar)

Based on the contracting options, producer organizations can determine as part of their pre-season sales strategy the share of their contracts that are open and fixed price. This strategy should take into account that an open position requires a high level of capacity to accurately analyze the market dynamics. Producer organizations at the low spectrum of professionalism could enter into fixed price arrangements - meeting their target sales price - for the majority of their contracts (e.g. 90%). More professional producer organizations could limit their fixed price contracts to a minority (</25%) to take advantage of positive changes in the market.

Producer organization should implement a price-fixing strategy that is suitable for their procurement context and responds to market movements to limit their risk exposure and protect their margin.

Table 6: Advantages and disadvantages of the main price-fixing strategies for producer organizations

	Advantages	Disadvantages
Buy and hold: Cocoa is bought and hold for a certain period before it is sold (i.e. long position)	<ul style="list-style-type: none"> • Gives producers time to sell when a satisfactory sale price can be agreed • Straightforward to implement 	<ul style="list-style-type: none"> • Highly speculative and unlikely to achieve their target sale price
Back to back: Cocoa is bought and its sale price fixed within a very short period of time	<ul style="list-style-type: none"> • Greatly limits risk exposure due to the quick turnaround between purchase and sale 	<ul style="list-style-type: none"> • Requires high level of coordination between procurement and sales teams
Fix and buy: Fix a sale price before or early in the season and buy the cocoa later needed to fulfil the contract (i.e. short position)	<ul style="list-style-type: none"> • Guarantees producers a desired revenue 	<ul style="list-style-type: none"> • Exposes the risk of default if sufficient cocoa cannot be bought as expected

Based on the price-fixing options, producer organizations can determine the thresholds for market movements (i.e. X price by Y month) and the number and timing of their open contracts to limit their risk exposure and protect their margin. Producer organization could fix prices when the majority of the cocoa for a specific contract (e.g. 70% - 80%) has been procured.

Effective price risk management through physical strategies requires leadership, competences, and accountability by producer organizations

Although physical strategies are part and parcel of the role and responsibility of producer organizations, their execution is often limited by the organizations' lack of management and technical capacity.

Physical strategies require a longer-term vision on, for example, market position and a focus beyond short-term gains. For effective price risk management, sound financial management and competent staff is key managing the balancing act of internal procurement and external sales in volatile markets. Decision-making on procurement and sales needs to be responsive to member needs and responsibilities as well as to the commitments to buyers. The integrity on price, payment terms, and service delivery will promote or undermine a member's willingness to deliver their cocoa. Integrity equally affects the buyer's perception of counterparty risk (i.e. the producer delivers the cocoa even if the market goes higher than the contracted price). The challenge of executing physical strategies without strong management and technical capacity is exacerbated by the agricultural, market, cultural and policy factors in play.

Hedging strategies

In addition to their physical management, producer organizations can engage also in financial markets as a form of risk management. Hedging is applicable to those producer organizations directly exposed to international price fluctuations (e.g. exporting cooperatives selling FOB). There are two main financial mechanisms for a producer organization to manage price risk: futures contracts and options.

Futures trading brings market participants together for price discovery and offers a means to strongly protect an actor's margin by transferring risk

The futures market from a price perspective serves two purposes: 1) price discovery - the more buyers and sellers active in the marketplaces, the more accurate the price reflects the supply and demand; and 2) risk transfer – market actors buy or sell a futures contract of an opposite position to a physical contract they have entered into. Producer organizations could participate in the futures market to ensure price stability and predictable profit stream in volatile physical markets. Producer organizations could take a futures position both when they buy cocoa from their members (i.e. sell a futures contract) and when they sell cocoa to an exporter or importer (i.e. buy a futures contract). In general, a producer organization should buy a futures contract to reduce the risk that stock might not be sold in the short term. They should sell a futures contract when the current market price is attractive.

The basics of futures contracts

- A standardized contract between two unknown parties who agree on a certain price today for standard cocoa with (intended) physical delivery and payment in the future.
- Contracts are traded by commercial actors active in the physical business e.g. cocoa exporters, processors and chocolate manufacturers as well as by institutional and private investors.
- They are traded in two exchanges in London and New York that act as clearing houses to guarantee fulfilment of contracts removing counterparty risk.
- To trade futures contracts, a market actor must maintain a certain daily margin level in their brokerage account that serves as a down payment on the outcome of the actor's futures trading.

Text box 2: How a cocoa producer organization could hedge against price risk with futures trading

In October, a producer organization has procured 10mt of export grade cocoa from its members. The market price quoted on the exchange is \$2,800/mt. The organization currently has not agreed a sale contract for this cocoa and is 'long' in inventory. The organization decides to sell a futures contract at the current market price of \$2,800/mt.

Two months later, a sale contract is in place. In December, the market price is \$2,400/mt. In their physical trade, the organization made a loss of \$400/mt during the 2 months window. In this scenario, the organization decides to close their current futures market position and buy a futures contract for \$2,400/mt. The downward market movement realized a gain of \$400/mt by futures trading, which fully compensates for the loss in the physical trade.

As seen in the above example, futures contracts offer producer organizations a means to protect their margin. By taking a future position that is opposite to that of their physical contracts, producers fully transfer risk and therefore minimize potential losses but at the same time limit their additional gains if the market were to move in a favourable direction. The protected margin translates to additional value that can be shared with the membership of the producer organization.

Futures trading involves costs and management capacities that may be beyond the reach of most cocoa producer organizations

Despite the potential benefits, the costs and technical and financial capacity required for futures trading may limit their ability to engage in futures trading. The daily margin call on a futures account requires a producer to maintain an amount that covers the value of the underlying futures contracts. Although not prohibitively high for all producer organizations, margin calls can be costly for producers with a position that covers a majority of their physical sales volume. For most producer organizations with limited cash on-hand, this can be a significant amount that also carries a high opportunity cost. Engaging in the futures market, especially in the age of algorithms-based trading, also requires a highly competent and dedicated manager. In many producer organizations, there is a relatively high level of turnover in management and this lack of continuity does not support the need for highly proficient staff to take advantage of the futures market's benefits.

As a result of the above constraints, the majority of producer organizations worldwide do not engage in futures trading. In Latin America where the most cases exist, few producer organizations have their own brokerage accounts. Most producer organizations make use of their buyer's account (i.e. exporter, importer) who provides hedging services as part of the trading relationship.

Options are another financial mechanism available on the exchanges to manage price risk.

Buying an option provides a price floor to minimize losses or allows for margins to possibly be increased

Producer organizations can hedge against price risks by buying an option. There are two types of options that can be bought: calls and puts. A *call* option allows the buyer to take advantage of a price increase in cocoa futures whereas a *put* option allows an actor to take advantage of a price decrease.

When buying an option, the producer organization takes the opposite position to a physical contract they have entered into. For cocoa producer organizations that have sold a contract with an attractive price but do not yet have the inventory (i.e. a short position on

The basics of options

- An option gives the right, but not the obligation, to trade a futures contract at a certain price (i.e. strike price) until certain date (i.e. liquidation).
- Buying an option acts as insurance against future price changes.
- The buyer of an option is only exposed to the risk involved with the price paid for the option (i.e. premium).

physical contracts), then a hedging strategy would be to buy a *call* to hedge against a potential price increase in cocoa futures. This means that the producer organization can trade a futures contract at a price that is lower than the market in addition to the good price already secured on the physical contract, thus enhancing their sales margin. At the same time, it puts the organization in a position to continue buying from its members at the current local price. For producer organizations that have the inventory but have not yet sold a contract (i.e. a long position on physical contracts), the strategy would be to buy a *put* to protect them from a potential price decrease of a physical contract. This means that the producer can trade a futures contract at a price that is higher than the market after already having bought from their members at a high price at the time, thus reducing their losses.

Buying price insurance entails opportunity costs and potentially high gains but may be only within reach of some cocoa producer organizations

Buying options allows for quick and strategic sales decisions. A *put* option buys some ‘peace of mind’ while a *call* option enables the producer to be a more active market player. While futures trading requires significant funds to meet daily margin calls, the cost of buying an option is published and clearly known to the producer organization to assess, decide, and pay for if attractive. Premiums do vary widely, in relation to the probability that an option moves towards the call or put price, making options either relatively cheap or expensive at a given time. In late October 2018, our check of premiums showed them ranging from \$120/option for a strike price of \$2300/mt to some \$9000/option for a strike price of \$1200/mt.

Buying options also requires less hands-on management than futures trading. First, this is the case since there is less potential loss. Second, once an option is bought, it withstands market volatility within trading periods. The less time involved in managing the option allows producer organizations to focus on their physical activities.

The manager responsible for buying options still must have a good technical knowledge to manage the timing of the purchase. The duration of an option is typically a short period (e.g. a few months) and the buyer can quickly lose the value spent on the insurance (i.e. premium) if the price change does not occur within the specified time period. This means that a producer organization buying options not only has to anticipate well the movement of the market but also when to purchase the option.

For producer organizations not engaged in hedging, buying options involves a cost not previously incurred. Despite the potential benefits, it may be challenging to convince the organization’s members to make such an expense as can be the case generally with insurance products. This would be part of a strategic decision by the organization showing that it values insurance and would budget accordingly.

The ability of cocoa producers to benefit from hedging is largely conditional on support from buyers with the required expertise

The physical strategies discussed in this chapter are within the operational scope of a producer organizations but their success depends on organizational leadership and staff capacities. Capacity building features in the sustainability programs of most trading houses and cocoa processors who could strengthen the focus on business management as it relates to their suppliers’ physical activities.

Hedging demands even more professionalism and is only accessible to advanced cocoa producer organizations. The futures market is a sophisticated space that would be uncharted territory for cocoa producer organizations. The ability of producers to manage price risk via the futures market is largely conditional on the support from trading houses and cocoa processors who have the required expertise and experience. In chapter two, we highlighted the case of Taza that collaborates with their importer to buy options on behalf of cocoa producer organizations. Trading houses and cocoa processors could explore introducing price risk management into their training curricula and integrating hedging

strategies into their financial service package. A key success factor is a risk-sharing arrangement in the early stages of support made between the producer and the buyer as well as, in some cases, the chocolate maker when they negotiate fixed-price contracts before the cocoa season. This arrangement could involve splitting the cost of buying options or factoring it into the cocoa price. Trading houses and cocoa processors could pilot this support among their current supply base in relevant producing countries with the condition that producer organizations optimize their physical strategies in parallel.

5. Conclusions and recommendations

Extreme price volatility can have disastrous effects for the overall performance of a sector. Boom-bust cycles discourage farmers to invest in growing more cocoa or can even bankrupt them entirely. It also undermines stable trade relationships and the effectiveness of any investment of supply chain actors in their supply base. This paper discussed some of the price mechanisms which are in use within the cocoa sector. This chapter summarizes the key findings and presents some reflections that aim to support the discussion and further research by stakeholders on price management.

Sector-led models

Sector-led models provide millions of farmers with more price stability and enable strategic investments

The sector policies in Ghana and Ivory Coast ensure that 1,5 and 2 million farmers receive a stable farm-gate price throughout the season for their cocoa beans. The pricing model of combining forward sales and seasonal price fixing, protects farmers from short-term price volatility and delays the transfer of more fundamental price movements to the next season. Both sectors are also successful in maintaining a high quality of cocoa beans and therefore receive a quality premium on the world market for bulk cocoa.

While farmers are protected from intra-seasonal volatility, the price stabilization mechanisms are not sufficient to protect them from more fundamental price developments, at least not in real terms. In both sectors various taxes and levies are raised to re-invest in the sector, for example in research, extension, input distribution and social programs.

The swift introduction in 2012 of the CCC-led governance model in a fully liberalized Ivorian cocoa sector suggests that similar models could be introduced in other origins and do not necessarily depend on the existence of decades-old institutions such as COCOBOD in Ghana.

Deeper impact of sector-led models requires more transparency and accountability

To be effective in managing supply, demand, and prices in the long-term, sector management organizations need transparency and accountability in decision-making. Such an improvement would overcome critical risks like political pressure to raise prices in election years and “rent-seeking” opportunities in the licensing and price-setting process. This suggests the need for stronger technical basis of the decision making, such as formula-based decision-making. There are also concerns around the effectiveness of the public sector investments in for example input distribution. Weak governance issues create opportunities for elite capture and undermines the trust in these systems. Some argue that the real reasons for the collapse of the international commodity agreements in cocoa in the 1980s were political rather than economic (Koning and Jongeneel, 2006 & Gilbert, 2009). Hence it is critical to ensure good governance. In addition to on-going efforts in both countries to improve transparency and accountability, an option is to put (part of) the market management at arm’s length of the government, at international level or to be managed by third parties.

Sector-led price mechanisms need to be complemented by supply management, preferably based upon regional coordination and sound macro-economic modelling

With more transparent and accountable governance in place, complementary mechanisms could be considered such as larger stabilization funds and strategic buffer stock management to absorb some of the inter-seasonal price fluctuations. However, recent experience shows that sector-led measures to support farm prices cannot be introduced in isolation of the market. If they are not complemented with supply management, they risk creating oversupply undermining the continuity of these models. The

experience in the past also teaches us that. The (cocoa) commodity agreements in the 1980s tried to manage the supply by buffer stocks and national export quotas. However, as they did not control the volume of production itself, this led to smuggling and overflowing of stocks (Koning & Jongeneel, 2006).

The need for supply management puts into question the validity of price support alone. Fifty years of experience with the common agricultural policy of the European Union has shown that price support in isolation results in overproduction and the need to distort markets in order to maintain acceptable price levels (see Text Box 3). Consequently, they have shifted over time from market and product support, through prices, quota, export subsidies and import duties, to producer support. In the current model, farmers receive income subsidies regardless what they produce and how much they produce. This type of support has made farmers more market-oriented since their production decisions respond primarily to market demand and prices (European Commission, 2012). While this could lead to increased price volatility, farmers are partially protected to this by the income support.

The combination of price and supply management would benefit from regional coordination. For example, it would be counterproductive if either Ivory Coast or Ghana try to control supply to improve prices, while the other country would push for higher volumes. In October 2018, Ghana and Ivory Coast made the promising announcement that the countries will collaborate to harmonize their trading systems, including price-setting. However, if the ambition is to influence international markets, rather than react to them, then it is recommended to base this upon sound macro-economic modelling of supply – demand dynamics and do this in a transparent way.

Text Box 3: How the EU Common Agricultural Policy shifted from price support to income support

In the early days, the European Common Agricultural Policy's (CAP) primary objective was to promote food security by boosting production. Price support was the main mechanism, which soon led to costly and politically-embarrassing surpluses - the so-called 'food mountains'. To align production with market needs, production quotas and exit incentives were introduced (e.g. early retirement subsidies or set-asides). Increasing criticism about the degree of market distortion pushed the EU to tailor its system more in line with the world market. This was done through moving from market and product support (through prices) to producer support (direct income support), while reducing trade tariffs. Initially, income support was based upon production, but later it was decoupled from production and is now based upon farm size regardless of what and how much is produced. To mitigate external effects, subsidies are conditioned when a farmer complies with food safety, environmental and animal welfare regulation. In addition, the increasing awareness that thriving farming requires thriving rural communities, led to increased investments of the agricultural budget into rural development.

	1960s & 1970s	1980s	1990s	2000 and beyond
Objectives	Productivity through price support	Supply management	Competitiveness	Sustainability & rural development
Mechanisms	<ul style="list-style-type: none"> • Investment support • Minimum prices (through intervention purchases) • Import tariffs • Export subsidies 	<ul style="list-style-type: none"> • Production quota and exit incentives (e.g. early retirement subsidies) 	<ul style="list-style-type: none"> • Shift from market and product support (through prices) to producer support (through income support linked to production) 	<ul style="list-style-type: none"> • Income subsidies decoupled from production • Compliance with food safety, environmental and animal welfare regulation • Rural investments
Unintended consequences	<ul style="list-style-type: none"> • Overproduction • Exploding public expenditure 	<ul style="list-style-type: none"> • Lack of competitiveness • Market distortion • International friction 	<ul style="list-style-type: none"> • Sustainability issues 	

Source: European Commission (2012) & RLI (2013)

Along with the traditional tools, supply management can be supported by land zoning or promoting diversification, and needs to be embedded in comprehensive governance of the agricultural sector

For cocoa, managing supply will require additional strategies such as land zoning to restrict the area where cocoa can be produced. One could consider a production quota for individual producers, but this is likely too difficult to implement in the cocoa smallholder context. Promoting flexibility in the production base may also help to avoid booms and busts. This could be achieved by promoting farm diversification. Particularly when combined with market intelligence systems, it allows farmers to shift resources between crops. Success may even depend on the availability of non-farm alternatives enabling farmers to exit the agricultural sector and create more space for more efficient farmers. Ultimately, the objective to reduce price volatility and promote value capture by farmers requires a comprehensive governance of the agricultural sector, and the place it has in the wider economy. This should be based upon a sound vision on the performance of the agricultural sector, including its competitiveness, profitability, reliance, sustainability and transparency (see Aidenvironment, IIED and Sustainable Food Lab (2017) for an introduction to sector governance).

There may also be value in introducing mechanisms with less rigorous interventions in the market

Measures which can positively impact prices but without disrupting markets, include market information systems disseminating prevailing prices and expected production levels to inform producer's investment decisions. Although there is less flexibility to adapt productivity to market circumstances with tree crops than with annual crops, producers can vary their harvest intensity. One could also introduce and enforce quality standards to promote value capture by producers. Other measures include the strengthening of producer organizations to establish shorter and better market relationships, licensing of traders with the aim to exclude unscrupulous ones, providing extension services on quality management, crop diversification and farm business management and market promotion. All these measures can also help to make the price or supply management mechanisms earlier mentioned more successful.

Supply chain-led models

Various examples of smaller-scale supply chain-led models exist which result in price stabilization and increased value capture by farmers

Price stabilization and value capture can also be promoted by supply chain actors. This paper looked at examples of companies decoupling what they pay from market prices while others followed market prices but guaranteed a minimum price and paid significant additional premiums. Companies use different rationales to set prices and premiums. They can base it upon a good understanding of costs of production, a commercially viable sense of sharing value or upon a calculation of what farmers should earn to make a decent living. In addition, companies can offer favorable trading terms such as pre-finance, quick payments, long-term supply deals and hedging opportunities.

Minimum prices, flexible premiums and cost-plus pricing could be applicable in mainstream markets, particularly in the context of contract farming

The above price models are applied in the fine flavor or ethical markets in supply chain which are fully traceable between the end user and farmer or farmer group. The question arises whether these models are scalable in mainstream markets for bulk cocoa. While trading practices such as pre-finance or quick payments are already widely applied, there seems to be little effort to buffer price volatility for farmers or establish a structural way to pay farmers prices that allow them to make a decent living. Still, certain elements of the presented models may be applicable in mainstream markets. Once consideration could be a minimum price being voluntarily adopted by the leading chocolate brands and retailers. This can give farmers the confidence to invest in their plantations. While it may be possible to establish, there are several concerns. First, it will be difficult to enforce such minimum price, as there will always be buyers trying to test its boundaries. Secondly, if the floor price is set too high, it will most likely result in an oversupply of cocoa with the risk that the minimum price becomes de-facto the maximum price. It may be worthwhile to investigate whether minimum prices can be set temporarily and adopted to market circumstances.

Another option to consider is a flexible premium. In this model, premiums will depend on market dynamics: in times of low price environment, premiums will be higher and in times of a high price environment they will be lower (see Text Box 4). As any mainstream pricing model that pays a significant premium above the market prices, this could result in market distortion, i.e. oversupply. To avoid this, a flexible premium model might work better in isolated, traceable supply chains, for example with contract farming.

Text box 4: The flexible premium model

Within a flexible premium system, the risk of price volatility can be shared between farmers and companies. The amount of risk that is shared can also be adjusted where necessary. The cocoa buying company and a cooperative agree on an upper limit. If the farmgate price exceeds this level, the company pays no premium. If the price falls below that level, the amount of the premium is increased step-by-step. The more the price decreases, the higher the premium rises, until a minimum farmgate price level is reached. When the minimum farmgate price, which can be fixed at a level to guarantee a living income, is reached, the increase premium becomes equal the decrease in farmgate price.

In short: the crucial parameters for the level of the premiums would be:

- the upper limit, beyond which no premium is paid
- the percentage of a price decrease, which is covered by the company
- a minimum price level, which can be fixed to guarantee a living income

Flexible premiums can be negotiated directly as a private sector agreement between farmers or their organizations and cocoa buying companies. These negotiations could take place on a regional level, avoiding an unworkable global one-size-fits-all level. Additionally, as the negotiations happen between a single company and a farmer organization, there is no conflict with competition laws.

Source: Südwind (2017)

In contract farming, an alternative pricing model to the flexible premium can be a cost-plus model, where prices are fixed based upon costs of production plus a decent margin. In agriculture around the world, many good examples of contract farming arrangements exist which work on this basis and where prices are essentially decoupled from market prices. However, there are also many examples where fixed prices do not work in a competitive environment. Particularly with smallholders the risk of side-selling is high. Nonetheless, the opportunities to scale contract farming with fixed prices or flexible premiums may be worthwhile to further investigate. Such research should consider the particularities of tree crop systems like the relatively little control farmers have to change production at short notice.

Fairtrade's pricing model offers relevant insights on introducing price differentials and premiums

There is a big difference between whether pricing models are defined by individual companies or whether they are applied in a pre-competitive way. Fairtrade is the pre-competitive model which has the longest experience in using minimum prices and fixed premiums in the cocoa sector. Their model shows that it can protect farmers against the deepest price busts. It also provides them with some additional income and the ability to invest in better farming practices or social development. However, these benefits are highly dependent on the market uptake of the Fairtrade certified cocoa beans. As this has been approximately one third of the total supply of Fairtrade certified production of cocoa beans in the past couple of years, it shows that also Fairtrade may need to consider managing supply more in line with demand.

The Fairtrade case provides important insights on price and premium setting, both in a pre-competitive and competitive setting. For example, there are important trade-offs between global and regional minimum prices and premiums. While regional prices allow to account for contextual differences in farming variables and living costs, it may also create opportunities for arbitrage and market distortion. The Fairtrade example also shows the risk of margin escalations along the supply chain as unintended consequence of introducing price differentials at producer level. It also raises the question whether one

should condition the distribution and use of price differentials and premiums to ensure they are invested in creating more profitable farms, efficient farmer organizations and thriving communities.

Pre-competitive action can create a level playing field and allow for strategic investments at wider scale

Fairtrade is a model where rules around pricing and payments are implemented more or less consistently by individual companies which buy into the system. There can be merit in defining such rules in a pre-competitive way as it can facilitate a level playing field and sector-wide strategic investments at wider scale than through individual supply chains. Text Box 5 shows the example where the Malawi tea sector developed a common approach to pay higher prices for the specific goal of closing the living wage gap of tea plantation workers. The initiative also investigates the feasibility to decouple the payments of additional wages from specific supply chains, but to manage this through a collective fund. Other examples exist which pool resources from end buyers and transfer them independently of the supply chains of these buyers. For example the Better Cotton Growth and Innovation Fund collects the market based premiums from the companies that use Better Cotton. These funds are used to make joint investments in training and capacity building in BCI implementation across the cotton sector.

Text Box 5: Pre-competitive modelling and distribution of price differentials in the Malawi tea sector

Under Malawi Tea 2020, a price discovery model has been developed which aims to give clarity on sustainable procurement practices in the tea industry. It shows to what extent buyers need to pay an additional contribution to suppliers in order for them to attain paying living wages to farm and factory workers. The model provides a fair, sustainable, and negotiated price range within a framework provided by a Mombasa market reference and a base price that still provides for a sustainable business model. The interesting feature is that several buyers have committed to use this model as a basis to determine their additional contribution to close the living wage gap. In other words, the companies use a common, pre-competitive model to negotiate the prices and determine price differentials with their suppliers.

Any differential from buyers over the suggested floor price reference plus any potential savings for producers derived from forward contracting and any favourable (early) payment terms are capped by the living wage annual target and diverted towards the living wage payment.

Currently, Malawi Tea 2020 investigates how additional buyer contributions can be distributed to workers across the tea industry. Two disbursement options are considered. The first option is that buyers pay the differential directly to the farm they procure from. This is called the vertical option. The second option is to collect the price differential in a Living Wage Allowance Fund, from which it will be distributed equally across the Malawi tea workforce. This is called the horizontal option. The horizontal option would be quite innovative as it shifts value transfer from the 'traditional' way within a supply chain to a collaborative model.

Source: Malawi Tea 2020: Living and Actual Income, Learnings from Tea Sector, Malawi Experiences, presentation at the Living Income Community of Practice workshop, Berlin 2017

Producer-led models

Price risk management could be promoted among producers

In pursuit of price mechanisms that could be implemented without worrying about supply management, one could also look at mechanisms which producers could apply. Mechanisms which producers can

apply, such as crop insurance, strategic stock management, and hedging through futures and options, are hardly applied in the cocoa sector. Physical strategies can be a clear and effective way for cocoa producer organizations to manage price risk. The potential benefit of hedging can be significant whether by protecting margins through futures trading or by minimizing potential losses or increasing margins through buying options. Despite the benefits, hedging in a sophisticated financial market requires considerable costs and technical expertise that is a challenge for most cocoa producer organizations. Options buying, for instance, can be more accessible, particularly if supply chain actors support producer organizations with relevant capacity building and financial services. We found one example where a fine flavor brand facilitated the access of their suppliers to a trading desk enabling them to buy options (i.e. price insurance). In practice, various of the larger cocoa traders have experience in offering price insurance to their suppliers in other sectors, such as coffee. Although less relevant in the Ghanaian context due to the fixed prices and the Cocoa Marketing Company (CMC) as the sole exporter, hedging can be highly relevant to cocoa producers in other origins, even in the case of Ivory Coast (i.e. exporting cooperatives). Having access to services to hedge price and exchange rate risks can be valuable to any producer which also exports. Producer organizations are likely to play a crucial role in price risk management but will need to be strengthened accordingly. Producer organizations can also play an important role in promoting crop diversification among their members to make them more resilient to the volatility of one crop.

6. How to move towards improved price and supply management?

This paper presented potential price management mechanisms in the cocoa sector that warrant further investigation

Many of mechanisms presented in this paper deserve further investigation to assess their current or potential effectiveness as part of a sector transformation strategy. It is recommended not only to look at examples in the cocoa sector but also to learn from cases from other sectors. The most promising mechanisms identified in this paper include:

Sector-led

Applicable to governments or sector governance bodies

- Promote transparency and accountability of sector led models by possibly introducing more multi-stakeholder-driven and international governance
- Introduce supply management along with price management at sector-level (e.g. land zoning, diversification, buffer stock management)
- Introduce complementary measures (e.g. market information systems, quality standards, trade licenses, extension services, market promotion)

Supply chain-led

Applicable to buyers from first buyer to retail

- Promote minimum prices in mainstream markets
- Promote cost-plus pricing or flexible premiums in combination with traceable supply chains, contract farming and direct payments between end users and producers
- Offer favorable trading terms such as pre-finance, quick payments, long-term trading arrangements
- Consider pre-competitive modelling and distribution of price differentials

Producer-led

Applicable to individual farmers and producer organizations

- Promote physical and hedging strategies through producer organizations
- Promote crop diversification

Price and supply management mechanisms should not be considered in isolation

The above price management options, particularly those applicable at scale, should not be considered in isolation as pricing is one part of the larger picture of competitiveness. The success of a price management mechanism will depend on many factors, including the viability of prevailing production systems and the organization level of producers around markets and professional service delivery. It will also depend on the capacity to effectively manage the mechanisms within complex and dynamic markets, whether at producer group, supply chain or sector-level. Some measures, such as minimum prices, stabilization funds and buffer stock management, will also require important financial means. All of these aspects and more need to be considered when assessing options to manage prices and supply. Furthermore, price and supply management should be considered as part of a sector transformation strategy. Their effectiveness will largely depend on complementary measures such as creating effective producer organizations, viable service delivery models, fair and inclusive supply chain models, quality management systems, and a sound policy, regulatory and juridical environment.

High volatility, extended periods of extreme low prices, and delays in supply response increase the urgency to introduce price and supply management

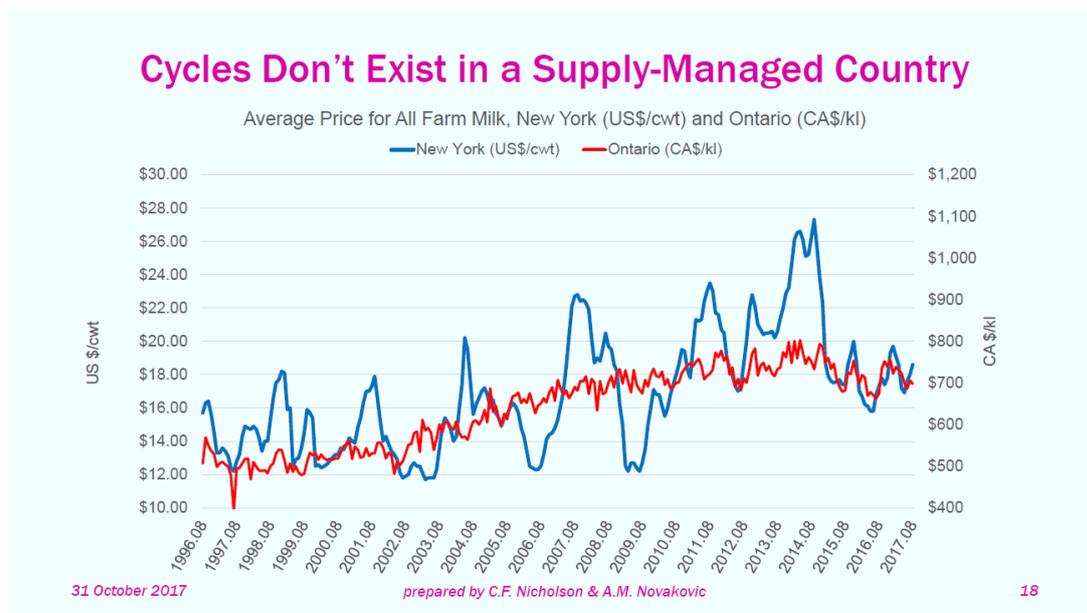
There is also the question of when one should be looking at price and supply management. This seems to be relevant when crops are particularly vulnerable to high volatility and extended periods of extreme low prices that perpetuate poverty. These effects can be strengthened when there are structural delays to increase supply in response to price signals (as is the case with tree crops such as cocoa) and when farmers are willing to continue production in the face of extreme low prices due to sunk costs, lack of capital, lack of alternative livelihood opportunities and the ability to subsidize production through other income sources.

Text Box 6: Supply management by the Canadian Dairy Commission

Canada’s dairy sector is one of the few agricultural sectors that is self-sufficient – providing income security for farmers and requiring no government subsidy. Since the 1965 Milk Act, the dairy market in Canada has been a managed market system built on three pillars: 1) **producer pricing**, 2) **production discipline**, and 3) **import control**. The act set up two farmer-managed marketing boards in two regional milk pools. All of the milk produced is sold through the marketing boards. Quotas are set in each state and distributed to farmers with an annual allocation for new entrants. Processors request volumes from the marketing board and end prices are set by retailers.

The Canadian Dairy Commission was established to oversee the system and meet two objectives: 1) provide efficient producers with the opportunity to obtain a fair return for their labour and investment, and 2) provide consumers with an adequate supply of high quality dairy products. Farm gate prices are updated each year based equally on the change in cost of production and on the Consumer Price Index.

This dairy system has greatly reduced volatility and positive net returns for farmers each year. Today, Canadian dairy farmers receive USD \$26 to \$27/hundred weight, which can support a living income for a family farm. In contrast, US dairy farmers in the New England region receive prices of \$16 to \$17/hundred weight, which is below an average cost of production of \$20 to \$21/ hundred weight. The chart below shows how the price stability in Canada in comparison to volatile prices in the US.



Source: <https://dairyproposals2018.com/dairy-summit/presentations/>

The choice of mechanisms should depend on the nature of the problem, its scale and contextual factors

The choice of mechanism will also depend on the problem one wants to tackle (e.g. volatility or poor value capture) and the scale at which price issues need to be tackled (e.g. a company, supply chain, or country). Contextual factors will also determine the feasibility and scalability of a particular mechanism. For example, in a poorly organized smallholder-dominated sector, producer-led mechanisms are less likely to succeed or will be difficult to scale. In a weak institutional environment, certain high-impact sector-led mechanisms may be difficult to introduce. However, when sector organizations and governments can demonstrate the capacity to manage quality and extension services, then maybe some of the lighter price management tools such as an auction system or price stabilization fund could be brought into the discussion. Appendix II presents more examples of relevant variables.

Different actors have different roles to play

Companies can look at their own supply chains, invest in traceability and promote more favourable trading relationships with their suppliers. These could include setting a minimum price or paying (flexible) premiums, as well as offering more stable off-take, direct and quicker payments, pre-finance or price insurance. Governments have a large toolbox they can use. It ranges from lighter mechanisms such as product quality standards or price transparency to heavier market interventions such as price-fixing and buffer stock management. Any strategy should consider short- and long-term effects on prices, supply and the competitiveness of its sector. It should also pursue integrating commodity-specific policies in the wider agricultural and rural development policies. Pre-competitive initiatives and particularly voluntary standards could pay more attention to supply chain dynamics and promote fairer trading relationships, including minimum prices, flexible premium models and direct payments of premiums. They will also need to balance the supply and demand ratio to ensure farmers receive the full market benefits for their certified produce and avoid structural overproduction. This could be done by promoting more stable supply chains and by emphasizing crop diversification in their standards. Development actors could support producers in crop diversification and value addition. Together with civil society and multi-stakeholder platforms, they also have an important role to play in initiating and guiding the dialogue on price and supply management while recognizing prevailing anti-trust laws. One could also argue that anti-trust laws need to be revised to accommodate a level playing field for internalizing social and environmental costs into prices.

A discussion on price and supply management can be supported by principles of stakeholder engagement

As the broader discussion on price management proceeds, several key principles could guide a constructive dialogue by stakeholders who share the common objective of improving farmer livelihoods.

The following four principles could support the discussion by stakeholders on price management:

1. *Inclusive and balanced sector representation:* This complex yet important discussion must include government, companies, civil society, and farmers with all representatives having an equal voice.
2. *Open engagement and commitment to a shared solution:* Stakeholders and high-level management must be committed to a solution that benefits all stakeholders. This requires a willingness to engage in a constructive manner that works toward solving this fundamental problem. Engagement should be open, dynamic, and be supported by sharing of (pre-competitive) knowledge and experience for learning purposes.
3. *Recognized gradual progress:* The process of reaching and realizing a shared solution is gradual and progress in satisfying stakeholders' interests is incremental. Expectations should be managed while upholding the ambition to fundamentally improve cocoa farmer livelihoods and investments in cocoa farming.
4. *Effectively organized dialogue:* The appropriate forum that is designated to convene such a discussion should consult the represented stakeholders when setting the agenda. The discussion

must be high-quality, frequent, and involve less powerful stakeholders early on. The convener must ensure an integral process to organizing the dialogue and be able to allocate sufficient resources (staff, budget, time, and documentation).

5. *Communication*: Stakeholders should receive clear and tailored communication in a timely manner to support their contribution and feedback to the convener.

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Acronyms:

- EU CAP: Common Agricultural Policy of the European Union
- COCOBOD: Ghana Cocoa Board
- CCC: Conseil du Café-Cacao in Ivory Coast
- CMC : Cocoa Marketing Company
- FP: Fairtrade Premium
- FMP: Fairtrade Minimum Price
- FLIRP: Fairtrade Living Income Reference Price

Appendix I: Overview of price management mechanisms

This appendix presents an overview of price management mechanisms which can support value capture by producers or reduce the effects of price volatility to producers. They are not cocoa-specific but drawn from various commodities in different geographies.

Pricing policies

Price controls. There are three possibilities for direct interventions in commodity prices: a) price ceilings (maximum), b) price floors (minimum); and c) fixed prices. Prices can be set with a fixed nominal amount or a fixed percentage of a fluctuating price (export, farmgate). The frequency of price-setting includes daily, annually, or per season. The objective is to provide farmers with a stable price and more value, typically receiving a certain proportion of the export value. This type of mechanism is typically used by public actors but examples exist of use by companies in their own supply chains. One rationale to fix prices is a cost-plus model where prices are fixed based upon an understanding of the cost of production including a decent margin.

Premiums. Producers who meet certain standards (e.g. quality, sustainability) receive a premium additional to the price paid for their product. Premiums are typically a fixed value per volume (MT) of product independent of the current market price. This fixed value is either a mandatory minimum (e.g. Fairtrade, company quality programs) or a negotiated amount agreed upon between producer and buyer in advance of production.

Premiums can also be a flexible value per volume (MT) of product in relation to the current world market price or the minimum price set by the producing country (fixed or flexible). As the market price decreases, the premium increases to ensure a living income.

Price stabilization funds. This mechanism compensates farmers when the final selling price is below a set (minimum) price. It is intended to moderate sharp price drops below the pre-season price (and production cost).

Guaranteed purchase systems. This allows farmers to sell as much of their output as they choose and avoid being left with unsold produce. Guaranteed purchase systems can follow market prices or have an established minimum price, which protects them against volatility.

Price information systems. A system that openly shares information on international commodity prices (typically as part of agricultural market information systems). Price information systems can reduce business risks (e.g. planning, negotiation power) and transaction costs as well as enable value capture for farmers.

Product aggregation or trading platforms

Auctions. Auctions have trading rules that govern the exchange of goods with prices determined by supply and demand, which promote market efficiency and transparency. Produce is sold to the highest bidder and is destined for both domestic and export markets. Auctions can be voluntary or compulsory. Goods in auctions are physically present (in contrast to commodity exchanges) and managed at warehouses. Auctions are often coupled with a warehouse receipt system.

Commodity exchange. A mechanism that acts as a public marketplace. Commodity derivatives are traded through contracts such as futures, forwards, and options without the physical presence of the traded goods. The aim is market efficiency, price stability, and farmer value capture.

Stock management (e.g. warehouse receipt system). Commodity storage facilities can protect suppliers from seasonal price risk variability by storing the product and selling it during favorable price periods. It is typically a mechanism promoted by the public sector. Warehouse receipt systems support value

capture for farmers Warehouse receipts can also be used as collateral for loans (inventory credit system).

Financial mechanisms

Derivative contracts (futures & options). A standardized contract between two unknown parties who agree on a certain price today for a commodity asset with (intended) physical delivery and payment in the future. Future contracts are traded to hedge against future changes in supply and demand, protecting suppliers and buyers against volatility. Those hedging in the futures market take the opposite position that they hold in the physical market. Increasingly, they are traded by speculators.

Options give the right but not the obligation to trade an asset until a certain date at the price specified in the contract. Options acts as insurance against future price changes.

Legal bond contracts. A financial mechanism where farmers or cooperatives sell their products forward to central banks (through a legal bond) for future delivery and receive a cash equivalent

Crop insurance. A mechanism that can assist farmers in mitigating production and price risks, which protects them against volatility. Many forms exist, varying from self-insurance (e.g. precautionary saving), sharing of risks (e.g. sharecropping), to insurances against specific events (e.g. low crop prices, erratic weather conditions).

Farmer aggregation - Contract farming

Contract farming. An agreement between supplier and buyer on pre-determined production quantity and quality, and (future) date of delivery. Prices can be fixed at signing the contract or based upon market prices at the time of delivery. In some cases, public and private actors set rules for contract terms, including exclusive buying rights for companies. Contract farming is often combined with the provision of certain services by the buyer to the producer (e.g. seed, inputs or finance). This mechanism can promote value capture for farmers and bring price stability during a season.

Physical strategies to price risk management by producer organizations

Procurement

Procurement by producer organizations refers to the purchasing prices, product types, reception or off-take, and payment terms involved in commodity buying, collecting, and storage, which affects the relationship of a producer organization with its members, their ability to buy to fulfil contracts, and sell at margins that make the organization viable.

Sales

A producer organization's sales strategy determines their product specifications (e.g. quality, sustainability), target sales price, contract type (i.e. open or fixed price), and the shipping calendar, which allows for protecting against or benefiting from market changes as well as accessing pre-finance.

Price-fixing

Producer organizations define a price-fixing strategy for open price contracts to limit risk and optimize margin. Price-fixing is based on three main approaches: buy and hold, back to back, and fix and buy.

Financing

Financial management involves the financing costs, collateral, financial performance, and financial control that fund the producer organization's operations. Sound financial administration contributes to minimize the risk exposure of other physical activities such as procurement and sales.

Volume-based mechanisms

Strategic buffer stocks. A mechanism that attempts to offset price movements by gradually releasing (part of the) commodity supply in the market. Both public and private actors operate buffer stocks. The aim is to protect suppliers against volatility.

Production, export, and import quota, bans and subsidies. Quotas are a supply management mechanism that restricts production of or trade in a certain commodity during a certain period of time to protect against price volatility. Quotas are typically enforced by licenses – the issuance of property rights – that can be sold/auctioned or allocated to individuals or companies. Similarly, bans are a market protection mechanism that prohibits the export or import of a certain product to/from a certain country. Import or export subsidies may also be applied to manage supply.

Subsidies

Deficiency payments. Government compensation to commodity producers for the difference between the fixed price and the national average market price. The amount of compensation can cover part or the entire difference in price. Deficiency payments complement producer income. Payments may also exist to compensate for lost production due to a natural disaster (e.g. drought, flooding).

Income subsidies. Governments can provide producers with an income subsidy to improve value capture. Subsidies can be coupled or decoupled from the production output or farm size.

Input subsidies. Subsidies for inputs or technology can reduce farmer costs and increase productivity and hence increase the net value capture by producers.

Other relevant definitions

- *Farm-gate price:* The price farmers receive for their cocoa
- *FOB 'Free On Board' price:* Term of sale under which the price invoiced or quoted by a seller includes all charges up to placing the goods on board of a ship at the port of departure specified by the buyer
- *CIF 'Cost, Insurance, Freight' price:* Trade term requiring the seller to arrange for the carriage of goods by sea to a port of destination and provide the buyer with the documents necessary to obtain the goods from the carrier.
- *World market price:* The price for cocoa as established on the London and New York stock markets.
- *International commodity agreement:* An undertaking by a group of countries to stabilize trade, supplies, and prices of a commodity for the benefit of participating countries. An agreement usually involves a consensus on quantities traded, prices, and stock management.
- *Living Wage:* A wage that enables a worker to afford a 'decent' standard of living for him- or herself and his or her family.
- *Living Income:* The net income of a household earned / generated under conditions of decent work, sufficient to enable all members of the (average) household to afford a decent standard of living.

Appendix II: Guidance on selecting price management mechanisms

A wide variety of mechanisms exist

There are many different ways in which prices can be managed or influenced. Certain mechanisms influence prices directly (e.g. through price setting), others indirectly (e.g. through supply management). There are also mechanisms which do not affect prices, but mitigate the impacts of an unfavorable price environment through complementary measures (e.g. premiums or income subsidies).

Examples of mechanisms include:

- Price setting - mechanisms which set prices or the bandwidths of prices. Examples include: fixed prices, minimum or floor prices
- Premiums - mechanisms which involve the payment of premiums additional to the price of a product. Examples include: fixed premiums, flexible premiums
- Contractual arrangements - mechanisms which define the contractual arrangements between trading partners. Examples include: forward contracting, contract farming, Code of Conducts on trading practices
- Trading platforms – mechanisms which organize trading transactions and price formation. Examples include: auctions and commodity exchanges
- Financial mechanisms - mechanisms which reduce price risks. Examples include: hedging, crop insurance, risk based financing
- Subsidies – mechanisms which subsidize cost of production or complement producer income. Examples include: input subsidies, income subsidies, deficiency payments
- Supply management - mechanisms which influence the volumes available on the market. Examples include: buffer stock management, quota (production, export, income)
- Information systems - mechanisms which make available information on prices, supply and demand forecasts, etc. Examples include: market information systems

The success of a price management mechanism is highly context dependent

Important contextual variables which determine the potential effect of price management mechanisms can be found in the market and supply chain dynamics, the strength of the institutional environment, the production and product characteristics and presence of a service sector. This paper introduces a framework to guide the thinking on what tools to consider in a particular context. It uses three filters:

1. The problem that needs to be tackled
2. The scale at which the problem needs to be tackled
3. Production, product and market characteristics

They are explained below.

Filter 1. The problem that needs to be tackled

The first filter looks at the issue one wants to tackle. Price management mechanisms can contribute to three key objectives:

- *To reduce or protect against price volatility*: this refers to mechanisms which reduce (some) of the price volatility or create a buffer to absorb (some of the) shocks. Volatility could be reduced at different tenures (e.g. intra-season or inter-season).
- *To increase value capture by specific actors*: this refers to mechanisms which ensure certain actors (e.g. producers) receive a higher or even certain price, premium or income.

- *To increase market efficiency*: this refers to mechanisms which organize trade and increase transparency on prices and underlying dynamics such as supply and demand forecasts. The assumption is that this will lead to more efficient markets.

A mechanism can influence one or more objectives. The combination of mechanisms can strengthen the realization of an objective or create opposite effects. For example, the introduction of an export auction can promote price discovery, but, when compulsory, it could impede the formation of direct trading relationships and the ability to increase producer value capture by paying premiums.

Filter 2. The scale and sector context at which the problem needs to be tackled

The second filter looks at by which actor or at what level the pricing issue is best tackled. This is highly dependent on the intended scope of influence. If the intent is to increase value capture of producers in one particular supply chain, then mechanisms which can be implemented within that supply chain or at producer level are most appropriate. If the ambition is to influence value capture or price volatility of a national commodity sector, then one should look for mechanisms which are applied at that level. Alternatively, one could also look at supply chain or producer relevant mechanisms which can be scaled relatively easy.

We identified three levels at which mechanisms could be introduced: producer, supply chain or sector level. Sector level has different scales and includes sub-national, national and international. Potential mechanisms at each of these levels, may depend on the presence of an effective service sector.

Three interventions levels and necessary enabling conditions

Producer-led	Supply chain-led
<p>Mechanisms which are applied by individual producers or producer organizations.</p> <p><i>Enabling conditions:</i> Producers are medium to large-scale enterprises or well-organized smallholder groups. They have an understanding on how to manage price risks and increase value capture and access to the necessary services.</p>	<p>Mechanisms which are applied by supply chain actors.</p> <p><i>Enabling conditions:</i> Markets have a certain degree of organization and/or concentration, supply chains are relatively transparent and buyers have leverage over the producer base. They have access to necessary services.</p>
Sector-led	
<p>Mechanisms which are applied at sector level.</p> <p><i>Enabling conditions:</i> The public sector or other governance bodies have the capability to set and enforce effectively market management mechanisms.</p>	

The contextual characteristics of the sector determine to a large extent the feasibility and scalability of producer, supply chain or sector-led mechanisms. For example, in a poorly organized smallholder dominated sector producer-led mechanisms are less likely to succeed or will be difficult to scale. In a fragmented market environment or in a weak institutional environment supply chain and sector-led mechanisms will have less scalable impacts. The presence of a viable, often financial, service sector can also be a condition to successfully introduce certain mechanisms.

Combining the first two filters allow to categorize mechanisms according to the issue they resolve and the level at which they are applied.

Price management mechanisms clustered around their objective and intervention scope

Objective	Producer-led mechanisms	Supply chain-led mechanisms	Sector-led mechanisms
Price stabilization	<ul style="list-style-type: none"> • Hedging • Crop insurance • Risk based financing 	<ul style="list-style-type: none"> • Forward contracting • Minimum prices • Fixed prices • Flexible premiums • Hedging • Strategic buffer stock management 	<ul style="list-style-type: none"> • Minimum prices • Fixed prices • Price stabilization funds • Strategic buffer stock management • Legal bonds contracts
Increased farmer value capture	<ul style="list-style-type: none"> • Stock management (e.g. warehouse receipt system) 	<ul style="list-style-type: none"> • Direct sourcing • Contract farming • Fixed and flexible premiums • Input subsidies / investment support • Guaranteed market uptake 	<ul style="list-style-type: none"> • Minimum prices • Fixed prices • Guaranteed purchase systems • Income subsidies / calamity funds / deficiency payments • Input subsidies / investment support • Production/ export/ import quota, taxes or subsidies • Exit incentives
Increased market efficiency			<ul style="list-style-type: none"> • Auctions • Commodity exchanges • Market information systems • Code of Conducts on Contracting

Filter 3. Production, product and market characteristics

The third filter introduces various variables in the production process, product and market dynamics which influence the applicability of certain mechanisms. The following table presents the variables and how they influence the applicability of the mechanisms.

Variables influencing the effectiveness of pricing mechanisms

Variable	Influence on the effectiveness of the mechanisms
Perishability of a product	High perishability reduce the relevance of (buffer) stock or warehouse management and may make export quota more complex in case of oversupply
Perennial vs. annual crops	Perennial crops reduce the relevance of fast changing production and export quota as producers are locked-in the crop
Length / transparency of a supply chain	Short and transparent supply chains facilitates direct sourcing and payments of a premium
Demand for traceability	A demand for traceability can create constraints to introduce trading platforms (but this can be solved)
Market share	High market shares facilitate the potential effectiveness of buffer stock management as the ability to corner the market increases
	High market shares may facilitate price-setting, but may need to be complemented by supply management measures to avoid structural oversupply

Export / import balance	High export or import dependency increase the relevance of export or import quota
Presence of reference prices	The presence of a reference market price (e.g. from commodity exchanges) facilitate price setting measures and flexible premiums
Presence of a derivative market	The presence of a derivative market (e.g. futures and options market) allows to hedge against future price fluctuations and it informs forward contracts
	The presence of future markets allow to reduce risks of pre-seasonal price setting through forward selling

There are several trade-offs to consider when aiming to manage prices

In addition to the above filters, different trade-offs should be considered when considering price management interventions.

Price management vs. supply management

Supporting producer prices can have important positive short-term effects. However, if support measures are structural with prices higher than market prices, this could create an imbalance in supply and demand. Higher prices could attract new farmers in the sector or refrain less efficient farmers to exit the sector. While smaller players may continue to pay outside of the market without changing the market fundamentals, very large buyers and governments need to consider the effect on future supply. The resulting potential future oversupply could make the support measures more expensive or, if the measures are not maintained, will further aggravate the issue that it intended to solve. Therefore, it is recommended to combine any large-scale price support measure which supply management measures. Examples of such measures include production quota, incentives for farmers to exit the sector and market promotion.

Producers vs. consumers (domestic vs. international)

Higher prices for producers may result in higher prices for consumers. For important food items this may affect the food security of the consumer base. For luxury goods, this may result in consumer shifts to other products. When products are primarily produced for export, then this may lead to opposing interests between nations or between domestic and international industry.

Sector impacts vs. other impacts

Public-driven price management mechanisms can be expensive and become a considerable drain on public resources. This may reduce a country’s capacity to invest in other public goods (e.g. health, education, security). This requires careful consideration. There are also price management mechanisms which do not require resources from outside the sector (e.g. price stabilization funds funded by an export levy, fixed value chain prices differentials following market prices).