



PRICE RISK MANAGEMENT IN THE COFFEE AND COCOA SECTORS

September 2019

LIST OF ACRONYMS

ANACAFE	Guatemala National Coffee Association
CAGR	Compound annual growth rate
CFC	Common fund for commodities
DFS	Digital financial services
DFI	Development Finance Institution
DFID	Department for International Development, United Kingdom
FI	Financial institution
ICE	Intercontinental Commodities Exchange
IHCAFE	Instituto Hondureño de Café (Honduran Coffee Institute)
NGO	Non-governmental organization
OTCC	Over-the-counter contract
PPP	Public-Private partnership
PRMM	Price risk management mechanism
RFUK	Rainforest Foundation UK
SFF	Schimidt Family Foundation
SHF	Smallholder farmer
USAID	United States Agency for International Development

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I. EXECUTIVE SUMMARY

Introduction

Seventy percent of the world's coffee and most of the world's cocoa is produced by smallholder farmers (SHFs) whose production and livelihoods are threatened by several production and market risks. For most coffee and cocoa producing countries, most of which are low- or middle-income countries, coffee or cocoa exports represent a large share of their total exports (e.g., coffee represents 7% of exports in Colombia and 13% in Honduras, and cocoa represents 10% of total exports in Ghana and 50% in Ivory Coast). However, many farmers, whose livelihoods depend on coffee or cocoa production, live in poverty because of structurally low prices that, since 2013, have frequently been lower than the cost of production, and – regardless of low prices or not – growing coffee and cocoa are risky activities. Farmers face both production and market risks. Changing weather patterns, pests, and disease can affect production. In addition, market prices are incredibly variable, and farmers often bear a large share of the volatility. For example, between 1994 and 2018, future coffee contract prices (export FOB) moved between a low of \$0.53 per pound and a high of \$2.5 per pound. For farmers, these price swings mean a difference between making large losses one harvest and significant profits the next one. The price volatility creates price risk for farmers and all actors along the value chain and holds back investments that could otherwise help actors professionalize, drive productivity, improve quality, and increase longer-term value creation.

Price volatility in the coffee and cocoa sector is mostly driven by the volatility in international market prices. Coffee prices are formed at the intercontinental commodity exchange (ICE) and are commonly known as the Coffee C Contract for Arabica and Robusta Coffee Futures for Robusta (in this document these prices will be referred to as international reference prices). These prices depend on global supply and demand, as well as speculative activity from commodity traders. Coffee prices defined in the ICE reach farmers producing coffee through the value chain. Roasters and/or importers use the international reference price as a benchmark and agree on a price with country exporters. Exporters deduce their costs to set a price at which they purchase coffee from intermediaries or farmer groups, which then deduct additional costs to determine prices to farmers. As a result, the share of the export price farmers receives depends on local value chain characteristics. This share can be as high as 95% in Vietnam where there is a lot of competition in the market, and as low as 61% in Ethiopia where there is a significant regulation and there are a lot of intermediaries along the value chain. Most farmers, especially those that are not organized into groups such as cooperatives, have little bargaining power over the prices they face (known as farmgate prices). In the cocoa industry, prices are also defined in the ICE for cocoa produced in South Asia and the London Financial Futures and Options Exchange (LIFFE) for cocoa produced in West Africa and the Americas. The farmgate price for cocoa farmers depends on local value chain conditions and government regulation.

Coffee and cocoa farmers, however, are poorly equipped to manage price risk, putting these industries at risk. Most farmers operate at low margins or losses and have little or no access to finance, which limits their capacity to smooth their income between years. Other players in the value chain cover their risk using sophisticated price risk management mechanisms (PRMMs). These are strategies and tools that can help actors across the value chain mitigate their

exposure to price risk and strengthen their resilience against unexpected changes in prices. However, PRMMs rarely reach smallholder farmers, especially if they are not organized into cooperatives. This means that farmers experience substantial uncertainty and volatility in their income and are unable and/or have little incentive to make investments in their coffee farms. This threatens the security of long-term supply for the industry as a whole, because coffee or cocoa production may fall as a result of reduced productivity (due to little investments in plantations) or because farmers exit the sector looking for more viable economic opportunities. The income volatility of coffee farmers may also have unintended consequences such as rural to urban migration or emigration.

This report assesses what is being done in terms of price risk management and what models could potentially reach SHFs at scale. The report focuses on price risk management solutions for the global coffee industry, inspired by coffee and cocoa sectors across the world. The document includes deep dives and proposed solutions for two coffee producing countries, Guatemala and Honduras, but the PRMMs identified are relevant across smallholder farmer coffee-growing countries more broadly. We conducted a landscape of PRMMs and mapped 11 coffee and cocoa value chains to identify what PRMMs are being used and what are the required conditions for their implementation. We researched PRMMs used in the cocoa industry to identify any useful case studies that can be transferred to the coffee sector. Based on the findings, we developed a taxonomy of PRMMs and identified the key success factors for each. We also outlined a set of enablers that help increase farmer resilience and that can support the implementation of PRMMs. The different PRMMs and enablers are not mutually exclusive and can often reinforce each other. The appropriate combination of PRMMs and enablers will depend on the market conditions, as some PRMMs are more suitable for specific types of markets or require certain value chain characteristics to be effective. The findings presented in the report are based on an extensive literature review, more than 30 remote interviews with stakeholders in the coffee and cocoa sectors, and 77 stakeholder interviews in Guatemala and Honduras. Stakeholder interviews included small and large farmers, producer groups, intermediaries, exporters, importers, roasters, sector organizations, financing and technical assistance organizations, government institutions, and industry experts.

Types of PRMMs and PRMM Enablers

There are four categories of PRMMs and PRMM enablers that address price risk directly or create conditions that facilitate PRMMs. These mechanisms address price volatility either by decoupling price formation for farmers from the commodity exchange, increasing flexibility for the time to sell coffee, reducing the transaction costs of selling small quantities, or reallocating risk among actors. Each of these categories of PRMMs and PRMM enablers are suited for different circumstances and involve some trade-offs.

Partially decoupling prices for farmers from the commodity exchange allows farmers to potentially obtain higher and more stable prices. These mechanisms involve creating independent market places like digital platforms to connect buyers and producers directly or conducting quality competitions to auction winning coffees. In this case, prices are set through auctions or agreements between producers and buyers, which allow market actors to elicit the true price of the specific coffee being traded and therefore, prices tend to be more closely driven

by local market fundamentals, and less influenced by coffee prices on international exchanges. This means that it is at least somewhat easier to predict prices for all players in the value chain. It also means that volatility is reduced and predictability (even if there is volatility) is increased because price-formation is more dependent on local fundamentals that local buyers and producers have visibility of, and because speculative investors on local exchanges have less influence on local price setting. These mechanisms only apply for high-quality or specialty coffees, where buyers are interested in connecting directly with producers to ensure the origin of the product and how it is processed. Buyers of commodity coffee, however, would have few incentives to participate in such a market because these markets are likely to elicit higher prices, and buyers would likely be unwilling to pay higher prices when cheaper options, with similar characteristics, are available through the stock exchange (see Section 3.2, page 20 for more details).

Increasing the flexibility on the time to sell coffee lets farmers separate the time coffee is harvested to the time it is sold, allowing farmers to better manage the price realized if prices are volatile. These mechanisms are warehouse receipt systems where farmers can store their coffee at the time of the harvest and sell their coffee once prices have reached a level that they are comfortable selling at. A central benefit of these systems is from their ability to empower farmers to reap the benefits of market upswings without large investments beyond the opportunity cost of selling their product quickly. In practice this means that farmers need to be able to process their coffee to parchment, so it can be stored for more than a few days, have access to a warehouse to store it at, and that they have access to cash-flow or finance to cover the opportunity cost of not selling the coffee immediately. The feasibility of using warehouse receipts in a certain country also depends on whether there is a supportive legal and regulatory framework. For example, whether there is a law in the country that regulates the operation of warehouse receipts and the services and benefits provided by warehouse receipts operators are regulated (e.g., product stored in the warehouse is insured, receipts are negotiable). The legal and regulatory framework in a given country can be assessed through movable collateral – warehouse receipts index in the World Bank’s Enabling Business Agriculture (EPA). These mechanisms don’t work in instances where prices fall continually or fall for an extended period of time (beyond the three years that coffee in parchment can generally be stored for, in typical ambient warehouses) (see Section 3.2, page 25 for more details).

Aggregating resources between actors in the market is used to reduce the transaction costs of marketing or experienced price volatility for producers. These mechanisms focus on aggregating financial and physical resources between different players in the value chain to spread the risk between multiple actors and therefore, reduce the risk experienced by individual farmers. These include (i) aggregating resources between a group of producers, (ii) developing a price stabilization fund¹ to reduce the volatility experienced by individual producers, or (ii) by aggregating supply at the country level to influence prices². These mechanisms allow farmers to mitigate their risk at a relatively low cost (e.g., the cooperative membership fee, contribution to stabilization fund), and have the potential to reach many farmers – aggregated or not. These mechanisms, however, require a critical mass to effectively achieve economies of scale or pool the risk and a well-functioning and transparent organization to aggregate and manage

¹ It should be noted that this is a controversial option and can be very difficult to apply in practice

² It should be noted that this a much discussed, though controversial and not necessarily advisable option which can also be very difficult to implement in practice.

resources (e.g., cooperatives, farmer organizations, government institutions), but these might not be easily available in producer countries. Another trade-off is that farmers do not capture all the upside of price increases (see Section 3.2, page 26).

Reallocating the risk across different actors allows farmers to shift who bears the risk of price volatility to market actors who might be better suited to manage it. These mechanisms include over-the-counter contracts (OTCCs)³ between farmers and farmer groups or intermediaries that allow farmers to protect themselves from price volatility through pre-agreed upon contracts. These mechanisms also include financial derivatives that allow actors up the value chain (e.g., farmer groups, intermediaries, and exporters) to hedge the risk of changing prices by investing in financial derivatives in the stock exchange. These mechanisms allow farmers to transfer the risk to less vulnerable players in the value chain (e.g., farmer groups or intermediaries most commonly, potentially could be exporters as well) and may be implemented at a small scale (e.g., farmer group can offer individual OTCCs to each member farmers. The farmer group would need to hedge its own risk, either by investing in derivatives or signing OTCCs with the subsequent buyer). The mechanism does require coordination by multiple players in the value chain, and intermediate buyer (e.g., farmer group or intermediary) willingness and ability to provide OTCCs. Although this mechanism is being used effectively (see, for example, the Coopetarazu Cooperative and the de Los Andes Cooperative case studies) these mechanisms can be expensive (requiring sufficient quantity bought and sold to work) and complicated to understand and implement effectively (requiring sufficient technical capacity and member outreach to farmers), which often leads to limited uptake from intermediate buyers and farmers.

Coffee value chains in Guatemala and Honduras

This study takes a global view on the PRMMs that could be used in coffee and cocoa, but we also conducted a deeper dive into Guatemala and Honduras to understand, in practice, to what extent, and how, are PRMMs used. The deep dive in Guatemala and Honduras allowed us to look at the specifics of both what PRMMs are already in use, and how to identify gaps and opportunities for other models that may deliver better results or cover more farmers. Many of these insights can be extrapolated to other coffee producing countries, especially high-quality (Arabica or Robusta) producing markets.

The coffee sector in Guatemala is characterized by high quality and low productivity. ANACAFE, the National Coffee Association in Guatemala has successfully positioned the brand of Guatemalan coffee as high quality, as a result, Guatemalan coffee is sold in international markets with a premium on average of \$40 per quintal⁴ above the international reference price. However, more than half of the country's coffee is produced by smallholder farmers who have low productivity. The average yield of a Guatemalan farmer is 19 quintals per hectare, below that of Honduras (22 quintals per hectare) or Colombia (23 quintals per hectare). The low productivity results in high production costs at \$200 per quintal (compared to \$90-\$110 per quintal in

³ Over-the-counter (OTC) trading is done directly between two parties, without the supervision of an exchange. OTC trading, as well as exchange trading occurs with commodities, financial instruments, and derivatives. In OTC, contracts are agreed upon between two parties, who define a specific quantity, quality, and price of the contract.

⁴ Quintal is a unit of weight equal to 100 pounds. It is commonly used in coffee producing countries to measure quantities of coffee.

Honduras). With market prices currently below \$100 per quintal and farmers receiving between 65% and 95% of this price, most Guatemalan farmers are operating at a loss.

In Honduras, the sector is characterized by smallholder production, high productivity, and poor traceability of coffee along the value chain. In Honduras, more than 60% of coffee is produced by smallholder farmers. Coffee production increased at a CAGR of 6.4% between 1997 and 2017 driven by a rise in productivity. This allowed Honduras to become the fifth largest coffee producer in the world. While all the coffee produced is Arabica, Honduran coffee doesn't have a strong reputation in international markets in terms of quality due to poor traceability in the sector. This results in most farmers selling their coffee as commodity at low prices, on average at \$20 below the international reference prices. While production costs are lower than in Guatemala, between \$90 to \$110 per quintal, at current market prices most producers in Honduras also operate at a loss.

In both Guatemala and Honduras intermediaries are powerful players in the market. Intermediaries trade most of the coffee in both countries, 70-80% of coffee in Guatemala and 85% in Honduras. Intermediaries lock in farmers by offering much needed pre-harvest financing, often at relatively high interest rates (because most banks offering market rates won't lend to farmers), with the requirement that farmers sell coffee to them at discounted prices. In 2019, in Guatemala intermediaries bought coffee at around 65% to 72% of export price and in Honduras this percentage was approximately 52%.⁵ In both countries, intermediaries mix all coffee they buy and process it together into parchment. This decreases the traceability of coffee, diminishes the quality (by mixing different levels of quality), and means this coffee is sold at commodity prices in the market. Besides financing, most intermediaries don't offer other services like technical assistance or PRMMs to farmers.

In both countries only a minority of farmers are organized into cooperatives, 20-30% in Guatemala and 15% in Honduras; as a result, most farmers have weak bargaining power with intermediaries, and have less ability to benefit from PRMMs. In both countries, SHFs have little trust in cooperatives because they perceive them as corrupt. Farmers interviewed in Guatemala and Honduras mentioned that there is little transparency on how income is redistributed between co-op members and that the membership rarely results in apparent tangible benefits. Nonetheless, in both countries there are examples of well-functioning cooperatives which offer higher prices to their members and additional support services, as well as access to specialty markets. In Guatemala, farmers selling coffee to co-ops receive about 95% of the export price and in Honduras SHFs receive 65%, above the 52% of export prices offered by intermediaries, respectively. These cooperatives often offer a minimum price guarantee to their members, protecting farmers to some extent from price volatility.

ANACAFE and IHCAFE, the nation-wide farmer associations, have limited budgets and capacity, which limits their ability to effectively offer services to SHFs in Guatemala and Honduras, respectively. Both organizations are financed from farmer contributions and are set up to provide extension services to farmers and advise on coffee policy

⁵ In April 2019 when the report was written, C Contract coffee prices were at \$0.91 per lb.

⁶ This is the price only for farmers selling to intermediaries. In 2018, the average share farmers received in Guatemala was 89% and 73% in Honduras.

for the sector in the case of ANACAFE and conduct R&D in the case of IHCAFE. However, in both countries, the capacity of these institutions to effectively reach all farmers is limited given their current budgets, and therefore, farmers perceive little support from these organizations. In particular, neither ANACAFE or IHCAFE, nor other government institutions, provide PRMMs to unaggregated farmers.

Potential PRMMs to scale and test in Guatemala and Honduras

While most farmers in Guatemala and Honduras lack access to PRMMs and PRMM enablers, we found interesting models worth scaling or replicating; there are also opportunities to test new PRMMs and/or PRMM enablers. Most of these (except for the Sustainable Harvest example below) are not PRMMs per se, but a way of potentially increasing profitability, which can make it possible to make the investments needed to manage price risk effectively. For example, sophisticated farmer groups, like Aruco, COMSA and Cocafelol in Honduras, aggregate farmers producing different levels of quality and different types of coffee producers, which allows them to reap benefits of economies of scale and provide services and benefits to farmers, including more stable prices. A few cooperatives have participated in the Sustainable Harvest price-to-be-fixed program, where cooperatives can purchase options through the Sustainable Harvest account and offer OTCCs to member farmers. Finally, a few farmer groups have also been able to access specialty markets and achieve higher and more stable prices by participating in online auctions. These models can potentially be scaled up by providing technical support and financing to farmer groups.

There are four particularly promising opportunities to improve or provide price risk management for SHFs (or support conditions that make PRMMs more feasible):

- I. **Aggregating production:** SHFs can aggregate production to increase their market power and scale, allowing farmers to reach higher prices, which facilitates creating the conditions conducive to successful implementation of PRMMs. This mechanism would support aggregated farmers with ability to produce differentiated coffees (e.g., Fair Trade, Organic, specialty). It allows farmer groups to achieve economies of scale and therefore reduce individual costs of processing, marketing and selling coffee. In this mechanism, farmer groups buy coffee from members and could offer a stable, and above market farmgate price at the time of the harvest. They could trace each individual lot of coffee throughout the processing stage, and then sells it to international roasters based on the quality and individual specifications. Farmers producing high quality coffee, or who are able to sell their coffee as micro-lots, are paid a premium for their coffee once the coffee has been sold⁷. This mechanism is used by Aruco, COMSA, and Cocafelol and the opportunity lays in scaling and replicating what these groups are already doing successfully. This mechanism requires production of differentiated coffees to enable farmer groups to reach different markets and different prices direct access to premium markets, and well-functioning farmer groups. There are interesting models of farmer aggregation emerging (e.g., IDH, Babban Gona, Guistra, Aldea Global) that may be helpful to explore in these

⁷ Notably, about 1/3 of coffee that should qualify as high-quality or specialty coffee does not receive the expected premium – demonstrating that “premiumization” isn’t a foolproof to improve smallholder livelihoods.

- contexts. Otherwise, these models may have little headroom to be further scaled (see Section 5.1).
2. **OTCCs:** Producers can reduce their experienced price volatility by entering into a range of contract structures, including multi-year OTCCs with downstream value chain buyers (or multi-year offtake agreements). Traditionally, multi-year agreements have been the preserve of exporters or major buyers (who have the capacity and scale of cost effectively hedge their own risk). Here, this mechanism aims to broaden the scope of actors, and to make it possible for major intermediaries that buy directly from cooperatives or producers to offer multi-year OTCCs. ***While it might be more common in differentiated coffee niches, it is also possible to implement OTCCs in the bulk market.*** A potential intervention would be a program providing proof-of-concept for how value chain players can benefit from multi-year OTCCs. The activities would provide a comprehensive service provision package to different actors along the value chain to tackle the key challenges, including limited access to finance for producers and intermediaries, training on how to structure OTCCs and invest in derivatives, and capacity building for intermediate buyers. Donors, multilaterals or government entities could develop blended finance tools or credit guarantee equivalents to increase access to finance to the actors involved in the mechanism (see Section **Error! Reference source not found.**).
 3. **Stabilization fund:** A price stabilization fund could effectively protect most SHFs from price risk, and it is worthwhile if prices are expected to revert to sustainable levels (otherwise it would represent a perpetual subsidy) and if the coffee sector is considered to be strategic for the country (e.g., the livelihoods of a large share of farmers depends on coffee growing, coffee exports are critical for the country's economy, and there aren't alternative crops that could be produced more profitably in a given country context), and therefore it is worth investing public resources in supporting it. A fund with two separate windows could be created to manage price risk and support investments respectively. One window would be a price stabilization fund that pools capital from direct contributions, government resources and grants and subsidizes farmers if prices fall below a certain threshold. The second window (which could be financed by private sector actors and DIFs) would be an investment window that provides financing for projects that increase farmer productivity (e.g., financing investments in R&R, increasing wet-/dry-mill capacity, increased / improved storage capacity, feeder roads, etc.). The purpose of the second window would be to help increase productivity in the sector, and therefore, eventually reduce the price at which producers break even. The stabilization fund could work without the productivity window if there is sufficient access to finance in the market (see Section 5.3).
 4. **Digital marketplaces:** Digital marketplaces can reduce farmers' price volatility and increase their realized farmgate price. This solution would apply for farmers producing high quality coffee, who have access to internet and capacity to process their coffee. The mechanism side-steps stock exchanges, providing an alternative way to link buyers and sellers. These could be set as traditional auctions, reverse auctions, fixed price offerings or fixed price demands based on the specific characteristics of farmers participating (see Section 5.4).

2. INTRODUCTION

The global coffee and cocoa sectors are characterized by smallholder production and significant risks. In 2018, 158.5 million sacks of coffee were produced globally. Of these, 70% were produced by 25 million smallholder farmers (SHFs). Similarly, 90% of the world's cocoa was produced by SHFs. For coffee and cocoa producing countries, most which are low- or middle-income countries, coffee or cocoa exports represent a significant share of exports (e.g., coffee represents 6.9% in Colombia, 13.0% in Honduras, 7.2% in Guatemala in 2018; cocoa represented 50% of exports in Ivory Coast and 10% in Ghana in 2018). However, despite the important role coffee or cocoa plays in these economies, many farmers whose livelihoods depend on coffee or cocoa, live in poverty. This is partly because growing coffee or cocoa is a risky activity. Producers face multiple risks that affect their production, including changing weather patterns, pests, and disease. In addition, market prices are variable, and farmers often bear a large share of the volatility. For example, between 1994 and 2018, international coffee prices moved between a low of \$0.53 per pound and a high of \$2.53 per pound. These changes make the difference between making significant profits and large losses in a given harvest. This creates price risk for farmers (and all actors along the value chain), which means that they are exposed and vulnerable to unexpected and unpredictable changes in the price they receive for their product.

Coffee and cocoa farmers, however, are poorly equipped to manage price risk because they operate with thin margins (or losses), have little access to finance, and have limited capacity to adopt proper price risk management mechanisms⁸ (PRMMs). For example, in 2019, Guatemalan coffee farmers reported production costs to be around \$200 per quintal, while farmgate prices are around \$82. Similarly, in Honduras coffee production costs were estimated to be between \$90-\$110 per quintal. With international reference prices at around \$95 per quintal, farmers receive between \$50-\$65 per quintal, meaning that the average Honduran coffee farmer is operating at a loss⁹. Due to a lack of savings and limited access to finance, most coffee and cocoa farmers have limited capacity to smooth their income in order to cover losses in years characterized by low prices. This exposes farmers to significant income volatility and means farmers are unable and/or have little incentives to make investments in their coffee or cocoa plantations which in turn, affects the industry in terms of a deteriorating outlook for long-term security of supply. Coffee and cocoa production are expected to come under pressure, due to reduced productivity (from sustained underinvestment in plantations) or farmers exiting the sector looking for more viable economic opportunities. Income volatility for farmers may also have unintended consequences such as rural to urban migration or emigration.

This report assesses what is being done in terms of price risk management and what models could potentially reach SHFs at scale. The report focuses on the coffee and cocoa industries at a global level but has a deep dive in two coffee producing countries, Guatemala and Honduras. In the following section we provide an overview of how coffee and cocoa prices are formed, both at the international level and in producer countries. In Section 3 we summarize what mechanisms exist that can help farmers better manage price risk and assess what are the success factors and what market features are necessary to implement these mechanisms. In Section 4 we

⁸ Defined as a set of strategies and practices that minimize the negative impact of drastic changes in the global price of coffee

⁹ Costs of production and prices received estimated by Dalberg based on interviews with SHFs, cooperatives, and experts in Guatemala and Honduras.

present a summary of the coffee market conditions in Guatemala and Honduras and in Section 5 we present what potential price risk management models can best support farmers in these two countries.

It is important to recognize that at the time of the writing of this document, international coffee prices have reached historical lows (e.g., \$91.6 per quintal) and, in some producing countries, including Guatemala and Honduras, production costs are above prices. There is an important distinction between structural price decline and price risk. If prices are fundamentally low, no amount of price risk management will make farmers viable. This report does not focus on addressing structural price decline implications and only focuses on price risk.

How are prices formed in the coffee sector?

The price that coffee farmers face is related to the price that coffee trades for on international exchanges. Coffee prices are formed in the intercontinental commodity exchange (ICE) and are commonly known as the Coffee C Contract for Arabica and Robusta Coffee Futures for Robusta (international reference prices). In most cases, coffee prices defined in the ICE reach farmers producing coffee through the value chain. Roasters and/or importers use the international reference price as a reference to agree on a price with country exporters. Exporters deduce their costs to set a price at which they purchase coffee from intermediaries or farmer groups, which then deduct additional costs to determine prices to farmers. In most cases, once prices reach farmers (i.e., farmgate prices), farmers have little bargaining power. Prices for specialty coffee are generally agreed between buyers (importers or roasters) and the producer or producer organization and tend to be less volatile than the international reference prices set in ICE, although the reference prices are often used as a starting benchmark to price specialty coffee.

International reference prices depend on non-commercial investors and a relatively small number of demand-side actors. International reference prices are based on multiple conditions, including producing country market conditions (supply), but also international demand and non-commercial players like hedge funds. Non-commercial players, like hedge funds or institutional investors, can account for as much as 30% of the open interest in the market.¹⁰ This drives volatility in the short-term as these players are interested in making short-term gains based on short-term market fluctuations that are not necessarily related to the market fundamentals. In the long-term, International reference prices are driven by global supply and demand for coffee. Global supply is highly concentrated, with the biggest players, Brazil and Vietnam, producing more than half of the world's coffee. Demand for coffee is also highly concentrated, with four companies today—ECOM, Louis Dreyfus, Neumann, and Volcafe—controlling about 40% of all global coffee

¹⁰ Open interest is the total number of open or outstanding options and/or futures contracts that exist at a given time, meaning these are the positions created by traders that are not backed by physical trading but hold implications for the commodities' price.

trade.¹¹ Other sources cite OLAM¹², Volcafe and Sucafina¹³ as industry leaders in buying coffee. This gives a few players, on the demand side, and the two major supplying countries – Brazil and Vietnam - an outsized influence in setting coffee prices at the international level.

Within a producing country, value chain characteristics define the share of export prices that farmers receive; three main factors determine this: (1) supply chain efficiency, (2) farmer aggregation, and (3) quality of coffee.

- **Supply chain efficiency:** The costs incurred between moving coffee in cherries from the farm to green beans to be exported depend on how efficient the supply chain is. This depends on (i) the competitiveness of the supply chain, (ii) the number and efficiency of intermediaries, and (iii) the quality of the logistics infrastructure. Limited government intervention and competitive markets increase the efficiency of the supply chain, reducing overall costs along it. In Vietnam, for example, competition between local and international exporters has driven an increase in value chain efficiency, reducing exporters' margins, and reducing value chain costs to just 5% of export costs. In contrast, supply chain costs eat up 39% of Ethiopia's export price (see Figure 1), leaving just 61% for farmers. In countries with fewer number of intermediaries along the value chain, costs are typically lower, and farmers tend to receive higher prices. For example, in Colombia there are few intermediaries along the value chain, allowing farmers to get 85% of export price. In this case, most farmers sell to local cooperatives, who generally sell directly either to Fedecafe (the biggest exporter in the country), other exporters, or directly to buyers, cutting most intermediaries out of the value chain¹⁴. In countries with poor logistics infrastructure (e.g., poor roads, warehouses, port logistics) and high export costs (e.g., driven by high operator fees, fuel costs, packaging ability, customs processes and costs), and less processing capacity (to pulp cherries) farmers tend to receive a smaller share of the export price. An example of this is Rwanda, where farmers receive 69% of export FOB prices as a result of poor quality of feeder roads and high costs of exporting compared to other countries in the region.
- **Farmer aggregation:** In countries a higher share of aggregated farmers, farmer groups are often able to negotiate better prices with buyers and to remove intermediaries in the value chain, increasing the share of prices farmers receive. In Costa Rica, for example, farmer aggregation contributes to farmers receiving a large share of the export price (92%)¹⁵.
- **Quality of coffee:** Higher quality grades of coffee can often (but not always) attract higher prices. Given that supply chain costs such as logistics are often the same regardless of the final

¹¹ This was the market situation as of 2012; the proportion is expected to have remained largely unchanged in subsequent years. Source: "The Global Coffee Commodity Chain," Socio Studies (2017); ICO (2018); International Trade Center (2018).

¹² Industry expert

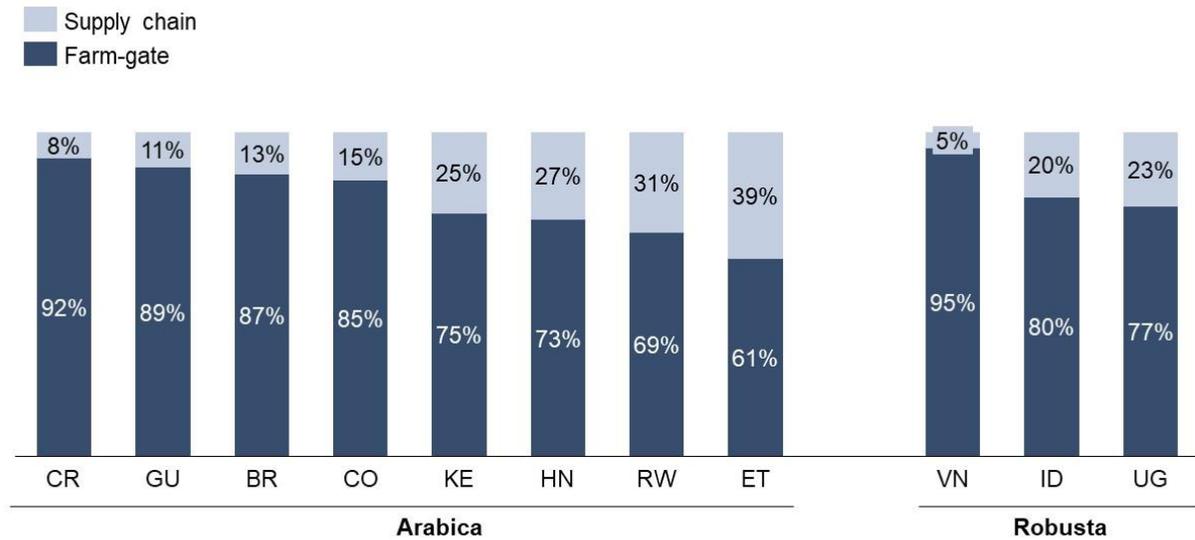
¹³ Coffee Barometer, 2018. According to Coffee Barometer, the dominant companies are privately held and are not required to share their data, making it hard to estimate their size and influence.

¹⁴ However, this report did not assess whether or not this may be largely due to more coffee farmers operating at a large scale of production (or if Colombian farmers are in fact largely smallholder farmers).

¹⁵ In the case of Costa Rica, high quality of coffee, traceability in the value chain and government regulation, which requires buyers to bear most of the downward price volatility risk, all contribute to the high share of export prices farmers receive.

price achieved, this results in farmers achieving premium prices for higher quality coffee realizing a higher share of export prices. For example, in Guatemala, the high quality of the coffee produced (and the premium this demands) is a major factor in the large share (89%) of export prices farmers are able to keep.

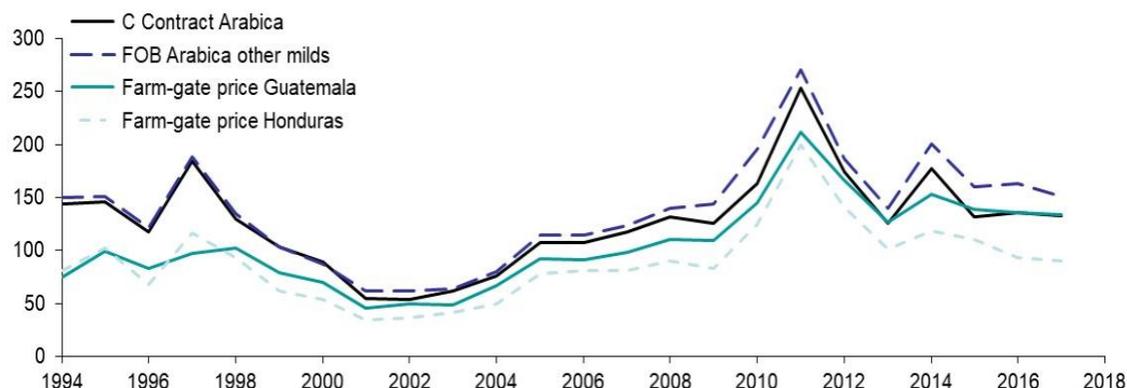
Figure 1. Share of farmgate price and supply chain costs (percentage of export price)



Source: ICO and Global Coffee Platform, 2017

The price volatility that farmers experience is mostly driven by the volatility in the international reference price for Arabica and Robusta, rather than the value chain conditions in country. It is important to understand farmers’ share of export prices – which are very much affected by the value chain conditions – versus farmers’ experienced price volatility, which is mostly shaped by the prevailing export prices that can be achieved. Changes in the international reference price are closely correlated to changes in export prices, which then lead to changes in farmgate prices. For example, between 1994 and 2017, the average price for Arabica other milds (i.e., the average export price for countries producing Arabica coffee, including Guatemala and Honduras) had a correlation of 0.98 with the C Contract price for Arabica. Similarly, farmgate prices in Guatemala had a correlation of 0.87 with C Contract for Arabica price during that period; the correlation with farmgate prices in Honduras was 0.96 (see Figure 2). The higher quality of Guatemalan coffee partly explains why the correlation of the farmgate prices with C Contract price is lower compared to Honduras.

Figure 2. New York C Contract, export, and farmgate prices (USD cents per pound, 1994 - 2017)^{16 17}



Source: ICO and ICE, 2019

The volatility in C contract future prices for Arabica and future prices for Robusta creates price risk for all players along the value chain; actors in the value chain use different methodologies to hedge this risk. Because volatility in international reference prices, for both Arabica and Robusta, trickles down to farmgate prices, and all prices in between, all actors along the value chain are exposed to price risk. There are different mechanisms to protect actors against price volatility. However, smallholder farmers are generally poorly equipped to manage price risk because they operate with thin margins (or at losses) and have little access to finance, which diminishes their capacity to smooth income across time. In addition, most of the existing models for price risk management are either too expensive, complex, or unknown for farmers. The next section of this document provides an overview of existing price risk management mechanisms (PRMMs) used in the coffee and cocoa value chains across the world, the trade-offs between the different mechanisms, and key success factors and supply chain requirements for the implementation of these. We placed specific emphasis on mechanisms that can reach smallholder farmers.

How are prices formed in the cocoa sector?

Prices in the cocoa sector are formed in a similar way as the coffee sector. Cocoa future contracts traded in the ICE in New York and the London Financial Futures and Options Exchange (LIFFE) are used as reference international prices for the industry worldwide. Cocoa from Malaysia and Indonesia are priced at a par with the ICE market, while cocoas from West Africa, Western Samoa, Trinidad and Tobago, Grenada and Jamaica are priced at a par with the LIFFE futures

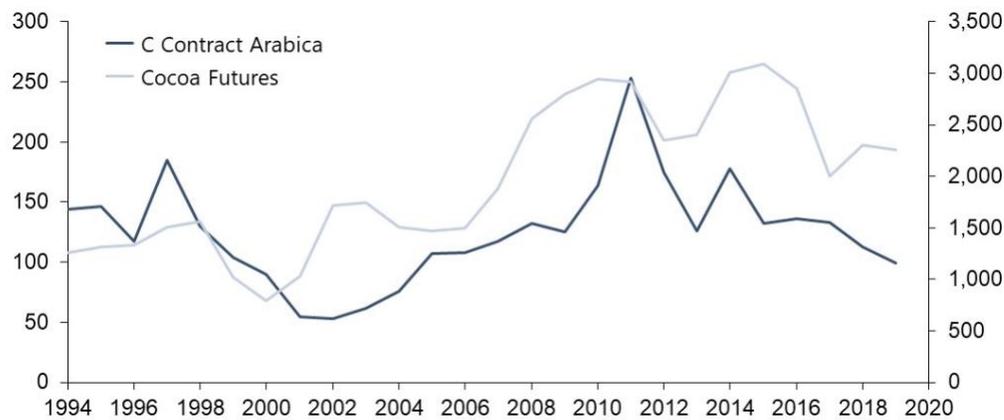
¹⁶ The graph shows prices for Arabica to illustrate how different prices in the value chain are related to one another. Robusta prices are also closely linked to each other. For example, between May 2014 and June 2018, the correlation between the Robusta Coffee Contract prices and the average export FOB price was 0.95.

¹⁷ The FOB export arabica milds price is the average price for countries producing arabica (excluding Colombia) at all ports where it is traded.

market. As in coffee, these prices are used as a reference for exporters or governments in producing countries to determine farmgate prices.¹⁸

Future cocoa prices depend on non-commercial investors and a small number of supply- and demand-side players. As in coffee, non-commercial players, like hedge funds or institutional investors play an important role in setting futures prices. On the supply side, 62% of the world's cocoa production is concentrated in Ghana and Ivory Coast.¹⁹ This means that any significant changes in the harvest in one of these two countries, will have a large effect on the global cocoa supply, and therefore, on international prices. On the demand side, three multinationals – Callebaut, Olam and Cargill – account for two thirds of the world's grinding and processing, played a large role in the market.²⁰ Cocoa international reference prices have similar volatility as coffee international reference prices, and over the past two decades have moved closely together.

Figure 3. New York C Contract (\$ / lbs) and cocoa futures (\$ / metric ton)



Source: Intercontinental Commodities Exchange

In the cocoa sector, the share of export prices farmers receive depends on local market conditions and regulation. In both Ghana and Ivory Coast, the cocoa market is heavily regulated and farmgate prices are determined by the government. In Ghana for example, the Ghana Cocoa Board (COCOBOD) regulates farmgate prices by using a stabilization fund (see **Box 5**). COCOBOD determines the farmgate prices based on the export price, which is determined based on the future contracts traded at LIFFE. Similarly, in Ivory Coast the Conseil Café Cocoa (CCC) sets farmgate prices annually based on quality and export prices. In both countries, the regulation has helped reduce the price volatility experienced by farmers but farmgate prices are lower than those in Indonesia, where the market is liberalized²¹.

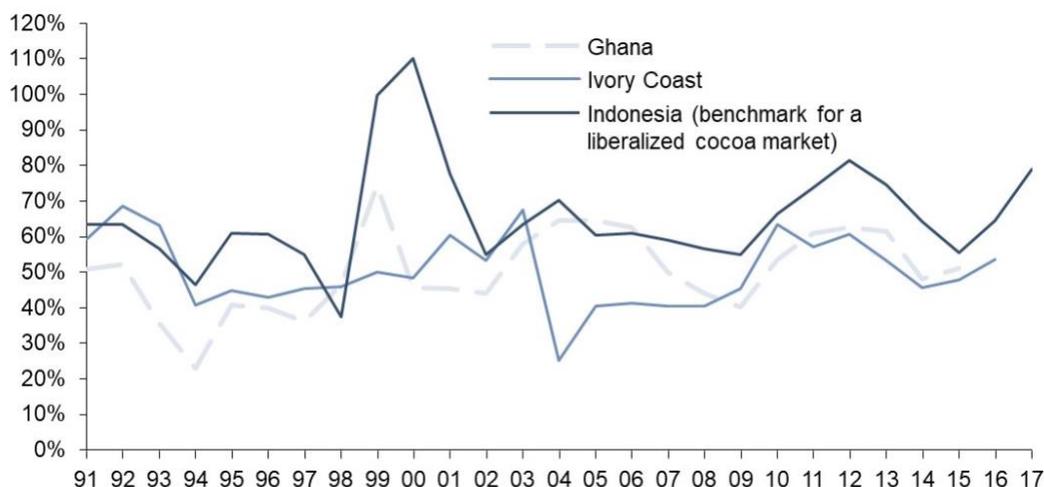
¹⁸ International Cocoa Organization (ICCO) (2010). “Functioning and Transparency of the Terminal Markets for Cocoa. An Analysis and Overview of Recent Events on the London Terminal Market”, September 2010.

¹⁹ FAO, “FAOSTAT”, 2018

²⁰ Fair Afric

²¹ Although this was not explored in this paper, this outcome is likely due to less efficient market conditions.

Figure 4. Annual cocoa farmgate price in Ghana, Ivory Coast and Indonesia as a percentage of the average world market price, 1991-2017²²



Source: FAO

3. PRICE RISK MANAGEMENT MECHANISMS

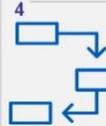
3.1. PRICE RISK MANAGEMENT MECHANISMS

Given that volatility in international reference prices affects players across the entire value chain, all actors need to understand, measure and mitigate their risk. Actors along the coffee and cocoa value chains use different strategies or mechanisms to manage their price risk; we refer to these mechanisms as price risk management mechanisms or PRMMs. While the PRMMs described in the section were collected by assessing the mechanisms used to manage price risk in the coffee and cocoa value chains, these could potentially be used in other commodity or agricultural markets that have similar supply chain characteristics.

There are four main categories of PRMMs and PRMM enablers used in the coffee sector, which aim to address price risk in different ways (Figure 5). These include strategies that partially decouple pricing from the commodity exchanges and those which keep pricing pegged to the ICE but implement methods to manage it by (i) increasing the flexibility of when to sell coffee, (ii) aggregating resources across actors to increase profitability of coffee for smallholder farmers, making them more resilient to price shocks, and (iii) reallocating risk across actors in the value chain.

²² Although this was not assessed in this paper, exploration of when COCOBOD and CCC started setting prices in connection with this graph, might provide insight into the impact of these policies on the market prices and world markets.

Figure 5. Categories of Price Risk Management and PRM Enabler Models^{23,24}

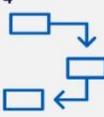
CATEGORY	DEFINITION	
<p>1</p>  <p>Partially decouple pricing from commodity exchanges</p>	<p>Implementing a price discovery mechanism partially independent from the ICE allows actors in the value chain to determine prices based on specific characteristics of the coffee and its production. This can potentially lead to higher and more stable prices because prices will depend on local market fundamentals (e.g., cost of production) and not on non-commercial traders.</p>	
<p>Pricing pegged to ICE but also...</p>	<p>2</p>  <p>Increase flexibility of when to sell coffee</p>	<p>Managing the moment in time when coffee is sold to reduce the negative effects of price volatility. These mechanisms involve separating the time between the harvest and the sale, for example, by storing the coffee in a warehouse. This enables farmers to sell coffee when prices are beneficial.</p>
	<p>3</p>  <p>Aggregate resources across market actors</p>	<p>Aggregating resources across actors in the market can help reduce the experienced price volatility of producers. These mechanisms focus on aggregating financial and physical resources between different players in the value chain or across the country to spread risks evenly among a large number of people, and thus reduce the experienced volatility of individual producers.</p>
	<p>4</p>  <p>Reallocate risk across actors in the value chain</p>	<p>Reallocating risk across different actors using financial mechanisms and contracts. These mechanisms leverage financial markets, over the counter financial mechanisms, and contracts to shift who bears the burden of the risk of price volatility.</p>

Among these four categories, there are trade-offs between the potential impact of the PRMMs and PRMM Enablers and the requirements that need to be met to implement them effectively (Figure 6).

²³ Regarding the first model, it should be noted that specialty coffee is already more loosely tied to commodity exchange prices.

²⁴ In some of the examples under Category 3, activities do not actually reduce the experienced price volatility, but rather increase the overall profitability of farmers, thus making the impact of price volatility less severe. In some examples, rather than spreading risks, activities are actually taking advantage of economies of scale, thus increasing profitability and making smallholder farmers less vulnerable to price volatility.

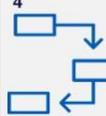
Figure 6. Advantages and disadvantages of the four PRMM and PRMM enabler categories²⁵

	CATEGORY	PROS	CONS
	<p>1  Partially decouple pricing from commodity exchanges</p>	<p>Prices would depend more directly on market fundamentals and coffee characteristics. This makes prices easier to predict for farmers and to reduce volatility because there are no speculative investors</p>	<p>Suitable for specialty coffee because commodity coffee is already priced through ICE and buyers wouldn't have incentives to use an alternative platform to buy commodity coffee. However, even if only for specialty coffee, the platform still requires achieving scale to be financially viable</p>
Pricing pegged to ICE but also...	<p>2  Increase flexibility of when to sell coffee</p>	<p>Farmers reap benefits of market upswings without large investments beyond the opportunity cost of selling produce quickly</p>	<p>Doesn't work if prices continually fall (or fall for an extended period of time) or producers do not have access to cashflow to cover short-term opportunity costs, processing capacity or infrastructure to store coffee</p>
	<p>3  Aggregate resources across market actors</p>	<p>Reduces experienced volatility for producers at a low cost (e.g., membership to the coop, contribution to fund) and has potential to reach a large number of farmers</p>	<p>Requires a well-functioning, transparent organization to pool and manage resources (e.g., coops, govt.). These might not be easily available in producer countries</p>
	<p>4  Reallocate risk across actors in the value chain</p>	<p>Transfers risk from farmers to less vulnerable players in the VC, and does not require a critical mass to work as with pooling risk or decoupling from commodity exchanges</p>	<p>Requires coordination by multiple players in the VC, and intermediate buyer willingness and ability to provide OTCCs. Requires investing in derivatives, which is expensive, difficult to understand and implement</p>

Within each category there are several PRMMs or PRM enablers which differ based on which market player takes the lead on the activity, how they manage price risk, and therefore what requirements are necessary to implement them (Figure 7). Section 3.3 highlights the most prevalent PRMMs in each category, how they work, what are the key requirements, and examples of these. Section 3.4 summarizes when specific PRMMs or PRMM enablers are more suitable and what is the potential impact of each.

²⁵ Note in Category 3, that some examples do not in fact reduce experienced volatility, but rather increase profitability, therefore mitigating the overall impact of price volatility.

Figure 7. PRMM or PRMM enabler in each category by lead actor type²⁶

CATEGORY	PRODUCERS	SUPPLY CHAIN ACTORS	SUPPORT ACTORS
1  Partially decouple pricing from commodity exchanges		1.1. Independent market places	
Pricing pegged to ICE but also...	2  Increase flexibility of when to sell coffee	2.1 Warehouse receipt systems	
	3  Aggregate resources across market actors	3.1. Risk pool of producers	3.2. Price stabilization
			3.3. Supply stabilization
	4  Reallocate risk across actors in the value chain		4.1. Over the counter contracts

In addition, there are a set of strategies - much like the PRMM enablers noted previously - that focus on increasing farmer resilience by strengthening their capabilities and increasing their capacity to effectively adopt PRMMs. These strategies are not strictly PRMMs because they don't focus on reducing the experienced price volatility, rather, these are aimed at increasing farmers' capacity to cope with price volatility. These strategies include those aimed at increasing the price received by farmers (e.g., processing coffee or increasing the quality of coffee), increasing productivity (e.g., investing in renovation and rehabilitation, fertilization or mechanization), and increasing access to support services (e.g., financial services, farmer aggregation). These strategies are often complementary to PRMMs because the objective to 'smooth' price fluctuations can be more easily achieved if (i) value chain actors have access to the capital required to cover the upfront investment needed to implement PRMMs and / or operating costs, (ii) farmers are members of cooperatives or farmer groups, which allows to reduce the costs of adopting PRMMs, or (iii) information asymmetries between producers and downstream value chain actors are reduced sufficiently to incentivize increased collaboration and risk sharing. While these mechanisms are important for SHFs and complimentary to PRMMs, they are not discussed in depth in this document.

²⁶ Under Category 3, 3.1, rather than pooling risk, these examples in fact involve trading in sufficiently large quantities to ensure that farmers are able to take advantage of economies of scale.

3.2. DESCRIPTION OF PRMS AND PRM ENABLERS

CATEGORY I: PARTIALLY DECOUPLE PRICING FROM COMMODITY EXCHANGES

Mechanism 1.1: Independent marketplaces

How it works

Independent marketplaces allow producers to partially decouple the pricing of their product from commodity exchanges. Independent marketplaces allow prices to be locally determined based on cost and the specific characteristics of the coffee by connecting producers (or producer groups) to buyers (including importers and roasters).. In any case, however, prices will also depend to some extent on the tradable price (i.e., the price at which coffee is exported). The tradable price in most cases will be the international reference price determined in ICE, except in Brazil and Ethiopia, where there is a significant domestic consumption of the coffee crop, in which case the coffee sold in the domestic market doesn't need to be related to the international price. The mechanism does allow to partially decouple prices from the commodity exchanges because there is limited ability to price differentiated coffee lots properly, and therefore, buyers apply the commodity price (sometimes adding a premium for quality) to most coffee. Independent market places would allow to effectively trade coffee based on its individual characteristics and production costs. These mechanisms are mostly used for specialty coffees, in which case buyers make offers based on the specific characteristics of the coffee and how much it can be sold for once roaster, and not fully based on the international reference prices set at ICE. These mechanisms are typically set up by governments (e.g., Ethiopia Commodity Exchange), national coffee associations (e.g., the African Fine Coffees Association online auctions, see **Error! Reference source not found.**), or private actors (e.g., Algrano online platform).

These prices are likely to be more stable because non-commercial traders do not participate in the market, removing the short-term volatility caused by speculative investments. Prices achieved may also be higher if they are structured in a way that gives farmers more bargaining power by removing intermediaries in the market and allowing farmers to reach more buyers, who will compete for the coffee in the marketplace.

In addition, the digital marketplaces can provide several other services. Digital marketplaces can sponsor **quality competitions** that showcase the quality of the coffee produced by smallholder farmers on the platform to help high-performing farmers increase the visibility of and demand for their product. To date, competitions have been sponsored by governments, donors and NGOs. Once a region or country has become well known for its coffee and there are sufficient buyers, farmer groups could potentially bear the costs of organizing competitions as a marketing and selling mechanism. In Honduras for example, in 2019 farmers were able to sell their coffee at between 5-10 times the local farmgate price through quality

competitions, and therefore to effectively protect themselves from the low prices²⁷. Digital platforms also enable farmers to access **digital financial services** (DFS) to receive payments for their sales or to apply for financing. Platforms can also be leveraged to disseminate **relevant information** to farmers, such as weather forecasts, best agricultural practices, foreign exchange rates, and tracking of prices and sales quantities.

Independent marketplaces have several requirements and may therefore be expensive to implement. However, these mechanisms have been in the past established by private companies at a profit by providing a good quality and valuable service that incentivizes participants to pay a fee in exchange for reducing other costs incurred (e.g., search costs for specialty coffee for buyers)

Key success factors

Producers and buyers need access to a system that guarantees transparent and efficient transactions. The platform must achieve a large number of buyers and sellers and a sufficiently large quantity of coffee traded in the marketplace so it is attractive for participants. Furthermore, it must have efficient processes that enable easy transactions, especially when bridging transactions between producers – who commonly lack expertise selling their coffee directly to importers, and players higher up the value chain – who commonly do not negotiate directly with farmers.

Farmers must have access to processing facilities or capacity to process coffee to make it export-ready. Most smallholder farmers lack capacity and expertise processing coffee from cherries to parchment and then to green coffee, which is the state it needs to be for export. Having access to a facility, or being able to process their coffee themselves, will be key to ensure farmers can deliver on agreements.

Farmers need to have the skills and resources needed to participate in the marketplace. For example, if the marketplace is digital, farmers must have access to internet to be able trade their coffee and digital skills to effectively use the platform. For quality competitions that are in person, farmers must be able to go to the competitions in person and bring samples of their coffee, as well as ability present and sell their coffee to international buyers (i.e., negotiation and presentation skills).

Access to financial services is required to ensure farmers do not side-sell and are able to receive their payment directly. If the producer and the buyer are not physically located in the same place (i.e., digital marketplaces), full payment for the coffee may not be immediate at the time of harvest, but upon delivery of the coffee in the location of the buyer. This may create incentives for producers to side-sell their coffee, even after an agreement with a buyer has been made, due to an urgent need for liquidity. This means that farmers may need access to financing for working capital that enables them to produce high quality coffee and not be tempted to side-sell. For example, Cafico in Honduras provides pre-harvest financing to farmers, as well as technical support, which incentivizes farmers to stay within the group and sell the agreed upon coffee to Cafico. Given that few SHFs are considered bankable by commercial financial institutions,

²⁷ It should be reiterated, however, that a significant portion – about one-third of certified coffee – does not receive the expected premium, so premiumization is by no means foolproof.

accessing finance may require the presence of social lenders (e.g., Root Capital, Oikocredit), or farmers to belong to cooperatives that provide lending. After negotiations, farmers will also need access to formal financial services to receive payments from buyers.

Strong accountability is crucial to ensure contracts are fulfilled. Accountability mechanisms should help ensure that farmers deliver the agreed volumes and qualities, within the agreed timelines; and buyers are paying producers fair prices and disbursing payments at the agreed time. Contracts should include clear tailored clauses for both parties and ensure there are sensible compliance clauses for both parties (e.g., guarantee buyers can access similar coffees through the platform in case the original farmer does not deliver, guarantee farmers are receiving full payments and support them with access to finance and conflict resolution in case buyers default).

Box 1. Independent marketplaces case study: African Fine Coffees Association's online auctions

HOW IT WORKS

The African Fine Coffees Association's (AFCA) online auctions connect specialty coffee producers with international buyers, helping sidestep ICE's volatility and increase farmers' realized prices. In 2016 and 2017, pilot auctions were held in several African countries involving 13 active international bidders for lots put up for sale by 18 cooperatives. More than 16,200 kilograms of coffee were sold for around \$110,000. Participating producers received higher prices. For example, Swiss buyers purchased a taste-competition-winning coffee called "ToH" from Tanzania at prices 58% to 108% above farmgate market prices. In November 2017 AFCA auctioned coffee from Zambia and Malawi, with sales reaching a 160% premium above farmgate market prices.

Building on the initial pilots, AFCA is now holding tasting competitions and auctions around Africa. The success has led AFCA to replicate this model in other countries, such as the Democratic Republic of the Congo, Kenya and Uganda.

KEY SUCCESS FACTORS

- **Bridging the gap between buyers and farmers.** AFCA has used its convening power, to bring more buyers closer to farmers, getting them interested in their coffee. For example, in 2013 AFCA brought international attention to Rwanda, with the first-ever "Cup of Excellence" held in Kigali. The following year AFCA did the same in Burundi, with a conference that brought almost 700 international buyers and coffee experts to the country.
- **Training to farmers, processors and traders to help ensure coffee quality is high and negotiations are effective.** AFCA provides constant trainings to stakeholders on coffee quality, grading and negotiations. This helps ensure that farmers using their platform can effectively trade their coffee through it. It has also helped AFCA increase the availability of high-quality coffee in target countries.
- **Strong ICT infrastructure** enables the creation of an effective platform to increase the number of sellers and the accessibility to the platform
- **AFCA's membership organization and for-profit nature** has allowed it to raised resources to invest in these services for its members. AFCA is finance through membership fees

Box 2. Independent Marketplaces Case Study: Algrano.com

HOW IT WORKS

Algrano.com is an online platform where producers can sell their high-quality coffee directly to roasters. Algrano was created in 2015 in Switzerland with the objective of bringing coffee farmers and roasters closer together. Producers register on the platform and share samples of their coffee for six weeks in an online container. Roasters within the reach of the selected port (European ports) can ask for samples, review the coffees and place their orders within the container. Once a roaster agrees to buy a coffee, Algrano buys the coffee from farmers and ships it to the roasters, who pay Algrano against shipping documents. By grouping roasters' orders, Algrano is able to overcome the challenges of trading small quantities of coffees directly. Algrano Not only provides the platform to connect growers and roasters, it also provides all the services required to transport the coffee from the grower to the roaster. These services include shipping, financing, warehousing and quality management. Algrano has built a customizable supply chain for roasters, where roasters are able to know the exact costs of each of the services provided by Algrano. For example, if a roaster orders coffee from green bean traders, the coffee will already be stored in a warehouse; Algrano will charge for the months the coffee was stored in the warehouse and the shipping costs.

Algrano started with a small pilot of Nicaraguan coffee growers and a few roasters in Switzerland and Germany. To date, Algrano has signed 527 European roasters, 563 producers in and 74 cooperatives in 6 producing countries. Algrano offers its services at a fixed cost, which means that every additional dollar a roaster is willing to pay goes back to the producer. In 2017, Algrano paid 30 per cent more to growers than they could have achieved at the highest market price for the period. In addition, Algrano has raised capital to finance the launch and expansion. In 2015, Algrano was selected for the Startup Brazil program, which provided seed capital to develop the platform. In 2019, raised more than \$2 million to finance its expansion strategy.

KEY SUCCESS FACTORS

- **Traceability of coffee and costs along the value chain.** Algrano has created a system that allows it to trace coffee from the farmer to the roaster and track the costs along the process. This enables Algrano to ensure the quality of the coffee and guarantee that the coffee roasters sampled and bought is the same as the coffee delivered. It also allows Algrano to charge for the specific services each roaster incurs to receive the coffee, and therefore offer a customizable value chain to each roaster.
- **Partnerships with other players in the value chain.** Algrano is able to offer storage, shipping and financial services to its customers by partnering with other organizations, including warehouses and exporters.

CATEGORY 2: INCREASE FLEXIBILITY OF WHEN TO SELL COFFEE

Mechanism 2.1: Warehouse receipt systems

How it works

Warehouse receipt systems provide farmers flexibility to separate the time of the harvest from the time they sell their coffee. At the time of the harvest, farmers can process and store their coffee – or parts of it – and decide when to sell (i.e., during times with favorable prices). By separating the time of harvest and sale, this mechanism allows farmers to benefit from price upswings and potentially protect themselves from low prices. When farmers store their coffee, they receive a receipt that states the amount and quality of coffee delivered. The receipt should act as a guarantee for the farmer that the coffee will be safely stored and traced through processing (if applicable) to ensure that the quality is not compromised while it is stored. In some countries, the receipt can be used as a guarantee to access financing. This model could be led by a variety of different players. Most warehousing systems are operated by private sector actors (e.g., Tanzania’s warehousing system, see Box 3), but government and NGOs often operate these types of models as well.

Key success factors

Prices need to be volatile in the short- or medium-term for this mechanism to work. If prices fall for an extended period of time, farmers will continue to store coffee, eventually being forced to sell it a low price. Moreover, coffee in parchment cannot be stored for too long; depending on the humidity levels and temperature it can be stored between 6 months and 3 years. Even if prices are high, if they are broadly stable there is no reason to use this model.

Capacity or access to process coffee into parchment. Coffee can only be stored once it has been processed into parchment because cherries rot after about 24 hours. Thus, farmers must have the capacity in house, or access to facilities to wet and dry mill their coffee.

Access to finance is needed to cover farmers’ financial obligations while farmers sell their coffee. Farmers must have access to loans to cover their expenses, including working capital and investment capital to maintain coffee production and, if coffee is their only source of income, financing to cover living expenses. Interest rates cannot be too high that they hamper the mechanism’s business case (i.e., interest payments are above the additional profits gained from selling coffee at a higher price). Another key success factor is to successfully use warehouse receipts to access finance. For this to happen, an enabling legal and regulatory environment is required, where movable collateral (and within this, warehouse receipts) is broadly accepted by financial institutions as a form of collateral. The World Bank’s Enabling Business of Agriculture (EBA) indicator assess the legal and regulatory environment of developing countries for warehouse receipts and movable collateral. Coffee and cocoa producing countries, including Colombia, Ethiopia, Mexico, Peru, Uganda, Tanzania and Ivory Coast, have scored high on the EBA warehouse receipts and movable collateral indicator.

Finally, access to a warehouse with appropriate conditions to preserve coffee and accountability tools is key. Warehouses should be close to farmers and offer to store coffee at reasonable prices. The warehouse should have the capacity to differentiate coffee by quality, so

Box 3. Increase flexibility of when to sell coffee case study: Tanzania's warehousing system

HOW IT WORKS

Tanzania's warehousing networks is one of the most developed in Africa. Coffee SHFs commonly access this network through their cooperatives or farmer groups. The coffee is deposited with a coffee factory licensed by the Tanzania Warehouse Licensing Board (TWLB). The licensed warehouse operators process to parchment and store it for farmers or auction it off for them.

Farmers selling through this system often receive an initial payment which is about 60% of the farmgate price offered by private traders for parchment. This helps alleviate their liquidity needs. After the coffee is sold, farmers receive additional payments that represents the actual value for which their coffee was sold at, minus any processing fees incurred. Farmers can also access financing through the system by using the coffee stored as collateral. If at the time of the harvest the price is below the amount paid initially, farmers can store their coffee and sell when prices increase, or they can pay back the difference to the warehouse. However, prices rarely drop more than 60% in a given year, so this is unlikely to happen.

KEY SUCCESS FACTORS

Enforcing mechanisms that ensure the widespread recognition of warehouse receipts. This helps ensure farmers that their coffee is safe and that they can access finance, to reduce any urgency for liquidity. For example, in Tanzania to guarantee access to finance the government created legislation to govern warehouses, which has recognized 28 warehouses in the country, officially. This has increased everyone's credibility in warehouses, including banks who now accept warehouse receipts as collateral for loans. **Farmers with deep knowledge of their financials.** This allows farmers to sell when the price is above their breakeven point. If farmers, or their farmer groups, do not know this information, the model becomes speculative and manages little risk.

when the farmer decides to sell the coffee, he is ensured that he is getting his coffee or same quality coffee. Warehouses are generally liable for any loss of product while stored in the warehouse.

CATEGORY 3: AGGREGATING RESOURCES WITH OTHER MARKET ACTORS

Mechanism 3.1: Aggregating producers

How it works

A capable and well-connected farmer group can offer generally higher prices to associated farmers by aggregating quantities across multiple members. A farmer group can aggregate coffee and divide it into different qualities and types (e.g., UTZ certified, Fair Trade), and store it. The farmer group defines either a fixed price (above market prices) or minimum

price to pay all farmers upon delivery of coffee. The group negotiates directly with buyers based on the qualities and types of coffees it receives. After selling, the farmer group pays back a share of the premium (discounting margins, intermediation and marketing costs, etc.) to farmers who produced high-quality coffee to incentivize farmers to continue investing in quality.

Producers' profits are increased by achieving economies of scale. Reaching scale enables the group to reduce the cost of processing, marketing and selling each pound of coffee. The reduction in costs can enable the group to offer all members an average price that is higher than market prices.

Key success factors

Direct access to markets, both commodity and specialty to ensure the group is able to sell all coffee purchased. Access to premium markets is particularly important to maximize the share of coffee sold at premium prices to increase the group's margins. This requires a strong marketing arm, with the capacity to find and negotiate with buyers that are willing to pay high-quality premiums; including negotiating with people from different cultures and countries around the world. It may also require providing training and inputs to farmers to support farmers improve the quality of their coffee.

Well-functioning farmer groups that are transparent, efficient, and farmer-centric. In the absence of them, SHFs will have few incentives to join producer groups, making this mechanism unfeasible because it requires reaching a certain critical mass. The group needs to be efficiently managed to ensure that their own margins are maximized, that profits are invested into the group, and that it is not taking too much risk - for example, by setting a price to farmers that is too high to cover. In addition, increasing farmer equity in co-ops could incentivize more farmers to join co-ops, as they could receive more benefits from the group.

Access to finance for farmer groups. Farmer groups may need access to finance to make investments needed for the mechanism to work effectively. For example, to invest in certifications for members, training on coffee tasting to improve quality, to improve processing capacity, or for marketing purposes. In addition, farmers often require pre-harvest financing to cover their working capital needs. The farmer group can offer access to financing to farmers to avoid side-selling to intermediaries who are the most common source of finance for SHFs. Side-selling can

lead to groups defaulting in negotiations and putting the entire group at risk. To mitigate this, groups can provide farmers loans or advancements for coffee upon delivery.

Box 4. Risk pool of producers' case study: ACODIHUE's pricing mechanism

HOW IT WORKS

ACODIHUE is a second-tier cooperative in Guatemala . ACODIHUE focuses on selling specialized coffees (e.g., women certified, organic, youth produced). These different coffees can be sold in different markets.. ACODIHUE sells coffee, averages a uniform price per pound and pays farmers back this uniform price, for every pound they delivered. Once the coffee has been sold and exported, farmers producing high-quality coffee receive a premium in addition of the payment received at delivery.

ACODIHUE supports ~1,500 farmers achieve more stable and above market prices. For example, in 2019 ACODIHUE members received on average USD 40 more per quintal compared to farmgate market prices offered by intermediaries.

KEY SUCCESS FACTORS

ACODIHUE's capacity to commercialize differentiated coffees is key, including a close traceability of different coffees, their producers, and their certifications.

Mechanism 3.2: Price stabilization

How it works

Setting a fixed price or a minimum price level cancels the effect of large drops in market prices. This mechanism pools risk from one point in time to another, to stabilize the overall price for farmers. Prices of commodities can be stabilized either by setting price floors through regulation, certifications (some certifications provide price floors, such as Fair Trade) or stabilization funds, raised to cover the differential when prices fall below a minimum threshold. These mechanisms commonly work by (i) charging end consumers a higher price by differentiating their brand and/or (ii) subsidies provided by government or support institutions. This ensures that smallholder farmers can plan for and receive a minimum price. These mechanisms can become unsustainable, or entail a permanent subsidy, if international market prices are at low levels for a prolonged time. This can also distort markets – providing incentives for smallholders to stay in coffee even if it isn't profitable – and discouraging them from shifting to crops that may be more profitable. This can also divert scarce government resources away from more productive uses, particularly if years with high coffee prices don't raise sufficient funds to cover years with low coffee prices.

Government capacity to structure and manage the fund in a way that it does not become a permanent, annual subsidy. If government has the capacity to use these tools successfully, this could be achieved through effective use of financial hedging instruments.

Key success factors

Price stabilization requires a strong government or sector association able to effectively implement price floors or manage stabilization funds. For price floors, the institution that manages the price floor (most likely a government institution) should have enough power to enforce and deliver on the price floor. For example, a few years ago in Honduras IHCAFE, the National Coffee Institute, tried to suggest an ideal minimum price. They announced the minimum price on the radio and 30 minutes later, the exporters came back and offered their minimum price, below the price announced by IHCAFE and in line with international market prices. Because IHCAFE does not have the capacity to buy coffee, or to effectively ensure that intermediaries are paying the minimum price established, the price floor immediately became irrelevant. For stabilization funds, the institution managing the fund should be able to collect the contributions for the fund efficiently, ensure the funds are invested somewhere they can be disbursed quickly if prices drop below the established threshold, and redistribute the funds when needed in an efficient and transparent way.

The minimum price should be set appropriately to reflect local market conditions. Price floors should ensure that they are enough to cover production costs for farmers. If these prices are set too low, they may not cover farmers' costs, and therefore will put coffee supply at risk as farmers are not able to invest in their farms and/or may exit the sector looking for more viable economic opportunities.²⁸ If prices are set too high, they can become unsustainable and require long-term subsidies.

Transparent price differentials for quality are necessary to ensure that smallholders are incentivized to apply good agricultural practices and produce quality coffee. If farmers are assured a minimum price, farmers may not have incentives to invest in producing good quality coffee. Therefore, farmers producing high-quality coffee and selling it at such to importers or roasters, should be able to receive a premium.

Efficient collection and disbursement tools. Having tools that reach all farmers – especially those in the last mile – can determine the mechanisms' scale and impact. For example, in Colombia there is the 'cedula cafetera' (coffee ID) that links coffee farmers to their bank accounts, allowing the government to track how much each farmer sold, so that the government can pay farmers back a differential in cases when the coffee subsidy is activated. For example, in April 2019, once C Contract prices reached \$94 per quintal, the government of Colombia offered to reimburse about \$3 per quintal to coffee farmers.

²⁸ They should however NOT cover production costs that are so high that producers would not be profitable in high price OR low price years, particularly if there are other more profitable alternatives. If there are, in fact, no alternative products that are economically viable, governments should assess the fundamentals such as basic infrastructure and enabling environment conditions (in other words, policies and the legal and regulatory framework) to determine why this is the case.

Box 5. Price stabilization case study: COCOBOD stabilization fund

HOW IT WORKS

The Ghana Cocoa Board (COCOBOD) uses a stabilization fund to regulate farmgate prices. COCOBOD guarantees farmers market access and a minimum price guarantee in order to reduce farmers' experienced volatility. COCOBOD also facilitates tax collection, which, in turn, it re-invests in the sector.

COCOBOD guarantees smallholder farmers a minimum price of approximately 70% of the FOB price of forward sales. The government's stabilization fund covers the differential when prices fall below a minimum price set. Prices are set based on export prices. Licensed Cocoa Buying Companies purchase cocoa from farmers at the set minimum price. The Cocoa Marketing Company (CMC), a monopolistic exporter (subsidiary of COCOBOD) forward sells or hedges approximately 70% of the expected annual harvest.

The price stabilization program is not without downsides. High transaction costs needed to maintain the system, lead to lower price realization for farmers at the farmgate than in liberalized markets. In addition, the use of a stabilization fund can create false price signals that can potentially lead farmers to produce more cocoa than what is demanded (which can cause a decline in global prices). In addition, neighboring Cote d'Ivoire, also a major cocoa producer, uses a different system to stabilize prices. When Ghana has a higher price, cocoa from Cote d'Ivoire is smuggled into the country; if the opposite is true, cocoa is smuggled out of the country.

KEY SUCCESS FACTORS

Strong government oversight of the sector and technical capacity is a key success factor. The government controls whom farmers sell their cocoa to and can enforce set prices, capture all sales through a monopolistic exporter, control levels of side-selling and smuggling, and negotiate good forward contracts. A strong government / sector association should be able to set up a stabilization fund and relatively easily replicate the mechanism. Technical capacity would be needed to successfully use financial hedging instruments for the the government to manage its own risk, or this would drain scarce government resources that could be used more effectively elsewhere.

Prices defined for the stabilization fund should be high enough to cover production cost and be viable in the international market. If prices are not high enough to cover production costs, farmers will not be incentivized to continue producing. However, if prices are too high compared to market prices, the government will have to subsidize the sector perpetually.

Ghana is a major cocoa producer globally, which allows CMC to leverage its market power to achieve a higher price, reducing the downside of risk exposure. Ghana produces approximately 30% of the world's cocoa. In addition, it has a particular flavour that is required in the majority of commercial chocolate recipes, which typically blend multiple varieties. This gives significant market power to CMC, which can therefore use to reduce its risk exposure

Mechanism 3.3: Supply stabilization

How it works

Managing the country's supply to influence local prices. Government or sector associations buy coffee, keep it in warehouses, and sell it when supply is low or prices are high to regulate the amount of supply in the market and induce changes in the price. This mechanism requires strong government intervention, strong financial capacity to cover costs of purchasing coffee and storing it, and warehouses with large capacity. This mechanism does not ensure a minimum price and does not address power dynamics or asymmetries of information along the value chain. Moreover, because coffee prices depend on international markets, as opposed to local market conditions, and because most coffee is traded as a commodity, this mechanism might not be effective unless major producer countries coordinate on such a strategy to influence global supply of coffee, making it a very impractical solution. This mechanism would also distort the coffee market.

Key success factors

Coordination between major producing countries to be able to influence the global supply of coffee. Given coffee prices are determined at the ICE at the global level, managing supply only at the local level may not be effective unless (1) it is in a large producer country (e.g., Brazil or Vietnam), or (2) there is some seasonality or volatility the country can take advantage of than if farmers sell alone. For this strategy to be an effective tool to influence prices, producing countries would then need to coordinate between them to affect global the supply of coffee.

The government or industry association must have the capacity to monitor and estimate the impact their sales will have on prices and production. This mechanism is easiest to employ in tight value chains where coffee is regularly delivered to a registered warehouse over which the government has oversight – this way side-selling can be controlled.

Stocking infrastructure is critical, as the government or sector association needs to store the coffee in warehouses for undefined periods of time.

CATEGORY 4: RELOCATE RISK ACROSS ACTORS

Mechanism 4.1: Over-the-counter contracts

How it works

Provides farmers with tailored contracts to protect them from price volatility. OTCCs are contracts agreed between two parties without the supervision of an exchange. The two parties agree beforehand on a specific quantity, quality, and price for the contract. For example, the farmer and the intermediate buyer (e.g., cooperative, intermediary, exporter) agree in advance on a price for a future sale, so that if the price falls, the farmer is guaranteed the agreed-upon price. In addition, the farmer can purchase an option from the intermediate buyer to protect himself from changes in market price after he or she has agreed a price. In this case, for example, the farmer and buyer agree on a price of \$94 per quintal for a future sale and the farmer buys an option to benefit from a potential price upswing for \$100 per quintal. Therefore, if prices fall below \$94 at the time of the harvest, the farmer receives \$94 because that was the agreed price with the buyer. If prices increase, farmer will be able to receive \$100 through the option. A

physical transaction normally takes place at the contract's maturity. This mechanism is most often led by cooperatives or exporters.

There are four different pricing models for OTCCs, each with trade-offs between stabilizing prices and reaping benefits from market upswings (Figure 8). **Market price + differential** OTCCs allow producers to fully benefit from market upswings but leave them fully exposed to market price volatility, and so are poorly suited to serving as a PRMM. **Fixed price** OTCCs fully protect producers from market price volatility, but farmers cannot benefit from upswings in the market (i.e., they have strong incentives to default on contracts when market price goes over set fixed price). **Market price + differential & minimum floor price** OTCCs, meanwhile, partially protect farmers from reductions in the market price while also permitting them to benefit from upswings in the market—. However, farmers are unlikely to find buyers willing to buy some or all of their harvest under this type of contract, because it forces buyers to take on all the risk of price volatility. Finally, with **market price + differential & minimum floor + maximum ceiling price** OTCCs, producers are partially protected from reductions in the market price but can only partially benefit from upswings in the market (i.e., if market price goes above set maximum price, producers have incentives to default on contracts). However, since this model also protects buyers from side selling, this model is most likely to create a long-term buyer-seller relationship, since it provides partial price volatility protection to both buyers and sellers.

Figure 8. Relative advantages and disadvantages of the four types of price fixing models for OTCCs from the perspective of producers only²⁹³⁰

Pricing type		Advantage for producers	Disadvantages for producers	Suitability as a PRMM
A	Market price + differential	Fully benefiting from market upswings	Fully exposed to volatility in the market price	Low
B	Fixed price	Fully protected from volatility in the market price	Cannot benefit from upswings in the market (i.e. producers have strong incentives to default on contracts when market price goes over set fixed price)	Medium
C	Market price + differential & minimum floor price	Are partially protected from reductions in the market price while also being able to benefit from upswings in the market		High
D	Market price + differential & minimum floor plus maximum ceiling price	Are partially protected from reductions in the market price and can also partially benefit from upswings in the market	Can only partially benefit from upswings in the market (i.e. if market price goes above set maximum price producers have incentives to default on contracts)	Medium

B, C and D are the preferred pricing models for OTCCs as PRMMs

The ability and willingness of intermediate buyers to offer producers these different OTCCs pricing models depends on six key factors outlined in Figure 9.

²⁹ Although the table lists pricing type C as having “High suitability” it can in fact be a difficult model to follow in practice. Producers are unlikely to find buyers willing to purchase some or all of their product (unless they are “social” buyers like NGOs which have limited funds to do so), because this model forces sellers to bear all of the burden of price volatility.

³⁰ Although model D is listed as having medium suitability as a PRMM, this model is most likely to create a long-term buyer-seller relationship, since it provides partial price volatility protection to both buyers and sellers.

Figure 9. Factors that determine the ability and willingness of market actors to participate in OTCCs³¹

		Ability	Willingness
Contract between intermediate and subsequent buyer			If the intermediate buyer has an B, C or D arrangement with the subsequent buyer , the intermediate buyer can guarantee the producer the same type of contract (once they subtract their margins/transactions costs) without needing to use financial derivatives
Access to financial derivatives			If the intermediate buyer has access to the financial derivatives market, they can use call-options to allow producers to reap the benefits of upswings in the market, even if the buyer has a B (fixed price) arrangement with the subsequent buyer. Similarly, access to put-options allows intermediate buyers to guarantee themselves and the producer a minimum price floor even if they have an A (market price) type arrangement with subsequent buyers
Cost of financial derivatives			The absolute value of the strike price of options, as well as changes in market prices, impact their prices . For instance, for put options, the lower the value the strike price, and the lower the difference between the market price and the strike price, the cheaper the option. Therefore, low strike prices in certain coffee markets (due to low production costs and therefore low minimum floor prices), or increases in market price, result in increased economic feasibility of using put options ¹
Coffee market type			Intermediate buyers operating in the differentiated coffee market (e.g. based on quality, origin etc.) have more incentives to offer these contracts as a means of locking in the supply of the specific coffee desired by the subsequent buyers
Level of competition			Strong competition among intermediate buyers or subsequent buyers results in more incentives for intermediate buyer to invest in their relationship with suppliers to lock in supplies
Type of intermediate buyers			Intermediate buyers with a mandate to operate in the interest of producers (e.g. cooperatives) are more likely to be willing to invest in offering producers these OTCCs than other private or profit-motivated actors (e.g. exporters or independent intermediaries)

The viability of different pricing options depends on several value chain characteristics. The quality of coffee, availability of finance, and type of intermediate buyer will all determine what pricing model will be most viable. Across pricing models, however, the current viability of OTCCs in the bulk market is lower than in the differentiated or specialty market because it would have relatively higher investment costs and lower intermediate buyer willingness to invest in the relationship with their suppliers (Figure 10).

³¹ Use of financial derivatives also requires technical capacity to use these instruments effectively. Call options also protect the intermediary buyer from producer side-selling in times of high prices, since it provides access to the coffee needed to fulfill its contracts at reasonably low prices.

Figure 10. Characteristics that enable or promote the viability of different pricing models³²

B. Fixed price	C. Market price + differential & minimum floor price	D. Market price + differential & minimum floor plus maximum ceiling price
<ul style="list-style-type: none"> • More viable in differentiated coffee market since (i) it requires buyer willingness to decouple pricing from the market price, and (ii) the fixed price must be higher than the market price for the risk of producer default to be minimized • Does not require access to finance by intermediate buyers since there is no need for them to use financial derivatives, unless the intermediate buyer has an A type arrangement with the subsequent buyer 	<ul style="list-style-type: none"> • Viable in both the bulk and differentiated coffee markets because it allows pricing to be largely determined by market prices • Access to finance by intermediate buyers is essential to fund use of financial derivatives which is usually required, unless the buyer has the same pricing type with the subsequent buyer. This is especially true for intermediate buyers in the bulk market who may face: <ul style="list-style-type: none"> ○ High put option costs if the market price decreases to a level below or close to the necessary strike price to guarantee the desired minimum price ○ High call option costs if the strike price is low or close to the going market price • Requires an intermediate buyer who is willing to only cover costs rather than make a profit out of mediating the transaction, for producers to optimally benefit from upswings in the market 	<ul style="list-style-type: none"> • More likely to attract private intermediate buyers than option C since they can also benefit from market upswings <ul style="list-style-type: none"> ○ This in turn is more likely to occur in bulk markets where there is (i) strong relationship between value chain actors or (ii) strong competition among buyers or in the differentiated coffee market

Key success factors

Intermediate buyers offering the OTCC need to be able to manage the price risk themselves, either through OTCCs with subsequent buyers (e.g., exporters, importers, roasters) or by investing in derivatives. OTCCs reallocate price risk from farmers to intermediate buyers. This means that intermediate buyers will only be willing to offer these types of contracts to farmers if they can manage the price risk themselves. This can be done through OTCCs with subsequent buyers

The cost of the OTCC needs to be viable and intermediate buyers need to have enough resources to cover this cost. Offering OTCCs may be costly because they require structuring a legal agreement with the producer, often purchasing coffee above market prices, and investing in price risk management. If this cost is too high and exceeds the gains from offering the OTCC (e.g., guaranteeing supply of good quality coffee), then intermediate buyers will have no incentive to invest in these. Even if the cost is viable, intermediate buyers will need to have enough capital, or access to financing, to cover these costs.

Intermediate buyers will likely need support in designing the instruments. Structuring OTCCs that are beneficial to both parties can be complicated and will require significant expertise in designing these types of contracts. Therefore, intermediate buyers may need support from organizations with experience doing this; these can be international trading companies (e.g., INTL

³² More importantly, Pricing Model D is more likely to attract private intermediate buyers because it allows them to be partially protected from producer side selling, when coffee prices are high.

FC Stone, see Box 6 **Error! Reference source not found.**), financial institutions (e.g., Oikocredit), or multilateral or social enterprises (e.g., IDB supported the Oikocredit program)).

Farmers must understand their financials, especially their costs and breakeven point.

When farmers understand their financials, they can better understand which specific OTCCs, and what prices, will make most sense to them. Farmers usually don't know their costs or breakeven price, so they are unwilling to predefine a price.

Farmers must understand and be willing to participate in OTCCs. OTCCs can be complicated to understand, which often means that farmers are reluctant to commit to this type of contracts. For example, ExpoCafe, a Colombian exporter has been offering OTCCs to farmers it buys from for the past 10 years. However, in 2018 only 10% of farmers were using these tools and, according to ExpoCafe, the main reason is lack of understanding of the mechanism. Increasing farmers' understanding of OTCCs, therefore, is crucial for the uptake and proper use of OTCCs. This can be done through trainings and constant support. Trainings can be used as well to collect farmers' feedback on OTCCs and tailor them to improve their use and buy-in. Finally, showcasing successful examples can also help to get more farmers to adopt this mechanism,

Finally, the country must have a stable legal framework to enforce contracts. Strong legal frameworks are required to ensure all parties adhere to contracts. Neutral third-party entities, such as NGOs, can also mediate alternative dispute resolution systems to promote

contract compliance. This helps reduce risk to all parties and makes the market more attractive

Box 6. OTCCs case study: De Los Andes OTCCs program in Colombia **HOW IT WORKS**

In Colombia, De Los Andes cooperative offers its members OTCCs to protect them against price volatility. De Los Andes offers two types of OTCCs to its members: futures and options. Farmers using futures can sell their coffee to De Los Andes whenever they consider market prices to be sufficiently high. The farmer and De Los Andes sign a contract agreeing on the price, quantity and quality of coffee to be delivered. At the time of the harvest, the farmer delivers the agreed upon amount of coffee and quality, at the agreed price. While this mechanism helps protect farmers against price drops, it does not enable them to benefit from price increases. Members of De Los Andes can also purchase an option or insurance from the cooperative to allow them to benefit from market upswings, if they use a future contract, or price drops if they are planning to sell their coffee at spot prices. For example, if the farmer sells his harvest using a future contract at a price of \$1.00 per pound, it can purchase an insurance for \$1.2, ensuring he will be able to benefit, at least in part, if prices increase. Farmers can also purchase an insurance to protect themselves against price drops. If, for example, current market prices are at \$1.00, the farmer can purchase an option for \$0.95 to ensure himself a minimum price at the time of the harvest.

In 2018, more than 50% of De Los Andes' members used OTCCs, which provided them with an average price 16% higher than market prices. In 2018, De Los Andes purchased 44 million kilograms of coffee, of which 24 kilograms were purchased using OTCCs. This resulted in an average farmgate price for De Los Andes farmers of COP 860,000 (\$278) per sack (125 kgs) of coffee in parchment, above the average market price in Colombia COP 740,000 (\$240).

KEY SUCCESS FACTORS

De Los Andes is a strong and well-managed cooperative. De Los Andes has a strong leadership team, with a business mindset and strong governance structure. This allows them to effectively structure OTCCs to their members, train them on how to use them, and to cover their own risk effectively. In addition, they are strongly committed to supporting farmers, and therefore are willing to pass through the benefits of price risk management and to offer other services like access to finance (which can be used to purchase options), training, and access to markets to their members.

De Los Andes has enough financial resources to invest in PRMMs and subsidize the cost for some of their members. De Los Andes uses derivatives to cover its own price risk, this is expensive and requires significant capital. In addition, for some of its farmer members, the cost of OTCCs is too high for them to purchase, and these are often the farmers who are most vulnerable to price risk; De Los Andes subsidizes the cost of OTCCs for some of these farmers using its own resources.

INTL FCStone trained De Los Andes staff members, of all levels, on OTCCs and derivatives, and supported the cooperative in the implementation of the program. INTL provided multiple training sessions to De Los Andes before they launched the OTCC program and provided one-on-one support when De Los Andes began to implement it.

Box 7. OTCCs: Costa Rican *coffee* value chain

HOW IT WORKS

The Costa Rican value chain transfers all price volatility from farmers to processors, by law. Farmers deliver their coffee in cherry to a processing mill. Upon delivery, the farmer receives a payment, known as an advancement and a receipt that details the amount of coffee they delivered and guarantees its traceability. The mill then processes the coffee to green coffee and exports it. After the mill has sold and exported the coffee, they report the sale to ICAFE, the government's coffee institute, who keeps track of all coffee sales from the country. Depending on the negotiated price, the sale can have two outcomes for farmers: (i) coffee is sold at a premium, and processing mills must pay back the extra gains to farmers. Gains corresponding to the farmer are estimated as the total sales income, minus milling expenses, minus coffee fund taxes and a 9% gross profit allowance to the miller. Whatever is left after this goes to the farmer; or (ii) the coffee is sold at a price inferior to the advancement made to the farmer by the miller. This loss must be absorbed by the miller and has no implications for the farmer on the advancement they received.

This mechanism is considered an OTCC, as farmers and millers create ad-hoc understanding or contract every year for negotiations. When the farmer delivers the coffee, the advancement is defined between both parts. And though future payments depending on how coffee is sold in international markets is defined by law, these conditions could be replicated through OTCCs.

KEY SUCCESS FACTORS

ICAFE, the government coffee institutions, has strong control and visibility of all coffee transactions in the country. All coffee negotiated in Costa Rica must be registered in ICAFE. This allows ICAFE to closely steward the sector, and ensure farmers are receiving the payments that correspond to their work.

Motivating high quality coffee production. This mechanism helps farmers focus on producing high quality coffee, as their potential upside is defined by how much premium their coffee can generate. The higher the quality, the higher price it will be sold at, and the higher payment farmers will receive. This helps Costa Rica maintain international recognition for producing one of the world's finest coffees. Moreover, this helps Costa Rican coffee avoid some of the volatility from NYCC commodity grade coffee.

Financial literacy and expertise using derivatives. Millers operating in Costa Rica require high financial literacy and use of options to hedge risk. Millers commonly buy derivatives after they have negotiated coffee sells, to fix their prices. As a result, Costa Rican millers have become quickly well versed on the use of options.

Mechanism 4.2: Derivatives

How it works

Derivatives allow buyers, including cooperatives, intermediaries, exporters, and importers, to implement hedging strategies to protect themselves from price volatility. As OTCCs, derivatives are a contract between two or more parties, and the price is determined by an underlying asset, in this case, coffee traded in the ICE. Derivatives, as opposed to OTCCs, are standardized – there are predefined volumes and prices at which these are traded – and are traded in an exchange. Derivatives include futures and options. A future contract is an agreement to buy or sell a particular commodity or asset at a predetermined price at a specified time in the future. An option offers the buyer the right, but not the obligation, to buy (call option) or sell (put option) the coffee in ICE at an agreed-upon price during a certain period of time or at a specific date. For example, a cooperative offers a minimum price guarantee of \$80 per quintal to farmers. Then, the cooperative runs the risk that by the time it sells the coffee, the market price has fallen below \$80 per quintal, and will therefore lose money on the trade. The cooperative can cover this risk by using a put option with a strike price³³ of \$90 per quintal; if market prices fall below \$90, the cooperative exercises the option to sell at \$90, covering the losses incurred from buying the coffee at a higher price than it was sold. Derivatives do not require a physical transaction. Derivatives are mostly used to hedge the risk buyers are exposed to between the time of buying and selling coffee; making them less suitable for farmers.

Key success factors

Deep understanding of derivatives is critical, as they can be difficult to comprehend and manage. Derivatives commonly require close monitoring to adjust risk exposure and guarantee risks are being covered. This can require a lot of training. Moreover, implementation and trial and error are key to familiarize buyers with them. This leads for derivatives to be improbable to be accessed by individual farmers. Buyers that access derivatives will probably require a dedicated team to constantly analyze their physical positions and hedge it with derivatives, suggesting that the team must manage a large quantity of coffee to be worth the effort.

Access to finance is key to trade derivatives, as they are expensive. Players that want to access derivatives must have access to an account to buy them, and access to capital to ensure they can buy and respond to derivative's needs (e.g., margin calls). Social enterprises and/or financial service providers can provide financing to access derivatives. Alternatively, derivatives can be accessed in tight value chains, where farmers/ farmer groups have a close relationship with exporters. For example, farmers or cooperatives can access derivatives through exporters' accounts and negotiate with them how and when they will cover the costs for accessing them.

³³ A strike price is the price at which a derivative contract can be bought or sold (exercised). For call options, the strike price is where the security can be bought by the option buyer up till the expiration date. For put options, the strike price is the price at which the security can be sold by the option buyer up till the expiration date.

Box 8. Derivatives case study: Sustainable Harvest Priced-to-be fixed contracts

HOW IT WORKS

In Latin America, Sustainable Harvest helps cooperatives hedge price risk by combining forward contracts and options. Participating coops use a “variable sale,” strategy which combines two elements: (i) a forward price-to-be-fixed (PTBF) contract (which allows buyers to agree on a price with the smallholder within a specified period) and (ii) a call option, which allows smallholders to benefit from subsequent price increases, and which coops can purchase at the time they fix the price of the PTBF contract. Sustainable Harvest provides coops with financing to access options, as well as training, information, and analysis on markets and derivatives.

Between 40-50% of all smallholders’ contracts, with a timespan longer than three months, are traded with this strategy. The call option acts as an insurance for cooperatives. Improved monitoring, trading, and risk management provides more and cheaper finance as lenders understand better how this system functions and the assurances it provides.

KEY SUCCESS FACTORS

Strong and well-managed cooperatives that have a deep understanding of farmers’ economics. Cooperatives participating in sustainable harvest are vetted to ensure they have farmers’ best interest as a priority. Cooperatives must also have strong relationships with their members. Sustainable Harvest must also confirm participating cooperatives have a minimum size of production that will make it feasible to buy options.

Longer-term training to strengthen financial literacy and discipline, The Sustainable Harvest program consists of ongoing trainings including on the functioning of markets, market analysis, the role of futures, using put and call options, and related subjects such as daily position analysis. To implement strategies, participants managed their positions through an account established by Sustainable Harvest and are charged a minimum fee.

Box 9. Derivatives case study: Oikocredit training program

HOW IT WORKS

In Honduras, OikoCredit provides training and financing to cooperatives to develop hedging strategies using derivatives. Launched in 2017, the program has supported 16 selected cooperatives from LATAM (Honduras, Guatemala, Costa Rica, Nicaragua, Colombia, and Peru) over a three-year period. Participating coops can offer over-the-counter PRMMs to associated farmers (e.g., future contracts, insurance). Cooperatives access futures markets and hedge the coffee of their affiliated farmers, while OikoCredit provides financing to cover costs related to price risk management.

In addition, Oikocredit provides training of farmers groups, from basic internal financial structure to accessing sophisticated PRMMs. Oikocredit's PRM program: (i) strengthens technical knowledge to understand cost structures and how price affects their business; (ii) supports organizational development, strengthening the capacity of coops to effectively implement PRMMs; and (iii) increases access to finance and more sophisticated PRMMs through its credit facility and loans specifically designed to finance derivatives accompanied by training on how to use these financing mechanisms. This training enables cooperatives to fully understand their market positions, understand the implications of taking a short or long position, which then enables them to effectively manage risk using derivatives.

KEY SUCCESS FACTORS

Tailored and continuous training to participating cooperatives. The training offered by Oikocredit was designed taking into account the specific needs and capabilities of the farmer groups. This allowed Oikocredit to meet farmer groups where they were in terms of understanding the basic concepts needed for managing risk and provided a training that was appropriate to their needs.

Long-term support helps improve sustainability and deep understanding of derivatives. OikoCredit has a multi-year approach, as opposed to traditional one-day trainings / workshops. Its methodology relies on well-prepared trainers that can tailor the message to their audience, rather than experts that have the tendency to focus on technicalities.

3.3. APPLICABILITY AND SUCCESS FACTORS OF PRMMS

The conditions of a value chain help determine the appropriateness and potential impact of each PRMM. We found that there are six value chain characteristics that are important to consider when defining whether a PRMM is appropriate or not, and how impactful it is likely to be. These are whether farmers:

1. Produce high-quality coffee
2. Have access to finance and resources (e.g., inputs, training)

3. Belong to a tight value chain (i.e., farmers consistently sell their coffee to same cooperative or intermediary across years)
4. Aggregated in a well-managed cooperative or farmer group
5. Belong to a value chain that is vertically integrated, and
6. Whether there is a lot of intervention from institutions in the sector, either government institutions or sector wide associations that have the capacity to influence policy and implement programs across the industry³⁴.

While some of these conditions can be key requirements or enablers for the successful implementation of a PRMM, they should not be taken as the only source of information when selecting one. Other factors, such as macroeconomic and political contexts, farmers' willingness and capacity to use PRMMs, and international market prices (i.e., if farm gate prices are low and have been for long periods of time, the potential impact of most PRMMs is significantly reduced) also need to be considered.

We assessed the key requirements and enablers for each PRMM to identify when they are relevant. Error! Reference source not found. shows which of the six value chain characteristics are required, and which are important enablers for the successful implementation of each PRMM. In summary:

- **Independent marketplaces (in other words, outside of exchanges) are most suitable for specialty coffee markets** because the buyers that participate in these markets do so because they are looking for coffee from a specific origin or with distinct characteristics, different from commodity coffee – which is more easily sourced through the traditional channels - and are therefore willing to pay prices above C Contract. This mechanism, therefore, is more likely to work for either small niches of specialty coffee across the world, or countries that have specialized in producing high-quality coffee, like Guatemala, for example.
- **Warehouse receipts work best in markets where farmers have access to resources** that enable them to process coffee, store it, and patiently wait to sell when market conditions change. In practice, this means that farmers can either process their coffee from cherries to parchment on their own, or have access to a processing center,

³⁴ The first five characteristics are all desirable characteristics for a value chain because they generally translate into better conditions for farmers. For example, farmers producing high-quality coffee are more likely to receive higher prices, or farmers who belong to well-managed cooperatives tend to receive services from these groups (e.g., inputs, training, finance) and often have higher bargaining power. The last characteristic, however, is more nuanced. There are cases in which strong intervention from institution in the sector is beneficial for farmers. For example, Fedecafe in Colombia has played an important role in building farmer resilience (e.g., through extension services, enabling access to dry mills), building the country's brand, and advocating for policies that support farmers. In other cases, high government intervention may not be necessarily positive for farmers. For example, in Ethiopia, the strong control the government holds over who can buy coffee from whom at each stage of the value chain has impacted to level of competition in the market and resulted in farmers receiving relatively low farmgate prices compared to export FOB prices. In any case, some of the PRMMs outlined require the existence of a strong institution that can dictate policy and/or implement industry-wide policies.

have access to a warehouse to store the coffee securely, and access to finance to cover their expenses while they sell their coffee. Most farmers access these services through intermediaries or cooperatives, and therefore, tight value chains, where farmers have strong relationships with intermediaries, and well-managed cooperatives, are important enablers for this PRMM.

- **Pooling the risk of producers could in theory work if prices of the various types of coffee are not covariant³⁵ and taking advantage of economies of scale only works if there are strong and well-managed farmer groups** that can effectively pool demand for coffee and spread risk across farmers. This mechanism depends on a group effectively aggregating supply of coffee with different qualities and risk profiles, selling the coffee at different prices according to quality, and offering a more stable price to all members of the group. For this mechanism to work well, at least a share of the coffee aggregated should be high-quality or certified. Access to finance for farmers and training to secure the supply high-quality coffee is an important enabler.
- **Price and supply stabilization work best in markets where there is high intervention from institutions in the sector.** Because these two mechanisms focus on intervening in the market broadly (e.g., setting price floors, developing a stabilization fund, or managing the country's coffee supply), they require the existence of an institution that is capable of setting and implementing policy, managing a large amount of resources, and with a strong understanding of market dynamics.
- **OTCCs are best suited for markets with tight value chains or well-managed cooperatives** where farmers and intermediate buyers (either intermediaries or cooperatives) have strong relationships and trust each other. Because OTCCs are agreements between two parties, without a clearing corporation (like in the case of derivatives), each party bears the risk if the other party defaults. This means that trust between the two parties is essential for the mechanism to work, especially when multi-year OTCCs are signed. (However, as discussed above, with sufficient technical capacity and finance, financial hedging instruments such as put and call options can be used to mitigate the risk of default. In addition, OTCCs may be costly and difficult to structure, and therefore, access to finance and knowledge and training, for both farmers and intermediate buyers, is an important requirement. The existence of a strong legal framework, or a third-party dispute resolution mechanism, is also an important enabler to encourage the different parties to sign OTCCs.
- **Derivatives work best in markets where there are well-managed cooperatives** if the benefits are to trickle down to SHFs. Derivatives are widely used by coffee exporters across the world; however, these rarely reach farmers because most exporters don't have strong relationships with farmers and no real incentives to pass through some of the benefits of this PRMM. Benefits of the use of derivatives are only likely to trickle to farmers if a cooperative manages its risk with derivatives and transfers some of the benefits to farmers through OTCCs. Trading derivatives is expensive and technically complicated, therefore, access to finance and technical support for cooperatives is an important requirement as well. In some cases, cooperatives manage their risk using derivatives through exporters' trading accounts at a fee; this will be more likely to happen in tight value chains where cooperatives and exporters have built strong relations.

³⁵ This assessment did not explore whether or not producer groups selling multiple types of coffee actually sold coffee with covariant prices or not, so it's unclear whether the case study uncovered actually represents successful risk pooling or just increasing profitability by taking advantage of economies of scale.

The potential impact of each PRMM depends on how many farmers it can reach and how well it can cover price risk (Error! Reference source not found.). Independent marketplaces and derivatives, for example, are only suitable for a specific set of actors or are difficult to implement, and therefore, have limited potential to reach smallholder farmers broadly. Warehouses will have limited impact if prices fall for a prolonged period of time, because eventually farmers will have to sell their coffee without effectively having managed risk. Risk pool of producers and OTCCs have the potential to have a deep impact because, if implemented properly, these mechanisms can effectively cover risk for SHFs. However, while there are successful examples of these models being implemented, they require farmers to belong to well-managed cooperatives and/or belong to tight value chains with intermediaries willing to provide OTCCs, which is not very common in some coffee producing countries. This limits the potential breadth of these PRMMs. Finally, price and supply stabilization both have the potential to impact a large number of farmers, including those that do not belong to cooperatives. However, these mechanisms require a strong sector-wide organization implementing them in a transparent and efficient way, which may limit how effectively they cover risk. In addition, they can distort markets, drain scarce government resources that could be used elsewhere more effectively, and turn into a perpetual subsidy.

3.4. REMAINING AREAS FOR RESEARCH AND NEXT STEPS

The considerations outlined in the previous section provide a high-level overview of what PRMMs may be relevant under different conditions, however, to determine specific interventions in a country further research would be required.

Key areas that should be explored further include:

Mapping of potential PRMMs to coffee and cocoa producing countries. Further research should focus on developing country archetypes based on the six characteristics of the value chain identified above as important to select appropriate PRMMs. For example, one archetype of countries could be those that produce high-quality specialty coffee, but where farmers have difficulties accessing premium markets (e.g., Guatemala). Another archetype could be countries with tight value chains and strong relationships between different players, where farmers have access to resources through actors in the value chains (e.g., Colombia). The most relevant and viable PRMMs could then be mapped to the different archetypes, based on the main challenges' farmers face in each type of country and the key enablers that are available. For example, for countries producing high-quality specialty coffee, where farmers have difficulty accessing premium markets, an independent marketplace could be suitable³⁶. In the second example archetype, OTCCs will likely be easier to implement due to the existence of tight value chains and strong relationships between players in the value chain. The PRMMs could then be prioritized based on

³⁶ However, it is important to reiterate here that only about one-third of certified coffee is able to be sold at a premium, demonstrating that “premiumization” as a strategy is often unsuccessful.

the mechanisms' potential to reach a large number of farmers and to mitigate price risk upon consideration of some of the caveats noted in previous sections. In addition, it could be worth identifying what may be interesting ideas to test and innovate and, under what context it is best to do so.

Mapping of key actors in the selected countries or archetypes to identify potential implementation partners. Most of the PRMMs are targeted to a specific type of farmer and require multiple partners for the successful implementation, including, for example, organizations that provide training, financing, and those that lead the PRMM. Therefore, once the value chain archetypes have been developed and mapped to potential PRMMs, it will be important to identify who are the key actors in each value chain. Key questions include:

- What type of farmers will be the main beneficiaries? For example, what share of farmers belong to cooperatives or tight value chains? Do farmers have access to financing?
- Who will be leading the PRMM? Do the potential leads have enough financial resources and technical capacity? Will they require financing and/or training?
- Are there organizations in the country that can provide support services (e.g., financial institutions, NGOs or government agencies providing technical assistance)?

Mapping the actors in the value chain will help identify potential partners for the intervention. Due diligence should be conducted for all potential partners to ensure that they are a good fit for the program, have a strong track record working on similar programs or issues, and that they are motivated to participate.

Detailing the design of the selected PRMMs. Once a set of priority PRMMs has been identified, it will be important to define in more detail the design of the PRMM. This includes defining who will be the main beneficiaries and how will they be reached and targeted; what is the cost of the intervention, who finances it and how; and how is the mechanism structured, including defining what will be the pricing model, what are the key incentives for different actors involved, and what is the role of different partners, among others. These questions need to be answered considering each country's specific conditions, given that the design of the PRMM may vary depending on the archetype and country context. For example, for a price stabilization fund, it will be important to define, based on the specific market conditions, what is the structure of the fund, including how it is financed, how to define the minimum price threshold (e.g., price should be sufficient to cover local costs of production for a farmer that is at least profitable when international coffee prices are high or somewhat high, but only struggles when prices are unusually low), who manages the fund (e.g., is there a government agency that is well-positioned to manage the fund? Or a coffee association?), how is the fund invested (are financial hedging instruments able to be used successfully to manage price risk, so that the fund doesn't become an ongoing subsidy, stretching government resources thin regardless of whether prices are high or low, among others. In the case of OTCCs, for example, it would be important to define what sort of contracts could be designed in a way that is beneficial to buyers as well as sellers (e.g., futures, forwards, options, minimum price guarantee), how does the intermediate buyer cover its risk (e.g., derivatives, OTCCs with subsequent buyer), how are the contracts financed, and can contracts be structured in a way that incentivizes both buyer and seller commitment to the agreement (such as strengthening cooperatives, or developing alternative dispute resolution systems).

Planning for implementation. Finally, once a country or group of countries has been selected, the PRMM designed, and the partners identified, the lead organization should develop an implementation plan. This includes detailing what the timeline for the program will be, what resources are needed, and what will be the key roles and responsibilities of the different partners. In addition, the implementation plan can include the trainings that will be required for all parties involved before the implementation of the program, and if applicable, any pre-PRM enablers that need to be in place (e.g., access to finance for warehouse receipts, access to internet in the case of digital marketplaces, or training cooperatives to better understand price risk, design contracts with their producers and buyers keeping price risk management concepts in mind, and improve outreach so that farmers better understand the benefits a cooperative is providing). The implementation plan could also include a monitoring, evaluation and learning (MEL) plan to ensure that the partners involved are learning in the progress and adjusting at needed.

4. COFFEE VALUE CHAINS IN GUATEMALA AND HONDURAS

4.1. GUATEMALA

4.1.1. OVERVIEW

Coffee is vital for the Guatemalan economy; the livelihood of more than 500,000 Guatemalans depends on coffee and the sector contributes 6% to agricultural GDP. Coffee in Guatemala is produced by 120,000 SHFs who produce about half of the country's coffee and a few large farmers. The sector is the second largest employer in rural areas in Guatemala. Coffee represents one of the major sources of foreign exchange, accounting for 13% of Guatemala's exports and 61% of its agricultural exports.

The high quality of Guatemalan coffee allows farmers to realize a price above the C Contract price. ANACAFE, the National Coffee Association has successfully branded Guatemalan coffee as specialty coffee, promoting eight differentiated brands from different regions of the country. As a result, Guatemalan coffee is sold in international markets with an average premium of \$40 per quintal above the C Contract price. Moreover, the high quality of coffee and the importance of traceability, at least to the region of origin, has allowed farmers to receive a large share of the export price, at about 89% on average. However, not all farmers receive the quality premium, either because they sell to intermediaries in cherry who do not differentiate for quality and sell all coffee as bulk, or because farmers or the cooperatives they sell have limited access to premium markets.

However, the sector is threatened by low productivity and low international prices. The average yield of a Guatemalan coffee farmer is 19 quintals per hectare, below that of Honduras (21 quintals per hectare), Colombia (23 quintals per hectare), or Brazil (33 quintals per hectare). This is due to a sector characterized by little use of technology for planting, harvesting, and processing, old trees, and limited or incorrect use of fertilizers. The low productivity result in high production costs, at about \$200 per quintal (compared to \$90-110 per quintal in Honduras). The

high production costs mean that farmers operate at low margins or losses, increasing their vulnerability to low prices or price fluctuations.

Price volatility has led to a negative cycle in the Guatemalan coffee sector, where unpredictable and falling prices lead to underinvestment, which leads to falling production and quality, further reducing prices to farmers. The low prices (sometimes below production costs) and uncertainty about future trends, translate to less investible capital or incentives to invest for farmers, hampering the production volume and quality for the following season. During periods of sustained low prices that are below production costs, farmers in Guatemala reduce the use of fertilizers to reduce costs, which reduces their productivity, suggesting a lack of access to finance is a serious constraint. This further reduces farmers' incomes by decreasing the amount of coffee produced and the quality. Falling revenues for coffee farmers have also weakened the sector associations and cooperatives who depend on contributions from the sector, hampering their ability to support SHFs. For example, ANACAFE's and Fedecocagua's budgets depend on contributions for coffee exported and membership fees, respectively. With falling production volumes and prices, their overall budget decreases, limiting their capacity to implement price risk management mechanisms or provide additional support to SHFs.

4.1.2. VALUE CHAIN STRUCTURE AND PRICES

Ninety-seven percent of producers are smallholder farmers, most of who sell coffee through a highly fragmented value chain. Guatemalan smallholder farmers commercialize coffee through two main channels. Smallholder farmers are either unaggregated (70 – 80%) or aggregated members of a cooperative (20 – 30%). Unaggregated farmers typically sell their coffee in cherry to intermediaries through one-off transactions the day of harvest, due to the cherry's high perishability. Aggregated farmers often have more capacity to process and sell their coffee either as wet or dry parchment to the co-op. Aggregated farmers agree beforehand with the co-op the amount and quality of coffee to be sold and face penalties if they fail to fulfill their agreement.

Intermediaries are powerful actors in the Guatemalan coffee sector; they trade most of the coffee in the country and given the limited competition between them they have significant price -setting power at the farmgate level. About 70-80% of Guatemalan coffee passes through intermediaries, as the majority of SHFs sell to intermediaries and some co-ops sell part of their production to them. Intermediaries lock farmers in by providing much needed pre-harvest financing at high interest rates (18-21% per year compared to 11.7% offered by Banrural, and 8% offered to large farmers) with the requirement that farmers sell their coffee to them at a discount. Intermediaries agree on farmgate prices to farmers. Some intermediaries define prices by doing a one-on-one conversion from U.S. dollars to quetzals (e.g., if the C Contract price is \$100 per quintal, intermediaries pay 100 quetzals per quintal of coffee cherries). Given this exchange rate, farmers selling to intermediaries receive between 65% and 72% of the export price, mainly because this is sold as commodity coffee and does not receive a premium for quality.³⁷ Intermediaries have little incentives to separate coffee by quality because most exporters focus on the commodity level of the coffee market and pay upon delivery with few quality

³⁷ Based on international coffee prices of roughly \$96 per quintal on the NYSE in March 2019, unaggregated smallholders receive somewhere between \$65 and \$72 per quintal.

standards; separating the coffee would increase costs and time of processing. Therefore, intermediaries mix all coffee they buy and process it together into parchment. This limits the traceability of coffee to the region of origin and results in the coffee being sold to exporters at bulk commodity prices.

Cooperatives account for a much smaller share of the market (20-30%) because Guatemalan SHFs have little trust in these farmer groups. SHFs have little trust in cooperatives because they perceive them as corrupt and offering few benefits over intermediaries. Farmers and other sector actors interviewed mentioned that there is little transparency on how wealth is distributed between co-op members and that membership rarely results in tangible benefits. For example, farmers mentioned that co-ops generally offer the same prices as intermediaries, have less capacity to provide financing, and do not offer pick up services (which intermediaries do). In addition, many farmers feel that the membership fees are high and member meetings are not a good use of their time. . A focus on increasing cooperative member equity – increasing the amount of cooperative ownership that individual producers have – could help overcome the concern about wealth distribution. In addition, increasing cooperatives' technical capacity to provide services valued by producers could help members to see more tangible benefits.

Nonetheless, there are examples of well-functioning cooperatives which offer higher prices to their members and additional support services, as well as access to specialty markets. Most cooperatives define prices based on the price set by exporters (based on the C Contract spot price) and/or buyers, discounting their margins and processing costs. Aggregated farmers who belong to groups receive approximately 95% of the export price on average.³⁸ These well-functioning co-ops provide financing to their members, technical assistance, and access to inputs. Most co-ops deliver the product to second-tier co-ops, which either process and export the coffee or aggregate and sell the coffee to exporters. Coffee traceability is high, allowing the cooperatives to receive premiums from coffee sold with certificates (e.g., Fair Trade, UTZ) or high-quality, which are usually transferred to smallholder farmers. In most cases, exporters negotiate with buyers. In instances when co-ops negotiate directly with buyers, the former pay exporters a fixed fee for services (e.g., processing to green beans, exporting). Directly negotiating with buyers allows cooperatives to sell their coffee in specialty markets at higher prices, however, this requires significant investments in marketing and attending international fairs, and often first- and second-tier cooperatives struggle to sell all their high-quality coffee as such.

Most Guatemalan coffee is exported and there are multiple exporters in the country. Eighty-five percent of the exports are made by ADEC members, an association of exporters. Most exporters purchase coffee from intermediaries in one-off transactions and there are few instances of long-term contracts between exporters and intermediaries.

4.1.3. PRICE RISK MANAGEMENT

While price risk management strategies are being used in Guatemala today, they reach only large farmers or farmers that are organized into cooperatives. SHFs on

³⁸ Based on international coffee prices on the NYSE in March 2019, members of non-exporting co-ops receive roughly \$91 per quintal.

their own have little capacity to manage price risk because they operate at low or negative margins and have little access to finance, which limits their capacity to smooth their incomes in times of low prices. Most co-ops either aggregate resources across producers or depend on certificates, which provides producers a higher price over time, which helps to mitigate the impact of international price volatility on their livelihoods. For example, ACODIHUE aggregates different qualities and types of coffee from members (e.g., micro-lots, women-produced) and pays back a fixed, above-market price to producers for the season up front and a quality premium if coffee is sold as specialty or certified at a higher price. Other co-ops support producers to get certificates, which allow them to sell coffee at a higher price and ensure that farmers get a higher percentage of the sale price, which, while this does not change the volatility of the price received, can decrease the negative effects of price drops by increasing the farmers' margins. In the case of Fairtrade coffee, a minimum price of \$140 per quintal is guaranteed, protecting farmers from price volatility. However, not all Fairtrade coffee is effectively sold as such because farmer groups have difficulty connecting directly with buyers willing to pay Fairtrade price, so often end up selling at least part of their production at local market prices, therefore, farmers are not always ensured this minimum price.

More sophisticated co-ops structure long-term relationships with buyers in such a way that allows them to offer over-the-counter contracts to farmers and protect them from price volatility. These co-ops negotiate fixed prices with buyers and then provide fixed-price contracts to farmers. For example, Nespresso negotiates fixed-price contracts with co-ops in its supply chain to ensure that it procures its high-quality coffee from co-ops in Huehuetenango. The co-ops then offer a fixed price to their farmers. Other farmers that are organized into co-ops have access to price floors and ceilings through agreements with buyers. For example, first-tier exporting cooperative Nueva Esperanza del Bosque in Santa Rosa has been selling directly to a buyer since 2004. The buyer and Nueva Esperanza agree on a minimum and maximum price for four years, which Nueva Esperanza passes through to farmers (discounting their costs of processing and margins).

Smallholders not aggregated in co-ops have very few options to manage price risk. In Guatemala, their lack of access to finance and processing capacity leaves them entirely dependent on intermediaries. These intermediaries do not currently provide any PRMMs. For their part, commercial banks are reluctant to lend to smallholders due to lack of credit history and collateral. ANACAFE (National Association of Coffee) does not offer protection against price volatility and does not have access to market-based strategies (e.g., derivatives).

Other actors in the value chain use PRMMs but do not provide coverage to SHFs. Some cooperatives use back-to-back sales, meaning they hold coffee for as short a time as possible, commonly buying it after they have sold it, and thereby exposing themselves to little risk. FEDECOCAGUA uses this strategy by first negotiating with buyers and then procuring the negotiated coffee from its broad portfolio of member cooperatives. Most exporters in the country invest in derivatives to hedge their risk but do not offer any coverage to co-ops or farmers.

4.2. HONDURAS

4.2.1. OVERVIEW

Coffee is a major part of the Honduran economy, employing roughly 1 million people directly and indirectly and contributing 4% to GDP. The sector is composed of 100,000 SHFs who produce 64% of the country's coffee. In 2017, Honduras produced 7.3 million bags of coffee, making it the world's fifth largest producer. Production increased at a 6.4% compound annual growth rate (CAGR) between 1997-2017.

Most Honduran production is high-quality arabica, but the majority is sold at low bulk commodity prices. Honduras produces 100% arabica and 33% of its production is considered to be high quality, while the rest is commodity level. However, only 20% of coffee is sold with a quality premium. This is due partly to the limited brand recognition Honduran coffee has and the little traceability in the value chain. Most farmers sell their coffee through intermediaries who mix coffee from different producers, process it together and have little traceability. Intermediaries sell large volumes of coffee to exporters who are seeking to buy commodity coffee. .

Overall, Honduran coffee producers are threatened by low prices, increased costs to prevent rust, and lack of access to credit to invest in preventive measures. At current prices, smallholder farmers are selling at a loss—and many are already in debt from loans taken out for planting, renovation, and maintenance in previous harvests.

4.2.2. VALUE CHAIN STRUCTURE AND PRICES

Smallholder farmers make up 95% of producers; most of which commercialize their coffee through, and heavily depend on intermediaries. A large majority (85%) of smallholder farmers are unaggregated, depend on intermediaries, and have very little bargaining power. The remaining smallholders belong to producer groups and benefit from better prices and direct support.

Unaggregated smallholders typically sell coffee in cherry form on the day of harvest because they lack the processing capacity to wet- and dry mill their coffee. They are often forced to sell to intermediaries that lend money for the harvest (at extremely high interest rates of around 60% per year), and accumulate debts over multiple years, locking them into an arrangement that pays them around 52% of the export price.³⁹

Intermediaries then process the coffee into parchment and sell conventional coffee at the price imposed by exporters. Bean traceability is limited through this channel, as coffees from different farms and qualities are mixed together. Exporters buy large volumes from intermediaries in one-off transactions (intermediaries are the only players that can supply the large volumes required). Exporters process coffee into green beans and sell it as commodity at international market prices.

In contrast, smallholders **aggregated in producer groups** sell their coffee in cherry or wet parchment to the group, receiving around 68%⁴⁰ of export price. The amount of the coffee delivered is not predefined, but quality standards are rigorously applied. Farmers that belong to

³⁹ Based on international coffee prices on the NYSE in March 2019, members of non-exporting co-ops receive roughly \$50 per quintal.

⁴⁰ Based on international coffee prices on the NYSE in March 2019, members of non-exporting co-ops receive roughly \$65 per quintal.

producer groups still have a need for liquidity, but they have access to loans through the group. Producers commonly benefit from premiums for certificates of quality, paid only after the buyer has purchased the coffee.

The producer groups process coffee into dry parchment, assess the quality, and deliver to exporters or to importers/buyers with whom they have direct relationships. Coffee traceability is high, and farmers that supply coffee with certificates (e.g., UTZ, Fair Trade) receive a premium after the harvest. In Honduras, about 25% of the coffee exported is sold under a certificate. However, despite their direct relationships with buyers, some groups have found it difficult to access specialty coffee markets and to sell all of their high-quality production at a premium.

Export costs are high, and it is difficult for a group to set up an export facility, so groups that sell directly to importers/ buyers rely on exporters for logistical services. In some cases, exporters offer access to financial derivatives at a fee. Overall, the average costs of getting coffee from cherry to export are high—\$20 per quintal,⁴¹ as compared with \$4/quintal in Brazil and generally higher than other countries in the region. Producers also pay \$13 per quintal to the Instituto Hondureño del Café (IHCAFE) when coffee is exported.

Most farmers and co-ops perceive little support from IHCAFE, the National Coffee Association. IHCAFE is financed with contributions of \$4 per quintal of coffee exported and the money is intended to be invested back into the sector in R&D, extension services, and infrastructure (e.g., improving roads in coffee growing regions). However, with few extension workers (for example in Copan there is one extension worker for 3,000 farmers), most SHFs receive little direct support from IHCAFE. Infrastructure in coffee growing regions has not been updated in years and many private companies have made investments directly to improve the state of local roads. In the past, IHCAFE developed an escrow account to provide financing for farmers who needed to renovate their farms after the rust epidemic; farmers pay those loans back through automatic deductions of \$9 per quintal exported. In theory, all farmers who have already paid back their loans receive their \$9 per quintal back after coffee has been exported. However, in practice, farmers who sell coffee to informal intermediaries rarely receive their money back. In addition, those who receive their money back, do so about 7-10 months after they've sold their coffee, and there is no information or accountability about what IHCAFE does with the money while it is retained or how the interest rate gains made during that period of time is invested back into the sector. As a result, these price retention and redistribution mechanisms – including both the \$4 per quintal to finance IHCAFE and the \$9 for the escrow account - are perceived to lack transparency and efficiency.

4.2.3. PRICE RISK MANAGEMENT

While some actors in the value chain use PRMMs, most Honduran farmers do not have access to these. Unaggregated smallholders entirely depend on intermediaries that do not offer these kinds of support. Commercial banks are reluctant to lend to smallholder farmers due

⁴¹ This cost includes costs for processing, and transportation.

to lack of credit history and collateral, and there is no public or IHCAFE led program to protect farmers from price volatility.

There have been efforts in the country to strengthen producer groups and through these, provide a range of services to farmers. An example of this is the TechnoServe (TNS) MAS (Mejoramiento Agrícola Sostenible) program, which seeks to improve the livelihoods of coffee and bean farmers in Honduras. TNS provides support to farmers to improve their agricultural practices and the quality of their coffee and to create farmer groups. Once farmer groups are created, TNS provides training on how to effectively manage the co-op, how to access finance and how to provide financing to farmers. In addition, TNS connects the farmers and newly created farmer groups with exporters and helps them establish long-term contracts. For example, an exporter agrees to purchase a specified amount and quality of coffee, at a price to be determined at the time of harvest. Exporters, who want to secure their coffee supply and ensure a standard of quality, invest in the farmers by facilitating access to finance, either by providing financing directly to farmers or co-investing with a financial institution in a fund to support farmers. TNS facilitates this connection by serving as convener between the different parties and providing training as needed to farmers and farmer groups. This program has successfully helped farmers access financing (25,900 producers have been able to access \$15.5 million in credit) and increase yields (productivity increased on average 54%). However, exporters are required by law to purchase coffee only from legally established co-ops or intermediaries, otherwise they need to purchase coffee directly from farmers. But, establishing legal co-ops in Honduras is difficult and burdensome, creating some challenges to the program. Some exporters say that because many of the groups created are not yet legally constituted, exporters have to purchase the coffee individually from each farmer (instead of billing to one legal entity), which increases costs for exporters and creates a burdensome buying process.

Cooperatives and farmer groups, meanwhile, offer their members access to a range of PRMMS and services which increase overall profitability, thus mitigating the potential impact of price volatility. Producer groups like Cafico and COMSA provide technical assistance and financing to their members. COMSA also increases market transparency by sharing daily prices on WhatsApp, while the online platform Algrano.com connects producers and buyers directly enabling to negotiate prices. Banks are generally unwilling to loan to individual farmers, but often provide financing for fixed assets to groups based on the value of long-term contracts.

Sophisticated producer groups are more able to implement sophisticated PRMMS and pass through the benefits to farmers. These mechanisms include aggregating farmers and purchasing different qualities of coffee to ensure a minimum, and more stable and predictable price to their members. Some of these groups also employ OTCCs with farmers and use derivatives to hedge their price risk. There are for example, a few Honduran co-ops that participate in Sustainable Harvest's priced-to-be-fixed program. Exporters hedge their price risk using derivatives, but rarely transfer benefits directly to producers and are generally reluctant to stipulate long-term contracts with producers due to risk of default.

5. POTENTIAL PRMMS FOR SCALING IN GUATEMALA AND HONDURAS

This section outlines promising interventions for Guatemala and Honduras considering the market conditions described in Section 4. Farmers in these countries face many challenges and while there is no one silver bullet to address all of these, we have identified four potential interventions that can increase the use and impact of PRMMs. Considering that these two countries share many characteristics and key challenges, we are presenting solutions that apply to both; where relevant, we call out specific nuances that would influence the design of such a mechanism in these countries.

5.1. DIGITAL MARKETPLACES

In countries where farmers produce high quality coffee, but are unable to sell it as such, like in Guatemala and Honduras, digital marketplaces can reduce farmers' price volatility and increase the price they receive. Partial or full protection from price volatility can be achieved if producers are able to sign contracts well in advance of the harvest which include some increased level of certainty around prices they will receive. Farmers with access to the internet, access to coffee processing (i.e., access to means of processing coffee into green)⁴², and capable of producing high-quality coffee stand to benefit greatly from digital marketplaces. *Algrano* is one such example—an online platform where producers and cooperatives can connect directly with roasters; some producers in Guatemala and Honduras (e.g., COMSA) are already using it (see case study in).

Spotlight: avoiding side-selling

Frequently, farmers' urgent need for liquidity drives them to sell their coffee to stakeholders that can pay immediately, even if it means breaking an agreement. One potential solution to this challenge is for financial service providers to offer financing or credit to farmers contingent on them selling their coffee through the platform. The platform could also pay farmers an advance

Currently, producers in Honduras and Guatemala face limited access to premium coffee markets and often when coffee is sold at a quality premium, only a small share reaches smallholder farmers. Producers in Honduras and Guatemala often struggle to sell their high-quality coffee in markets willing to pay more stable and higher prices. For example, the producer group ACODIHUE in Guatemala, sells approximately 20% of its high-quality coffee in

⁴² Most farmers have access at least to a local mill that can wet and dry mill their coffee. If not, the digital marketplace could also help set up processing stations for farmers or connect them to existing stations.

the premium market and the rest as commodity—at lower and less stable prices because they are not able to find sufficient buyers for the premium coffee.

Digital marketplaces are particularly suitable for Guatemala, where the large amount of high-quality coffee produced means that it would be feasible to achieve the necessary scale for the market to be successful. For producers and buyers to be willing to participate in a separate marketplace, there need to be enough players participating in the market to create liquidity and competition. Guatemala produces approximately 400 thousand pounds per year of high-quality coffee, this means that about 10% of the country’s production would be required to make a digital marketplace attractive for multiple parties and, therefore, viable.

While Honduras has a smaller volume of specialty coffee and less recognition in international markets, there is value in scaling already existing models such as Algrano. Farmer groups in Honduras have started to innovate with processing techniques and producing high-quality natural and semi-washed coffees that are appealing in specialty market niches. Scaling digital marketplaces would allow Honduran farmers to increase the amount of coffee sold at premium prices.

Considering the conditions in Honduras and Guatemala, however, some of the key requirements for digital marketplaces may make it difficult for SHFs to participate. For example, because most farmers in Honduras and Guatemala are smallholders, lots offered by farmers may be too small, making them unattractive and costly to negotiate or transport. Algrano is able to circumvent this by aggregating lots from different farmers, but also by aggregating purchases from different buyers and shipping them together. Additionally, because most farmers will likely require financing to participate, when smallholders post lots that do not sell, they (or the platform if it is financing operations) are exposed to losses or liquidity crunches. For models in which farmers bid to fill a request, where it is important to have a strong internet connection that allows farmers to participate in real time, poor internet connection (which is common in rural areas in Guatemala and Honduras) may reduce farmers’ competitiveness. Finally, smallholder farmers’ limited knowledge of pricing, and their own cost structures, exposes them to risks such as setting a minimum price too low or high.

Potential partners and roles

- **Donors and multilateral organizations:** Donors can play a key role by training producers, strengthening existing platforms, and convening other players to provide support. For example, donors or multilateral organizations can help ensure that key requirements for digital marketplaces are met, including capacity to process coffee into parchment, access to internet and digital literacy, and access to financial services. NGOs, cooperatives, or other supply chain actors can train farmers on processing, digital literacy, and marketing their coffee. Multilateral organizations or financial development institutions (DFIs) can provide capital to existing programs such as Algrano to improve and strengthen their platforms.
- **National coffee associations:** In the particular cases of Guatemala and Honduras, key partners for this intervention include ANACAFE and IHCAFE, which can (i) sponsor or expand existing national / regional competitions, (ii) promote the use of online platforms as part of the national marketing strategy, and (iii) provide knowledge of where high-

quality coffee is produced to direct focus efforts and existing platforms (e.g., Algrano) that can be improved and scaled.

- **Existing platforms** (e.g., Algrano): Existing platforms that are being used locally can be leveraged to scale nation-wide
- **Exporters with processing capacity** (e.g., Dinamica, Green Planet): Can provide logistic services, processing ability (i.e., from parchment to green), and expertise of working with international buyers
- **Financial service providers**: Local banks (e.g., Banrural in Guatemala or Banco de Occidente in Honduras) and international institutions (e.g., Oikocredit, Root Capital) can support farmer groups in opening bank accounts and provide accessible credit
- Local education institutions/ training providers (e.g., Technoserve): can provide training and support to farmers on required skills to use the platform, practices for them to assess the quality of their coffee (e.g., coffee sommelier courses) and effectively carry-out negotiations through it

Remaining questions and next steps

Additional research and analysis would be required to define whether to implement this strategy and how the program would look like. Key questions include:

- **How would the digital marketplace be structured?** Additional analysis would be required to design how the platform works. Important components of the structure include i) how prices are going to be set, if for example, using traditional auctions or reverse auctions, or multiple pricing methods, ii) how do payments work in terms of when and how are payments made to farmers iii) who participates, for example, can any producers or buyers freely join the platform, or is there a vetting system beforehand to ensure good quality coffee is traded and that participants have the resources and capacity to fulfill their compromises; and iv) will other services be provided through the platform, like financing or market information
- **Who are the right partners?** We have outlined potential partners above, but additional analysis would be required to determine whether these are the right partners and if other types of partners will be required (e.g., financial service providers, digital payment solutions)
- **What is required for implementation?** Will an existing platform be scaled or a new one developed? If an existing platform is going to be scaled, it will be important to determine whether it requires any changes to adapt to the specific context in Guatemala and Honduras, whether the platform has any challenges that need to be fixed, and how much investment is needed to scale it. If a new platform is to be developed, a prototype would need to be created, tested and then a pilot should be launched and tested it.

5.2. AGGREGATING PRODUCTION

Farmers in Guatemala and Honduras have little market power and access to differentiated markets because most don't belong to cooperatives. Guatemalan and Honduran farmers produce a varied range of coffees, from low-quality Robusta to specialized micro-lots that sell at multiple times market price. Most unaggregated farmers, however, sell high-quality coffee to intermediaries at commodity market prices. The need for liquidity drives them to sell produce as soon as possible to whoever can pay the fastest, and to accept loans with

extremely high interest rates or, in some cases, agree to sell their produce to the lender at below-market prices.

By aggregating production, farmers could increase their bargaining power, scale, and access to markets, this would help them achieve higher and more stable prices.

Aggregating farmer groups could address farmers' urgent need for liquidity, and limited capacity to receive price premiums for quality by providing farmers financing services, access to premium markets, and offering more stable prices. This mechanism is typically seen among aggregated farmers with some ability to produce premium and differentiated coffees. Well-functioning cooperatives or farmer groups are already using the mechanism effectively. These include ACODIHUE and ASDECAFE in Guatemala and COMSA, Cocafelol, Cafico, and Aruco in Honduras. This mechanism might be easier to scale in Honduras where there are more well-functioning farmer groups, a larger range of types of coffee produced, and bigger scale of production.

Potential partners and roles

- **Donors and multilateral organizations:** Donors could support and showcase cooperatives already using aggregating resources as examples for others to follow, and support efforts to increase the accountability and transparency of cooperatives and/or farmer groups. This includes supporting existing efforts, like the work Neumann Foundation does in Guatemala and Honduras, and new efforts. More broadly, Guatemalan and Honduran farmer groups are unpopular among farmers because they are often perceived as corrupt and marginally additive. Donors could therefore support initiatives focused on strengthening farmer groups by implementing lessons learned from successful interventions. For example, Babban Gonna - a program in Nigeria that buys SHFs' produce, stores it, and sells it during peak prices - has been able to build strong relationships with farmers by supporting them all year round with services like trainings, access to finance, and sharing premiums for quality, resulting in a growth in their membership of 250 times in its first six years. Another successful example is Aldea Global, a Nicaraguan coffee cooperative, which has a strong governance structure, which has allowed it to become profitable and bring a lot of value to its members. The organization is divided into business units (e.g., inputs business, financial services). Every unit is managed independently and expected to be profitable through value-add interactions with members of the cooperatives.
- **Existing cooperatives and farmer groups:** Potential partners include existing cooperatives such as Fedecocagua or farmer groups like COMSA who are already using this model, which are well positioned to implement or scale these mechanisms as they have (i) a network of various producer groups whose products can be procured and sold at different premiums, (ii) the internal capacity to process coffee, and (iii) the ability to export directly to and negotiate with buyers.
- **International coffee buyers** that already buy their coffee in Guatemala (e.g., Nespresso) or Honduras (e.g., San Francisco Bay) and place value on direct sourcing from local groups;
- **National coffee associations:** such as ANACAFE, which is well positioned to discover new markets for Guatemalan coffee, or IHCAFE in Honduras
- **Financial institutions:** such as Root Capital, Oikocredit, and Banrural, which can provide loans to farmer groups that in turn offer financing options to their smallholder members.

Remaining questions and next steps

Additional research and analysis would be required to define whether to implement this strategy and how the program would look like. Key questions include:

- **Who should be targeted for this intervention?** Should the intervention focus on scaling already successful and well-managed farmer groups and helping them adopt or scale this model, or, should it focus on supporting farmer aggregation to reach farmers that currently not members of cooperatives? The trade-offs of these two potential approaches should be analyzed in detail to determine the path forward.
- **Who are the key partners?** We've outlined potential farmer organizations that, based on our research in Guatemala and Honduras, may be well-positioned to adopt or scale this strategy. However, there are numerous farmer groups that could use support to scale and adopt this model. Other implementing partners should also be identified, for example to provide training to cooperatives on managing risk, financial and business management, and governance, or to provide financial services to cooperatives, among others. For example, Oikocredit, Fair Trade USA, Keurig Green Mountain and Catholic Relief Services are working together to implement a project that equips 16 coffee producers' organizations in Honduras, Guatemala, Nicaragua, Colombia, and Peru with the skills and tools needed for price risk management best practices, including stock management and offset hedging.

5.3. STABILIZATION FUNDS

Most farmers in Guatemala and Honduras don't belong to farmer groups, and so a price stabilization fund is one solution that could in theory help mitigate price risk for most smallholder farmers, regardless of coffee quality and aggregation. This would be an expensive and complex solution, however that is likely to be problematic for several reasons, as detailed in previous sections of this report. A stabilization fund would have broad relevance to unaggregated and aggregated farmers, regardless of coffee quality. It would address the fundamental challenge of the unaggregated farmer's lack of access to PRMMs. Potential models for such a fund include Colombia's Incentivo Gubernamental para la Equidad Cafetalera (the recent price stabilization fund approved by the Colombian Congress) and a price stabilization fund in India for agricultural produce. (However, the extent to which these programs have been able to effectively address price volatility – or are expected to do so – have not been explored in this report. Without this information, the extent to which such solutions are feasible (and advisable) in practice is questionable.)

Before considering investing in a stabilization fund in Guatemala and Honduras, the serious questions outlined in previous sections of this assessment (discussing Price Stabilization and Supply Stabilization) should be carefully considered. Note that in this case, the government intervention in the market would not be a response to a market failure nor the government would be providing a public good. Investing in a stabilization fund only makes sense if (a) the industry is considered to be strategic for the country's economy because there are no other viable economic opportunities for farmers that could be more profitable, and (b) if the prices are expected to increase in the future. If these two conditions are not met, the fund becomes as perpetual subsidy financed by the government, whose funds may be better invested

in other ways. Coffee production plays an important role in the economies of Guatemala and Honduras and employs a significant number of people in rural areas, particularly in Honduras where coffee represents 4% of GDP and employs one million people. However, it is not fully known whether the international reference coffee prices will eventually be sufficiently high for farmers in these countries to break-even, which means the fund could become a subsidy for an extended period of time, and in fact could even provide a disincentive for farmers to shift to other types of production that could be more profitable

The **coffee price stabilization fund** and a **coffee productivity fund** could be funded with government funding, direct contributions, grants, and private sector investment. The former subsidizes farmers in times of low prices to help them weather the crisis while the latter finances projects to increase quality and productivity to make the industry competitive when prices recover. The funds would be separate because the price stabilization fund needs to accumulate capital to have sufficient resources to be used to subsidize prices when market prices fall below a pre-established threshold, while the productivity fund would function as a lending mechanism to improve the competitiveness of the sector. The productivity fund could be structured as a result-based finance to encourage private sector participation. The productivity fund would not be necessary if farmers can access other sources of finance at good rates.

The coffee price stabilization fund would subsidize the price difference for farmers if international prices dropped below a set threshold (to be defined based on the cost of production). It would be important to confirm that costs of production are low enough to ensure that coffee is profitable in most years. If costs of production make it impossible for coffee to be profitable in low coffee price and also high coffee price years, the fund will be a permanent subsidy from the government and/or will inhibit the profitability of the coffee sector as a whole, by keeping chronically uncompetitive producers incentivized to stay in coffee production. Alternatively, a fixed amount of money per pound of coffee sold could be defined if international prices fall below the threshold. Subsidy distributions could be paid through mobile money (donors could help set up / finance a mobile payment system similar to DaviPlata in Colombia).

The coffee productivity fund could take a different approach and engage in results-based finance. For example, private investment could be leveraged and paid back by donors if and when specific outcomes are achieved (e.g., productivity increased by X%, Y share of coffee produced is high-quality). Alternatively, the productivity window of the fund could be structured as a development impact bond (DIB), bringing together donors, private sector investors, and service providers to deliver finance based on attainment of specific results. For example, the Common Fund for Commodities (CFC), the Rainforest Foundation UK (RFUK), and the Schmidt Family Foundation (SFF) partnered in 2013 to develop a DIB to increase the productivity of coffee and cocoa producers in Peru.

There are several challenges to consider when designing a price stabilization fund. First, government-led initiatives limit the possibilities of partnering with the private sector—given that the purpose of the fund is to accumulate resources for times of crisis, and not to pay back investors. There are also limited options for investing the fund's assets, which need to be sufficiently liquid to respond to an unexpected crisis.

Second, such a fund would require significant capital, which could be put to alternative use that may be more productive. In a scenario in which the fund subsidizes the losses farmers incur when prices go below their break-even point, at current prices and export volumes, for example, the fund would need to disburse \$48 million per year in Honduras.⁴³ The public nature of such a fund could potentially be a challenge in Guatemala and Honduras, where the governments do not have a lot of resources. Moreover, the best-placed institutions to manage such a fund, ANACAFE in Guatemala and IHCAFE in Honduras, also have limited financial resources of their own to fund it and are already receiving contributions from farmers that are needed to fund their existing operations, which means that increasing these contributions would likely be politically unfeasible.

Third, there is a risk of incentivizing producers to neglect quality and/or stay in coffee when other alternatives might be more profitable. This mechanism risks distorting the local coffee market, and the agricultural sector more broadly by creating a minimum price. Ensuring the quality of coffee produced in the context of Honduras in particular is hard, given that most coffee flows through intermediaries that have few traceability systems in place. Results-based financing would be difficult to implement in this context as the money in the fund could not be invested in specific projects, and funding needs to be accumulated for an indefinite amount of time.

There are a number of key requirements for stabilization funds to succeed. Government must have strong capacity to set appropriate price thresholds, monitor prices, and respond to market changes. There must be a rapid and effective payment method in place to reach all smallholder farmers in a timely manner (e.g., mobile payments). The fund must have effective and transparent management and oversight, preferably by an external / independent entity. It must also employ an effective incentive scheme to avoid a scenario in which farmers produce lower-quality goods because of a guaranteed price threshold. Finally, the fund requires regular contributions to replenish it and ensure that it is sufficiently liquid in a time of crisis. Ideally, the cost of these contributions is borne by exporters and not passed through to the farmers, as current contributions to IHCAFE are. However, this would be hard to monitor and implement in practice.

Potential partners and roles

- **Donors and multilaterals:** could support the creation of a fund with two separate windows that could subsidize SHFs in times of low prices and provide capital to increase productivity. Such a fund would be established as an independent legal entity, be supervised by an independent third party, and pool capital from direct contributions, government resources, and grants. Donors would provide technical assistance in setting up the fund and defining its policies and would help to help attract grants / contributions from other development organizations. For example, a donor grant could serve as the initial endowment to start the coffee price stabilization fund. Direct contributions from farmers, producer groups and/or exporters would replenish the fund (e.g., through retentions on exports) and government funding—via institutions such as Ministry of

⁴³ Honduran producers' breakeven point is \$1 per pound while current international market prices \$0.95 per pound; in 2018, Honduras exported 965 million pounds of coffee. $965 \text{ million} \times \$0.05 = \sim \$48 \text{ million}$

Agriculture, National Bank, and IHCAFE / ANACAFE—would grow the endowment and maintain a minimum liquidity base.

- **National coffee association:** A third party with national reach should manage the fund and disburse it when needed. In the case of Guatemala and Honduras, the most likely partners would be ANACAFE and IHCAFE.

Remaining questions and next steps

Additional research and analysis would be required to define whether to implement this strategy and how the program would look like. Key questions include:

- **Who are the right partners?** This solution will require a strong implementing partner to manage the fund. The most relevant organizations to do so in Guatemala and Honduras are ANACAFE and IHCAFE, respectively. However, it is not entirely clear whether these organizations currently have the capacity to manage a fund like the one proposed. Therefore, additional analysis would be required to assess whether these two organizations are the right partners and if yes, what would be required to prepare them for the development and management of the fund.
- **How will the fund be structured?** Further analysis will be required to structure how the fund will work in practice. For example, how will it be funded, how big will it be, what are the outcome metrics for a results-based finance for the productivity fund.
- **Is this the best use of scarce government/donor/private sector resources?**
- Could the fund be designed so that it does not encourage producers to stay in coffee using low-cost, low-yield production practices (which are only profitable due to the subsidy) rather than shifting to alternative, more profitable alternatives?

5.4. OVER-THE-COUNTER CONTRACTS (OTCCS)

Considering that most farmer decisions in Guatemala and Honduras are based on short-term decision making, producers could reduce the price volatility they experience by signing long-term OTCCs⁴⁴, Aggregated farmers or those with access to formal intermediate buyers (either intermediaries or cooperatives) are positioned to benefit from this mechanism. Although OTCCs are most commonly used in differentiated coffee niches, they can also be employed in the bulk market.

Long-term OTTCs address several challenges faced by smallholder farmers in Guatemala and Honduras. One challenge derives from the tendency of value chain actors to engage in short-term decision-making. Despite converging interests, there is very little collaboration among actors to engage in mutually beneficial long-term relationships to stabilize prices. This is largely a result of high default / non-compliance rates from producers and intermediate buyers. Long-term OTTCs can establish and formalize these important relationships by designing contracts that can mitigate price risk for both buyers and sellers, making the contracts

⁴⁴ OTCCs are non-standardized contracts between value chain players where the price, volume, settlement method, and settlement date are negotiated and agreed upon by both parties. In this case, OTCCs refer to forward delivery contracts between producers and intermediate buyers, and between intermediate buyers and subsequent buyers.

mutually beneficial. They can also limit price volatility exposure because it avoids farmers making selling decisions in the short-term based on market prices.

Long-term OTCCs between value chain actors—such as those between the Nueva Esperanza del Bosque cooperative and buyers—guarantee beneficial pricing to producers for a certain volume of produce over a fixed time period. The long-term nature of the OTCCs (i) protects producers against price fluctuations and (ii) reduces incentives for the intermediate buyer and producer to default on OTCCs (a tendency that is currently limiting buyers' willingness to offer them). Buyers would be able to secure supplies/volumes at stable prices and to improve the traceability of their supply chains while **producers would benefit from hedging strategies if OTCCs are signed.**

For OTCCs to succeed as PRMMs, a number of requirements need to be met in Honduras and Guatemala..

Producer liquidity constraints (the need for immediate cash at harvest) need to be alleviated, as these often drive side-selling. Producers also need to understand the production costs of their farms and the revenue streams generated in order to knowingly commit to profitable OTCCs. Increasing the competition and competitiveness among intermediate buyers will reduce default on OTCCs, as will mechanisms to ensure that OTCCs are enforceable and noncompliance has consequences. Intermediate buyers must be trained in the use of financial derivatives and have access to the capital required for the investment. Finally, producers must have access to effective and reliable producer organizations, formal intermediaries, or exporter local buying hubs. Considering current market conditions in Guatemala and Honduras, it might be more viable to expand the use of this model initially in Honduras where there are more sophisticated cooperatives who are already using derivatives and may have the capacity and willingness to test the use of OTCCs.

The capacity of intermediate buyers to participate in this model will also depend in their capacity to access finance, and therefore, supporting the development of a financing facility would potentially increase participation. Investing in derivatives and OTCCs is expensive and the cost of

Spotlight: Beyond cooperatives, “intermediaries” can also be leveraged as intermediate buyers for OTCCs

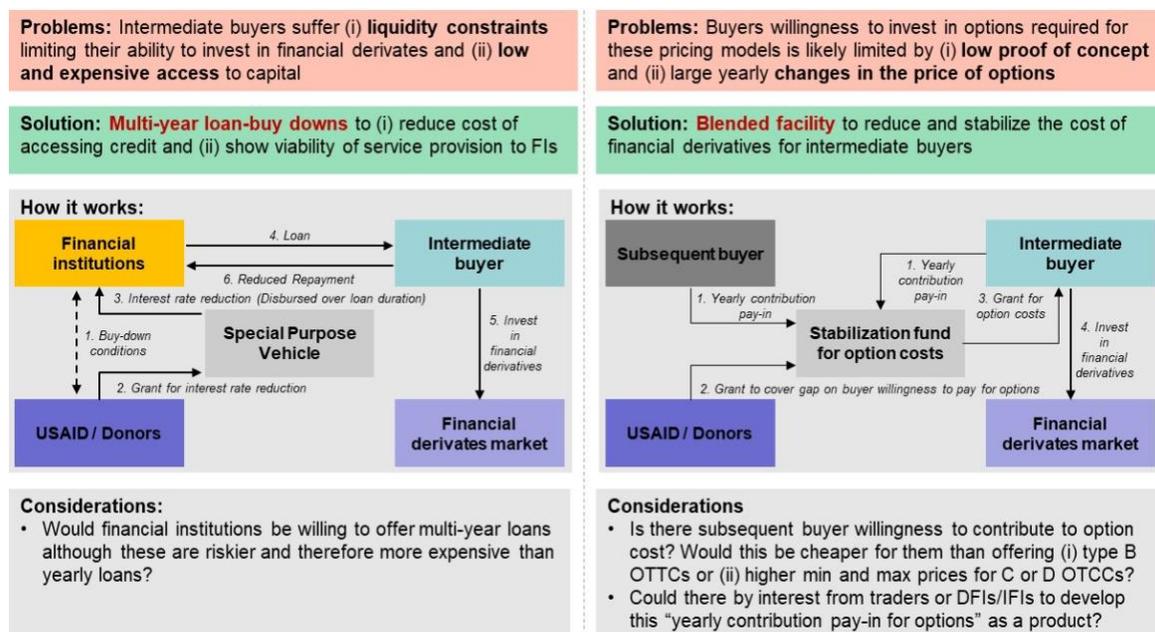
Intermediaries are often referred to as the “problematic” link in the value chain, but initiatives to increase their competition and competitiveness can be leveraged to promote access to OTCCs.

The Uganda Commodity Production Marketing (CPM) focuses on incentivizing intermediaries to improve relationships up- and downstream and building trust and win-win relationships between value chain actors to change processes and behavior. Clients (e.g., exporters, traders) choose a set of mid-sized intermediaries they work with and “buy” CPM services for them. CPM works with the intermediaries to train and empower them to extend services down the value chain to farmers. CPM services include training on business planning, financial management, and/or access to genuine physical products or credit. Farmers then benefit from services such as input provision and credit access from intermediaries.

Many exporters in Guatemala and Honduras already informally provide intermediaries with access to credit as a means of securing volumes/produce. However, the benefits of this do not trickle down to farmers. Some exporters, such as Unex Guatemala, already invest in mid-sized intermediaries to facilitate farmer access to essential services. It seems likely that there would be willingness among exporters to invest in similar CPM-like services to pilot OTCCs

derivatives is as volatile as coffee prices (the cost is often pegged to the underlying C Contract price). Given that cooperatives and intermediaries in Guatemala and Honduras face difficulties accessing finance, the cost of investing in OTCCs and derivatives can reduce the capacity and willingness of intermediate buyers to participate in OTCCs. Developing a financing facility that can help cover these costs, at least in the medium term while the concept is expanded to a broader set of coffee sector actors, could increase the willingness of intermediate buyers to participate. The financing facility could be set either as a multi-year long-buy down or a blended finance facility. The former would include creating a special purpose vehicle that allows intermediate buyers to access financing year after year, as needed, to cover the cost of investing in derivatives. The blended finance facility would require developing a fund, financed by donors or development finance institutions (DFIs), to provide low cost financing to intermediate buyers (Figure 11).

Figure 11. Financing options



Potential partners and roles

- **Donors and multilateral organizations:** these organizations can help show “proof of concept” for long-term OTCCs by collaborating to provide an enabling environment for them. A multipurpose program can provide “proof of concept” for how value chain players can benefit from long-term OTCCs. The program would provide a comprehensive service provision package to different actors to tackle the requirements simultaneously. *The objective will be for actors to gradually increase investment and for the program to become self-sustaining. In addition, donors or foundations could convene a broad range of actors, offer matched funding initiatives to drive in private investment, and develop a “credit guarantee” equivalent for OTCCs side-selling.*
- **Financial service providers:** E.g., Oikocredit, Root Capital to provide credit access to producers and intermediate buyers and to facilitate training on accessing and using financial derivatives

- **Intermediate and subsequent buyers:** E.g., Keurig Green, ECOM, OLAM to develop feasible OTCC arrangements and pilot them
- **Implementing NGOs:** E.g., Technoserve, Chemonics to develop alternative dispute resolution systems that promote compliance, and to facilitate trainings for producers and buyers on good business practices
- **Producers and producer organizations:** to adopt a value chain visibility app that reduces information asymmetry;

Remaining questions and next steps

Additional research and analysis would be required to define whether to implement this strategy and how the program would look like. Key questions include:

- **Who are the right partners?** Considering that most farmers in Honduras and Guatemala sell their coffee to intermediaries, it would be interesting to explore the feasibility of implementing OTCCs with intermediaries. This would require identifying well-managed and strong intermediaries that have interest and capacity to participate. Alternatively, existing cooperatives could be trained to : a) enhance their ability to provide useful services to members, and b) increase producer equity in the coop, to further incentivize commitment to the long-term contracts under this model, both when prices are high and low. Because the mechanism requires collaboration between different players, exporters willing to participate would also need to be identified. In addition, other partners to provide financing,
- **How will the OTCCs be structured?** Further analysis will be required to structure how the mechanism will work in practice. For example, how will the different pricing models be structured and when will the different options be used? How will the financing scheme be structured?
- **What is required for implementation?** This mechanism will require identifying and selecting the right partners, providing extensive training on using and providing OTCCs and derivatives, structuring the OTCCs and financing structures, and training farmers on OTCCs to ensure uptake.

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