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# Beyond the Passbook Relationship

**Assessing preferences for contracts among cotton and tea farmers and companies in Malawi**

Dennis O. Ochieng

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## ABBREVIATIONS

APES	Agricultural Production Estimates
CCM	Cotton Council of Malawi
CF	Contract Farming
EPA	Extension Planning Areas
FA	Farmers Association
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GoM	Government of Malawi
Kg	Kilogram
Km	Kilometer
KII	Key Informant Interview
MoAIWD	Ministry of Agriculture, Irrigation and Water Development
MOST	Malawi Oilseed Sector Transformation
MWK	Malawi Kwacha
TAMI	Tea Association of Malawi
WTA	Willingness to Accept
WTP	Willingness to Pay

## ABSTRACT

While contract farming provides opportunities to link smallholder farmers to markets, its sustainability depends on how the interests of both farmers and buyers are addressed. Previous studies analyze farmers' preferences for contracts, but buyers' preferences for contracts and design attributes are hardly examined. The author contributes to the knowledge gap by analyzing farmers' and buyers' preferences for contracts and design attributes, and the similarities and differences in preferences using a discrete choice experiment with 505 cotton farmers and 512 tea farmers in southern Malawi. Using a mixed logit model, the author examines farmers' and buyers' preferences and estimate farmers' willingness to pay for improvement of contract attributes. Results show that both farmers and buyers have positive preferences for contracts in general and for many design attributes. The author however observes clear differences in preference for payment mode where farmers prefer spot payments while buyers prefer delayed payments. Further, while both parties prefer better quality products, there are no standardized grading systems for the two crops in Malawi. Consequently, buyers are skeptical of farmers' ability to produce quality products while farmers are distrustful of buyers' grading systems. Even though buyers are open to offer contracts that provide inputs or insurance to farmers, there are no information sharing platforms to guide in contracting farmers thus exposing buyers to risks of contract default. The author also finds that farmers prefer contracts that address their social needs as seen in their choice of contracts with funeral expenses insurance. Such attributes could strengthen the relationship between farmers and buying companies. Sustainable contract schemes require designing contracts that are acceptable to both farmers and buyers by balancing risks between the parties. Successful contract relationships have to build business relationships and foster mutual trust by developing standardized grading systems and information sharing platforms for buyers and farmers to guide selection into the schemes. To minimize side-selling, companies can advance cash credit to liquidity constrained farmers, but this must be accompanied by stronger contract enforcement mechanisms.

**Keywords:** Contract farming, contract preferences, farmers, buyers, choice experiment, Malawi

# 1. INTRODUCTION

Contract farming (CF) refers to a pre-planting arrangement between farmers and buyers for the supply of agricultural products under agreed terms and conditions. The role of CF in linking small farmers to markets has increased significantly in developing countries in the past two decades, particularly in the procurement of export crops (Minten et al. 2009; Oya 2012). However, CF is also expanding in the domestic markets for agricultural products, especially fresh fruits, vegetables and staple crops (Maertens and Vande Velde 2017).

There are two broad strands of farmer-focused literature on CF. One examines the welfare impacts of CF while the other examines farmers' preferences for contracts. There is extensive literature on CF that shows mixed results on the contribution of CF to farm household welfare. This is attributed partly to the different contractual arrangements, design features, commodities, marketing and local context under analysis (Wang et al. 2014; Otsuka et al. 2016; Bellemare and Bloem 2018; Meemken and Bellemare 2020; Ragasa et al. 2018; Ruml et al. 2020). This paper contributes to a second strand of literature that is still largely under-researched. This strand focuses on contract preferences of farmers and buyers or companies (Abebe et al. 2013; Saenger et al. 2013; Ochieng et al. 2017). Literature on farmers' preferences for contracts is guided by the assumption that market imperfections increase transaction costs and that farmers' preferences for contracts are driven by the extent to which the forms of contractual arrangements lessen the costs (Holloway et al. 2000; Winters et al. 2005). However, with the rapid transformation of global agri-food systems, there is a shift from farmer- to buyer-driven value chains where buyers dictate the forms of market arrangements with farmers (Bijman 2008; Carrer et al. 2014; Mello and Paulillo, 2010; Vinholis et al. 2014; Feltre and Paulillo 2015). However, buyers' preferences for contracts remain largely unexplored.

In Malawi, CF is well established, particularly in the production of export crops such as tea, cotton, tobacco, green coffee and sugarcane (Kumwenda and Madola 2005; Mugwagwa et al. 2019). CF is also growing in the production of paprika and birds-eye chilies (Repar et al. 2017; Repar et al. 2018). Though on a small scale, there are pockets of CF schemes in the production of cassava, wheat and soybeans. The Government of Malawi (GoM) has developed a strategy to scale up CF to transform the small-scale farm sector (MoAIWD 2016).

This study utilizes data from cotton and tea CF schemes in Malawi. The GoM prioritizes the two crops for scale up in both the CF strategy and the National Agriculture Investment Plan due to significant employment potential for small farmers in the schemes (MoAIWD 2016; Benfica and Thurlow 2017). The author employs a choice experiment to elicit the stated contract preferences of both companies and farmers. The experimental design uses a combination of existing contract attributes as stipulated in the passbooks<sup>1</sup> and hypothetical contract attributes whereby 505 cotton farmers and 512 tea farmers chose their preferred marketing options. Half of the sampled cotton and tea farmers were randomly selected from company lists of contracted farmers while the non-contracted farmers were randomly selected from locations where the two companies had not contracted farmers. The author also analyzes companies' preferences for contracts and design attributes. This approach is less costly to implement than the large-scale field experiments approach where variations of numerous design attributes are evaluated (Saenger et al. 2013; Saenger et al. 2014).

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<sup>1</sup> A passbook is a contract document issued to farmers by companies, stipulating contract terms and conditions. Farmers are expected to record all transactions with the company in the passbook to track their payments and for companies to monitor their performance in terms of output, yields, quality of products, and loan repayment.

It is not yet clear how variations in contract design influence smallholder participation in contracts. Examining the preferences helps to understand risk attitudes of farmers and how risks influence farm-level decision making (Hueth and Hennessy 2002). Furthermore, studies that analyze farmers' preferences for contracts mainly focus on production-related farmer support in terms of material inputs but do not include non-production related attributes that meet social needs of farmers such as funeral insurance cover. Yet including such contract attributes can strengthen the business relationship between farmers and buyers and facilitate farmer retention in CF schemes.

The author's contribution to literature on CF is threefold. First, the author analyzes buyers' and farmers' preferences for contracts. Second, the author examines similarities and differences in buyers' and farmers' preferences for contracts. To the best of my knowledge, this is the first study to do this using a choice experiment. Lastly, this study tests the influence of attributes that address social needs of farmers on their choice of agricultural contracts. The author includes crop insurance and funeral expenses insurance as part of the farmer support attribute levels in contract options.

This study addresses the following research questions: (1) What are the farmers' preferences for contracts for cotton and tea farming? (2) What are the companies' preferences for contracts for cotton and tea farming? (3) What are the similarities and differences in contract preferences of farmers and companies for cotton and tea farming?

The paper proceeds as follows: Section 2 provides an overview of cotton and tea farming in Malawi. Section 3 details the sampling procedure, data, the choice experiment design and empirical strategy employed. Section 4 discusses the findings. Section 5 concludes with policy implications.

## 2. OVERVIEW OF COTTON AND TEA FARMING IN MALAWI

### 2.1. Cotton farming in Malawi

Cotton, a traditional cash crop in the low-lands and lake regions, is the fourth largest export earner for Malawi (Magombo et al. 2013; Kenamu and Phiri 2014). The crop is grown by about 81,000 farmers from 18 districts in Malawi. More than one-half of the cotton farmers farm in Chikwawa district (Cotton Council of Malawi, 2019). Prior to market liberalization in the 1990s, ginned cotton was mostly marketed domestically but this changed post-liberalization with a significant reduction in number of textile factories. Most of the seed cotton is now ginned and exported as lint (Kumwenda and Madola 2005).

Cotton production continues to experience challenges such as reduced number of producers and land allocation to cotton, use of low yielding seed varieties, high input costs, uncoordinated marketing infrastructure, weak and unenforceable contractual arrangements between farmers and buyers, and stiff competition from cheap imports and globally decreasing cotton prices. Production challenges are further compounded by increased climatic variability and change. Coupled with declining prices, this has led to a reduction in the number of ginners from 12 in 2015 to 4 by 2019 (Cotton Council of Malawi 2019). Table 1 provides a summary of nationwide cotton production trends for the past nine seasons in terms of number of producers, hectarage of cotton, yield and output. The number of producers, hectarage of cotton and production increased significantly between 2009/10 and 2011/12 seasons and declined thereafter. However, cotton production and yield has picked up since the 2017/18 season. However, ginners are operating at less than 20 percent capacity, considering a ginning capacity of 450,000 MT (Cotton Council of Malawi 2019).

**Table 1. Nationwide cotton production trends across seasons (2009/10 to 2016/17)**

Season	No of producers	Area (ha)	Yield (kg/ha)	Production (MT)
2009/10	102,761	30,785	947	29,165
2010/11	147,500	59,626	882	52,598
2011/12	363,000	240,000	416	100,000
2012/13	352,000	172,952	243	42,000
2013/14	341,926	149,259	308	46,000
2014/15	300,000	123,019	406	50,000
2015/16	200,000	87,000	172	15,000
2016/17	105,000	41,000	146	6,000
2017/18	-	40,613	529	21,489
2018/19	-	42,652	626	26,716
2019/20 <sup>a</sup>	-	36,651	1,429	52,382

**Source:** Ministry of Agriculture Irrigation and Water Development (2019).

**Note:** ha = hectare; Kg = kilogram; MT = metric ton; <sup>a</sup> First round of Agricultural Production Estimates (APES).

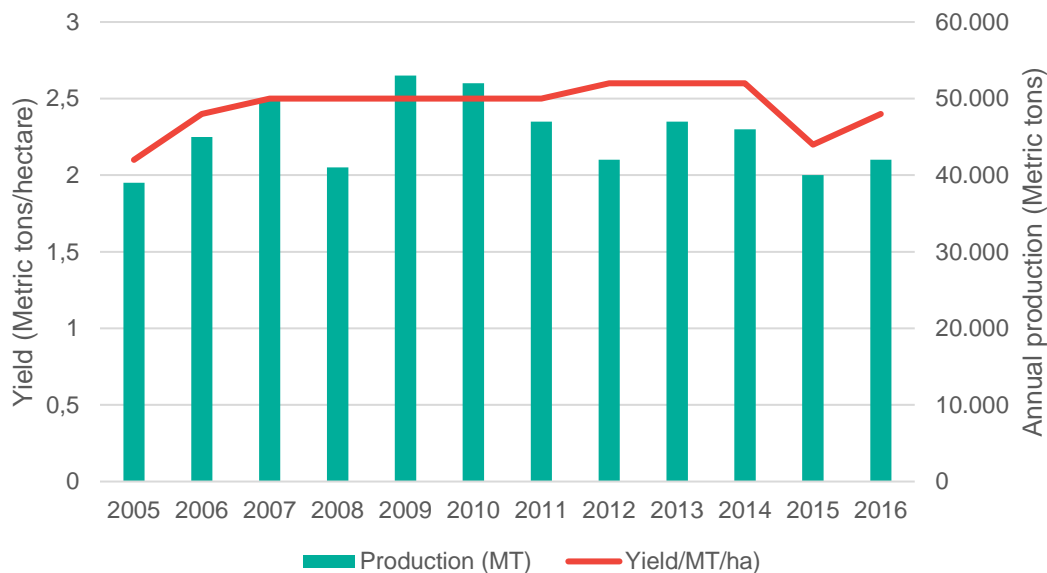
In 2019, GoM launched a program to revive the cotton production through the Cotton Council of Malawi. The focus is to provide high yielding and drought-tolerant seed varieties to farmers and to set minimum farm gate prices for two grades of cotton: grade A for top quality and grade B for lower quality. Quality is based on cosmetic appearance of cotton bolls. Grade A refers to clean cotton bolls devoid of foreign materials while grade B refers to discolored bolls with traces of foreign materials. However, the quality grades are not standardized and vary by ginner. Cotton is marketed through contracts, spot markets or hybrids of contracts and spot markets. Contracts typically come in the form of production contracts where farmers are provided with inputs on credit (e.g., seeds, crop chemicals, fertilizers, cash credit). Input costs are then deducted from sales to the companies. The terms and extent of such services vary across companies.

The prices of inputs provided by the companies are often slightly higher than the market prices because the companies incur costs of procurement and distribution of inputs to farmers. Companies sometimes facilitate farmers' access to credit from microfinance institutions at market rates with the contract value as guarantee. Companies specify minimum volumes to be supplied and the prices per kg of cotton in their contracts. However, the Cotton Council of Malawi fixes minimum farm gate prices of cotton that are often higher than pre-season prices stipulated in contracts. Cotton prices are usually fixed prior to harvest (Cotton Council of Malawi 2019). CF in cotton has faced many challenges with widespread side-selling and input diversion by farmers leading many companies to abandon contractual arrangements with farmers (Cotton Council of Malawi 2019).

## 2.2. Tea farming in Malawi

Malawi is one of the largest tea producers in Africa after Kenya. Tea (*Camellia sinensis*) is second only to tobacco in terms of export earnings. Malawi mostly produces crash-tear-curl black tea and some green tea. The crop is mainly grown in Thyolo and Mulanje districts in the Southern region and to a lesser extent in Nkhata Bay in the North. Estate run factories manage processing and packaging while marketing is largely concentrated in Thyolo, Blantyre and Mulanje districts. The tea industry directly employs about 50,000 workers and is a source of livelihood for more than 17,000 smallholder producers (du Toit et al. 2018). The crop is grown on about 18,000 ha with commercial estates accounting for 89 percent and smallholders accounting for 11 percent of the total hectareage (FAO 2014). Commercial estates account for 93 percent of total tea production and smallholders contribute about 7 percent. The tea yield was stable between 2006 and 2015 before declining in 2015 (Figure 1). The tea estates have low-yielding old plantations, which they continue to replace. Replacement is however limited due to the costly investment required and increased competition by the more profitable Macadamia (du Toit et al. 2018).

**Figure 1. Tea production and yield trends (2005–2016)**



**Source:** du Toit et al. (2018).

The replacement of old plantations presents a great opportunity for smallholders to fill the production gap. Tea processors (estates) continue to procure the crop from smallholders through a variety of coordination mechanisms including contracts, spot markets and hybrids. Contractual arrangements with farmers vary by contractor and are largely informal. The development of pluralistic governance structures by agro-processors is driven by ambiguity and their strategic behavior (Mugwagwa et al. 2019). In some cases, companies provide farm inputs e.g., crop chemicals, fertilizers and plantings, extension services, or credit to promote farmer retention in the schemes and ensure enough quality supplies. Other companies also offer corporate social responsibility projects where contract scheme members access free medical services and education in company-run facilities.

Tea is traded in two qualities: The superior pre-processed grade A refers to tea with two leaves and a single bud while any harvested tea not fitting this description is considered grade B. Tea prices are set

pre-season in contracts and are often slightly lower than the market prices. Despite the services provided to farmers, companies continue to experience high farmer attrition in contract schemes with incidences of contract breach, poor quality supplies, side-selling and input diversion, partly due to stiff competition among buyers. Inputs such as fertilizer are diverted to maize fields. The Tea Association of Malawi (TAMI) is working with the government to tackle these challenges including an attempt to design standard contracts and contract enforcement mechanisms. The influence of contract design on companies' and farmers' preferences for contracts has not been examined.

## 3. METHODOLOGY

### 3.1. Data

The study uses data collected from a one-round of choice experiment and a survey of smallholder cotton and tea farmers and companies, and key informant interviews (KIIs) with officials of farmers' associations during June and July 2019. Interviews were conducted using semi-structured questionnaires. For farmer interviews, a multi-module questionnaire covered farm household demographic and economic characteristics, on-and off-farm activities, asset endowments, tea or cotton marketing and contractual arrangements, side-selling in contract schemes, social networks, food and nutrition security, household shocks and a choice experiment section to examine farmers preferences for contracts as described in the following discussions. The questionnaire for KIIs covered the general cotton or tea marketing environment, side-selling in contract schemes, the role of farmers associations or regulating authorities in commodity marketing, and a section on choice experiment. Prior to the surveys, questionnaires were translated from English to local language and pre-tested during pre-field visits in May 2019.

#### 3.1.1. Farm household survey

The farm household surveys for cotton and tea farmers were conducted from June to July 2019 in Chikwawa and Mulanje districts respectively. A multi-stage sampling procedure was used to sample farmers. The author purposively selected Chikwawa and Mulanje districts as the main cotton and tea producing areas. Chikwawa contributes 75 percent to the national cotton production according to Agricultural Production Estimates (APES) from the Ministry of Agriculture, Irrigation and Water Development (MoAIWD) (MoAIWD 2018) and Mulanje contributes about 60 percent of total tea output. For cotton, the author sampled the only company that was still contracting farmers by 2018 as others had either wound up or stopped contracting. The company also had a wider geographic coverage and intended to recruit more smallholder farmers to supply cotton in the future. For tea, one of the six tea companies in Mulanje was selected as it supported the largest tea farmers trust, contracted many smallholder farmers across a wider geographic area and intended to contract more smallholder farmers to off-set the volume deficits from replacement of older tea plantations. The volume of tea supplied by smallholder farmers to the company had increased from 41 percent in 2013 to 66 percent by 2017.

The author obtained a list of contracted farmers from these companies, and of non-contracted farmers from the district agricultural extension office, disaggregated by extension planning areas (EPAs) for cotton producers and by contract administration units (blocks) for tea producers. Table 2 presents a summary of the sample by commodity. For cotton, the author sampled 5 EPAs (Dolo, Mikalango, Mitole, Mbewe, and Livunzu) and used proportionate to size sampling procedure to sample 251 contracted farmers from 14 villages and 254 non-contracted farmers from other 15 villages. In total 505 cotton farmers were surveyed.

To sample tea farmers, 5 of the 21 blocks (Nansula, Chanunkha, Namame, Zambakoma, and Kangaza) were randomly selected and then 257 contracted farmers from 13 villages and 255 non-contracted farmers from other 13 villages were randomly sampled proportionate to the size of the block. In total, 512 tea farmers were surveyed.

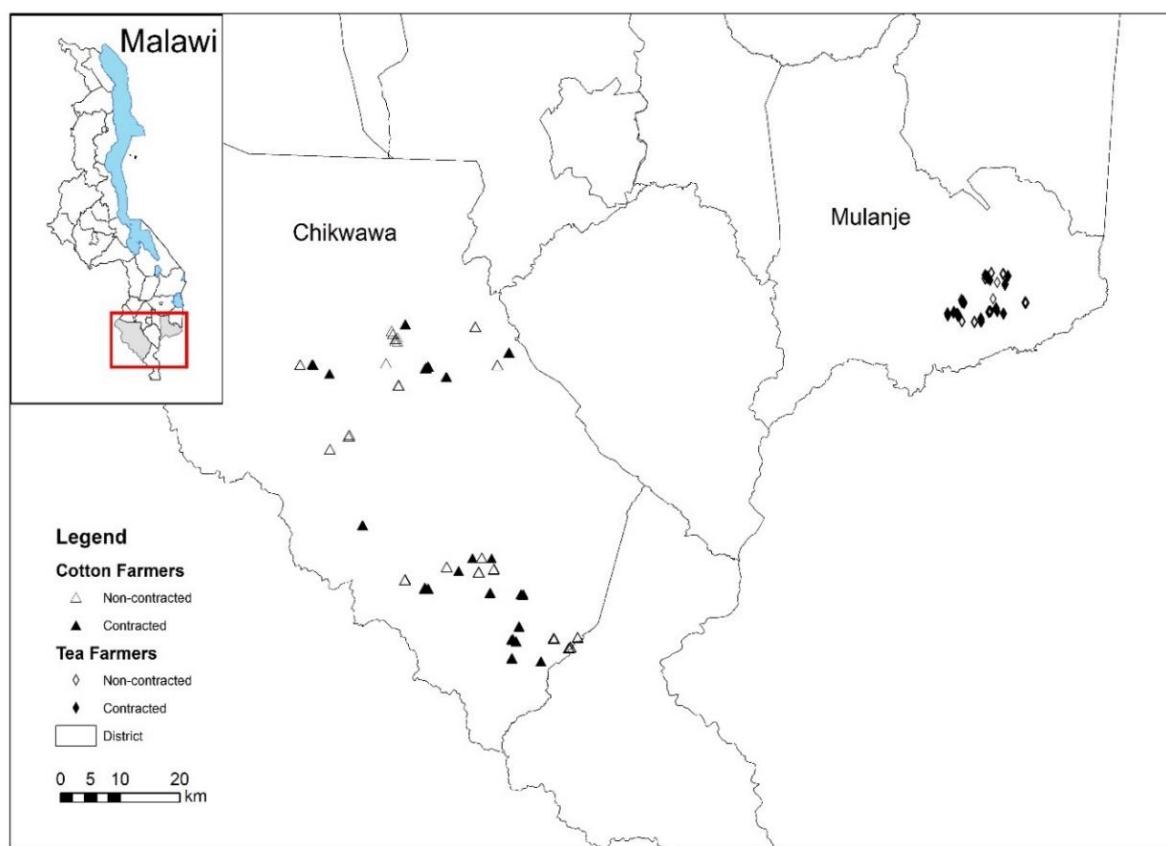
**Table 2. Number of surveyed cotton and tea farmers**

Farmer type	Cotton	Tea
Non-contracted	254	255
Contracted	251	257
<b>Total</b>	<b>505</b>	<b>512</b>

Source: IFPRI farm household surveys (2019).

While contracted and non-contracted cotton and tea farmers were sampled from separate villages, these villages were comparable in terms of agroecology and access to infrastructure e.g., roads, water, electricity, agricultural extension, markets or collection points of contracted crop, etc. Figure 2 shows the geographic distribution of the sampled smallholders by contract status. Overall, the samples of contracted and non-contracted farmers were comparable as will be shown in the descriptive statistics in the results section.

**Figure 2. Geographic distribution of contracted and non-contracted farmers**



Source: Authors' construction.

### 3.1.2. Key informant interviews

The study also entailed assessing preferences for contracts among buyers of cotton and tea. Key informant interviews were therefore held KIIs with 6 officials from cotton companies and 5 officials of tea companies. The officials were typically the outgrower contract managers. Separately, 14 KIIs took place with officials of cotton farmers associations and 5 KIIs with tea farmers associations officials. In addition, a similar choice experiment was conducted with contract managers to examine their preferences for contracts in general and the contract design attributes. The managers were also asked to provide reasons for their contract preferences as will be explained in the following discussion. Finally, KIIs were held with one official of the Cotton Council of Malawi (CCM) and Tea Association of Malawi (TAMI) to understand the cotton and tea regulatory environment.

### 3.1.3. Choice experimental design

Prior to designing the choice experiments, focus group discussions (FGDs) were held with farmers and KIIs with officials of farmers associations and companies to qualitatively determine the (potential) contract attributes in both the cotton and tea contract schemes. This helped in designing choice experiments that incorporated a combination of real and hypothetical attributes. Table 3 presents the five attributes used for the experiment and their levels.

The first attribute, **price**, was measured in Malawi Kwacha (MWK) per kilogram (kg) and had six levels ranging from 1 (lowest) to 6 (highest) based on the reported lowest and highest prices. Cotton prices are set by the Cotton Council of Malawi in consultation with other industry players and that price is reflected in the minimum farm gate prices set by MoAIWD at the beginning of the harvest season. This minimum price is usually lower than that offered by other buyers due to stiff competition for cotton amid low production levels in Malawi. Tea prices however vary across buyers in Malawi depending on the bargaining power of individual farmers or the farmers organizations. The lowest and highest prices reported in the period preceding the survey were MWK300/kg and MWK375/kg for cotton respectively, and MWK120/kg and MWK145/kg for tea.

The second attribute was **delivery point** with three levels. There were options to either (1) sell or buy at farm gate, (2) buyers' collection point or (3) buyers' premises. While the farm gate is the main delivery point particularly for vendors, the other two options are common under contractual arrangements where farmers incur substantial transaction costs. Contracted farmers usually transport the products to the nearest buyer collection points while non-contracted farmers sell at the farm gate to middlemen or company agents or at buyers' premises.

The third attribute, **quality**, included two levels of commodity grades. Grade A was the highest quality fetching higher market price while grade B designated average quality. In Malawi, quality grades are not standardized and are subjectively assessed by buyers.

The fourth attribute was **payment mode** with three levels – (1) spot payment and delayed payment by either (2) two weeks or (3) more. It has been acknowledged that this attribute influences farmers' preferences for contracts (Ochieng et al. 2017). The mode of payment captures a trade-off in preferences due to timing of payment. Cash-strapped farm households usually opt for spot payments for consumption smoothing (Brown et al. 2011).

The last attribute was **benefits**, which referred to accruing benefits beyond the payments for deliveries under a contract. This attribute had five levels ranging from 1 (no other benefit) to variant benefits including funeral expenses insurance for farm household members (levels 2 and 3), crop insurance (level 4) and provision of farm inputs (level 5). The insurance packages had earlier been piloted among cotton farmers under the Malawi Oilseed Sector Transformation (MOST) project.<sup>2</sup> Agricultural production in Malawi continues to be adversely affected by the frequent pest attacks, climatic changes and variability (i.e., prolonged dry spells), and excess precipitation that reduce yields significantly (Hochrainer et al. 2009; FEWS NET 2018). Crop insurance can cushion farmers against farm-level production risks (Hazzell and Hess 2010; Jensen and Barrett 2017; Mishra et al. 2018). Various modalities have been implemented in Malawi (Suarez and Linnerooth-Bayer 2010; Syroka and Nucifora 2010). While insurance attribute levels were new to the tea schemes, company officials were open to include them in contracts.

**Table 3. Contract attributes and corresponding levels**

Attributes	Cotton choice card levels	Tea choice card levels
<b>1 Price</b>	1 Cotton council price (MWK300/kg)	Market price (MWK120/kg)
	2 Cotton council price + MWK15/kg	Market price + MWK5/kg
	3 Cotton council price + MWK30/kg	Market price + MWK10/kg
	4 Cotton council price + MWK45/kg	Market price + MWK15/kg
	5 Cotton council price + MWK60/kg	Market price + MWK20/kg
	6 Cotton council price + MWK75/kg	Market price + MWK25/kg
<b>2 Delivery point</b>	1 Farm gate	Farm gate
	2 Buyers' collection point	Buyers' collection point
	3 Buyers' premises	Buyers' premises
<b>3 Quality</b>	1 Grade B	Grade B
	2 Grade A	Grade A
<b>4 Payment mode</b>	1 Spot payment	Spot payment
	2 Delayed for 2 weeks	Delayed for 2 weeks
	3 Delayed for more than 2 weeks	Delayed for more than 2 weeks
<b>5 Benefits</b>	1 No other benefit	No other benefit
	2 Funeral insurance for farmer + spouse	Funeral insurance for farmer + spouse
	3 Funeral insurance for 4 family members	Funeral insurance for 4 family members
	4 Weather index insurance cover	Weather index insurance cover
	5 Farm input provision (seeds/inoculant/credit)	Farm input provision (seeds/fertilizer/credit)

**Source:** Authors' construction.




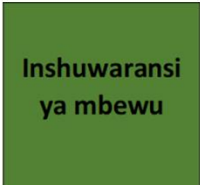







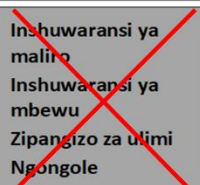
**Note:** MWK = Malawi Kwacha; Grade A = Superior grade; Grade B = Lower grade.

<sup>2</sup> MOST partnered with NICO Insurance Ltd. to provide funeral expenses and seed insurance to farmers in the study area. For 400 kg of cotton supplied, a farmer, spouse and two children were insured for up to MWK85,000. For 240 kg, only the farmer was insured for MWK75,000.

The five attributes and their corresponding levels yield 540 ( $6^1 \times 3^2 \times 2^1 \times 5^1$ ) possible choice combinations under D-optimal design (using *R-studio*). However, these choices are too numerous to ask respondents due to possible cognitive burden (Hensher et al. 2005). Hence, the author used a fractional factorial design that maintains the first order effects to develop a subset of the full factorial design yielding thirty choice sets (or cards). The choice cards were then split into five blocks and each respondent was randomly assigned to only one block. Each of the six choice cards in a block had three options. The first two options mirrored contractual arrangements in the contract schemes while the third was the opt-out option that mirrored the status quo of a no-contract scenario.

Enumerators were provided with choice experiment guides with detailed explanations of the attributes and levels. In addition, a sample of choice cards was used to explain to respondents the three options. The author developed unique pictures for each attribute level for better understanding of the trade-offs between the choice options. Figure 3 shows a sample of a choice card used in the experiment with cotton farmers.

**Figure 3. Sample of a choice card used in the experiment with the cotton farmers**

	Price	Delivery point	Quality	Payment mode	Benefit
Option 1				Malipiro a pompopompo	
	MWK345/kg	Factory premises	Grade B	Spot payment	Crop insurance
Option 2				M'masabata awiri	
	MWK345/kg	Nearest collection	Grade A	Within 2 weeks	Inputs and/or credit
Option 3				Malipiro a pompopompo	
	MWK300/kg	Sell at Farmgate	Grade B	Spot payment	No other benefit

Source: Authors' construction.

## 3.2. Empirical strategy

### 3.2.1. Examining general preference for cotton and tea marketing contracts

The author first models choice as a function of contract attributes only in equation 1 as follows.

$$Y_{njt} = \alpha_n AC + \beta PR_{njt} + \rho'_n AT_{njt} + \varepsilon_{njt} \quad (1)$$

Where the binary outcome  $Y$  equals 1 if farmer  $n$  chooses alternative  $j$  given choice task (options)  $t$ .  $PR$  refers to commodity price while  $AT$  is a vector of the remaining four attributes (delivery point, quality, payment mode, and benefits).  $AC$  refers to the alternative-specific constant that captures the general preferences for contracts apart from the attributes. The author dummy coded the base scenario, assuming a value of 1 for the opt-out option and 0 for contract options. This means that a negative coefficient implies a positive attitude towards contracts and vice versa.

### 3.2.2. Farmers' willingness to accept contract design attributes

To quantify the trade-offs between the contract attributes, the author analyzed respondents' willingness to pay for improvements in the contract attribute levels. Willingness to Accept (WTA) is a partial derivative of price with respect to the contract attributes. The author first reorganizes equation 1 to determine price as follows:

$$PR_{njt} = \frac{\{Y_{njt} - \alpha_n AC - \rho'_n AT_{njt} - \varepsilon_{njt}\}}{\beta} \quad (2)$$

WTA is therefore derived as follows:

$$WTA = \frac{\partial PR}{\partial AT} = -\frac{\rho'_n}{\beta} \quad (3)$$

A positive value, expressed in MWK, implies acceptance of an attribute level conditional to a higher price. Higher values would therefore indicate that respondents consider the attribute levels critical when evaluating contract choice.

### 3.2.3. Examining similarities and differences in preferences for contracts

The author analyzes the common attributes preferred by both the farmers and companies. This is critical in designing optimal contracts that balance risks between contracting parties (Ochieng et al. 2017). The author compares the preferences of farmers and companies descriptively and summarize explanations given by farmers and companies for prioritizing certain contract attributes. The author used Stata (version 16) for all statistical analyses.

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive statistics

Table 4 compares selected variables between contracted and non-contracted cotton and tea farmers. The author begins by discussing the profile of cotton farmers followed by tea farmers before highlighting the similarities and differences in their profiles. Most of the household heads were male (91 percent), 47 years old and with six years of formal schooling on average. Mean family size was 5.5 members. The mean area of land owned was about 5 acres of which 45 percent was allocated to cotton production. On average, cotton farmers had 21 years of farming experience and 18 years of experience in farming cotton. Farmers generally practiced mixed farming, cultivating several crops and rearing livestock (87 percent). Chikwawa is a semi-arid district and farmers practice mixed farming to reduce farm-level production risks and guarantee household food security.

About 61 percent of farmers were members of a farmer group or farmers association. In terms of proximity to agricultural extension services and markets, the distance from their homesteads to the nearest extension office was about 6 kilometers (km) for cotton farmers whereas the distance to the nearest market was 2 km. In terms of income, most farmers had diversified incomes with about 95 percent earning income. Off-farm income comprised income from non-farm businesses, occupation and remittances, although a few cases of remittances were also reported. Farm income was the sum of net crop and livestock incomes while total income was made up of farm and off-farm incomes. Average farm income was MWK299,000 and total income amounted to MWK458,220. Hence, on average, farming contributed about two-thirds (65 percent) to overall farm household incomes.

In terms of differences between contracted and non-contracted cotton farmers, contracted farmers were more educated, owned more land and allocated higher shares of their land to cotton. More contracted farmers kept livestock and were members of a farmers group. Interestingly, there were no statistically significant differences in access to extension services and markets, or in farm incomes. However, the proportion of poor farm households was significantly lower than for non-contracted households by 23 percent. Households that earn less than MWK164,000 annually are classified as poor (World Bank 2019).

Like the cotton farmers, most tea farm households were male headed. The household heads were about 46 years and had six years of formal schooling. On average, farm households comprised 5 members. Tea farmers owned about 2 acres of land with most of it allocated to tea production (99 percent). Tea farmers had 17 years of farming experience and 12 years of experience in tea farming. About 64 percent of farmers kept livestock. In terms of proximity to extension services and markets, the distance from the homesteads to the nearest extension office and market was 4 km and 6 km, respectively. Most of the tea farmers also earned income from off-farm activities (96 percent). Farm income and total income was MWK106,380 and MWK345,810 respectively. Hence, farm income contributed only about 31 percent to the total income. In terms of differences between contracted and non-contracted tea farmers, contracted farmers were older and with more years of experience in general farming and in cotton production. The proportion of contracted farmers who were members of a farmers group was also higher. The proportion of poor farm households was 4 percent lower for contracted than for non-contracted farmers

In terms of differences between cotton and tea farmers, the proportion of male headed households was higher among cotton than tea farmers. Cotton farmers owned more land than the tea farmers and had

more years of farming experience as well in farming the contracted crop. More cotton farmers also owned livestock and were members of a farmers group than tea farmers. Interestingly, farm income contributes more to the total income of cotton farmers (65 percent) than tea farmers (31 percent). Overall, per capita income of cotton farmers was higher than that of tea farmers. The proportion of poor farm households was 4 percent higher for tea than for cotton farmers.

**Table 4. Descriptive statistics**

Variables	Cotton farmers				Tea farmers			
	Full sample (n=505)	Contracted (n=251)	Non-contracted (n=254)	Diff	Full sample (n=512)	Contracted (n=257)	Non-contracted (n=255)	Diff
Male household head (1,0)	91.07 (1.27)	90.51 (1.84)	91.63 (1.75)		67.77 (2.07)	64.59 (2.99)	70.98 (2.85)	
Age of household head (years)	46.98 (0.65)	47.82 (0.90)	46.15 (0.94)		45.60 (0.68)	47.05 (0.95)	44.13 (0.96)	**
Education of head (years)	6.06 (0.17)	6.34 (0.24)	5.77 (0.23)	*	6.12 (0.16)	6.01 (0.23)	6.23 (0.22)	
Family size (number)	5.47 (0.08)	5.64 (0.12)	5.30 (0.11)	**	4.54 (0.07)	4.59 (0.10)	4.48 (0.11)	
Land owned (acres) <sup>a</sup>	4.92 (0.14)	5.19 (0.23)	4.65 (0.16)		1.78 (0.05)	1.87 (0.07)	1.68 (0.08)	*
Share of cotton area	0.45 (0.01)	0.48 (0.02)	0.41 (0.01)	***	0.99 (0.00)	0.99 (0.00)	0.99 (0.00)	
Farming experience (years)	20.78 (0.58)	20.72 (0.81)	20.88 (0.83)		17.48 (0.55)	18.14 (0.78)	16.81 (0.77)	
Cotton farming (years)	18.05 (0.56)	18.40 (0.80)	17.70 (0.79)		12.15 (0.45)	13.17 (0.67)	11.13 (0.59)	**
Group membership (1,0)	61.19 (2.17)	71.71 (2.85)	50.79 (3.14)	***	53.71 (2.21)	75.10 (2.70)	32.16 (2.93)	***
Distance to extension office (km)	5.84 (0.30)	5.74 (0.41)	5.95 (0.44)		3.89 (0.21)	4.45 (0.31)	3.34 (0.26)	***
Distance to nearest market (km)	2.43 (0.13)	2.67 (0.21)	2.19 (0.17)		5.46 (0.25)	5.36 (0.30)	5.55 (0.41)	
Off-farm income (1,0)	94.84 (0.99)	94.42 (1.45)	95.26 (1.34)		96.29 (0.84)	96.11 (1.21)	96.47 (1.16)	
Farm income ('000'MWK)	299.34 (103.26)	296.67 (42.85)	302.00 (201.47)		106.38 (10.28)	118.74 (14.96)	93.93 (14.09)	
Off-farm income ('000'MWK) <sup>b</sup>	158.88 (14.30)	200.14 (26.59)	117.94 (10.18)	**	239.43 (49.92)	186.91 (19.04)	292.35 (98.36)	
Total income ('000'MWK)	458.22 (105.36)	496.81 (51.27)	419.94 (203.81)		345.81 (51.27)	305.65 (26.12)	386.28 (99.57)	
Total income per capita ('000'MWK)	98.68 (26.11)	96.10 (9.82)	101.24 (51.15)		93.97 (16.95)	80.89 (8.61)	107.17 (32.92)	
Poor households (1,0)	0.45 (0.02)	0.33 (0.03)	0.56 (0.03)	***	0.49 (0.02)	0.47 (0.03)	0.51 (0.03)	

Source: IFPRI survey (2019).

Note: km = Kilometer; MWK = Malawi Kwacha; Standard error in (parentheses). \*, \*\*, and \*\*\*= mean differences between contracted farmers and non-contracted farmers (Diff) are significant at the 10%,5%, and 1% levels, respectively; <sup>a</sup> land sizes varied and were converted to acres to facilitate comparison; <sup>b</sup> Off-farm income included incomes from non-farm business, remittances, and occupation. Poor households refer to households that earned less than MWK164,000 annually; 1 US Dollar = MWK740.

## 4.2. Farmers' preferences for contracts

Table 5 presents pooled maximum likelihood estimates obtained using a mixed logit model. Most of the mean parameters are statistically significant from the base category at the 1, 5 or 10 percent levels and have expected signs. This implies that contract attributes are important to farmers when making contractual arrangements with buyers. The coefficient of alternate specific constant is negative and significant, meaning that *ceteris paribus*, farmers have a positive attitude towards contracts. The coefficients of other parameters are interpreted relative to the base category, which is the non-contract option. This option was constant in all the choice cards presented to farmers.

Looking at the delivery points attributes, results show that farmers generally prefer to either deliver the products at the buyer's collection point or buyer's premises relative to collection of the products at the farm gate by the buyer. This is contrary to our expectation that farmers would prefer farm gate collection to reduce the transportation costs. However, this is not surprising given that cotton farmers were organized into clubs and tea farmers into groups (associations) to facilitate collectivized marketing which reduced transportation and transaction costs of deliveries to collection points.<sup>3</sup>

On product quality, both cotton and tea farmers were generally willing to contract for better quality product (grade A) relative to lower quality product (grade B). This is plausible, given that grade A fetches better prices than grade B and in a competitive market like Malawi, buyers pay premia for higher quality. However, quality grading was a challenge as mentioned during the farmer surveys and KIIs with farmers association officials. No standardized grading systems exist for cotton and tea, and buyers often determine the grades without farmers' affirmation. Looking at payments, farmers generally dislike contracts with delayed payments after sales and prefer spot payments instead. This is plausible in the context of liquidity constrained farm households who often need immediate cash for purchasing farm inputs, resettling debts, paying school fees or other expenses. Most cotton and tea companies usually delay payments under contractual arrangements but offered cash payments in a few circumstances through third party intermediaries.

On additional benefits under contractual arrangements, the positive coefficients of the attribute levels suggest that farmers preferred contracts that cushioned them against farm-level risks. Farmers generally preferred contracts that offered funeral insurance. Cotton farmers preferred funeral cover for farmer and spouse but not for other family members. Interestingly, tea farmers preferred both funeral cover options.

The coefficient on the weather index crop insurance attribute was positive, implying that farmers had a positive attitude towards contracts that included crop insurance. This attribute was strongly preferred by cotton farmers in Chikwawa district, which experiences frequent and prolonged dry spells. The district also records poor cotton yields from rain-fed production, which helps explain the positive preference for contracts with crop insurance cover.

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<sup>3</sup> Beyond this, farmers and farmer association officials also mentioned important challenges of farm gate collection of products as follows. First, collection of the products delayed due to logistical challenges by the company appointed collectors which led to quality losses for tea farmers. The delays also facilitated side-selling to vendors. Second, the collection costs were often higher than would-be cost of transporting the products to the alternative points of delivery. Third, farmers distrusted weighing and grading systems of the field agents at farm gate and believed there was greater transparency at the alternative collection points. Companies also have well distributed collection points in the study area.

**Table 5. Farmers' preferences for contracts**

Variables	Cotton farmers		Tea farmers	
	Mean	SE	Mean	SE
<b>Parameters</b>				
Asc	-3.049***	(0.20)	-2.03***	(0.53)
Price	1.37***	(0.39)	0.20***	(0.03)
Buyer's premises <sup>a</sup>	68.98***	(59.98)	50.88**	(47.02)
Buyer's collection point <sup>a</sup>	130.6***	(47.30)	54.19***	(46.21)
Grade A quality <sup>b</sup>	107.5***	(14.63)	49.15**	(37.89)
Payment within 2 weeks <sup>c</sup>	-22.92**	(14.09)	-7.06***	(1.20)
Payment after 2 weeks <sup>c</sup>	-99.15***	(42.31)	-49.91***	(10.37)
Farmer + spouse insurance <sup>d</sup>	61.47***	(57.25)	10.66**	(7.18)
Family funeral insurance <sup>d</sup>	-16.82*	(15.66)	9.84**	(8.56)
Crop insurance <sup>d</sup>	29.25**	(22.16)	47.62	(50.46)
Farm inputs <sup>d</sup>	109.6***	(48.41)	58.29***	(41.89)
N (number of farmers)	505		512	
N (Number of observations)	9,090	9,090	9,216	9,216
Pseudo R2	0.24		0.28	
Wald $\chi^2$	206.22***		215.30***	

Source: IFPRI farmer choice experiments (2019).

Note: SE = Standard errors in (parentheses); asc = alternative specific constant (the no-contract option); <sup>a</sup> reference is farm gate; <sup>b</sup> reference is grade B; <sup>c</sup> reference is spot payment; <sup>d</sup> reference is no benefit or support. \*, \*\*, and \*\*\* means are significant at the 10%, 5%, and 1% levels, respectively.

Finally, the coefficient on the attribute for supply of farm inputs is positive and significant and with a much higher magnitude compared to the other attributes. This underscores the importance of farm input support to farmers. Both cotton and tea farmers had a positive attitude towards contracts that included farm inputs provision on credit. Currently, contracting companies provide contracted cotton farmers with seeds, fertilizers, pesticides and advance payments recorded in books (passbooks), whose cost buyers then deduct from sales. This is important for liquidity constrained farm households who often lack cash to purchase the right quantity of inputs at the right time. Further, agricultural input markets are poorly integrated with high spatial variation of input prices and inadequate information. This causes high input sourcing costs and consequently farmers prefer to have contracts where buyers supply inputs on credit. Nonetheless, many farmers highlighted that inputs were provided at higher than the market prices under the current contractual arrangements thus reducing their profits (and in some instances leading to losses after buyers deducted input costs at the time of sale).

### 4.3. Farmers' preferences for design attributes

The author calculated farmers' WTA contracts and the changes in design attributes based on the mixed logit estimates in Table 4. The point estimates are derived from farmer-specific coefficients. The values are expressed in MWK per kg and refer to the hypothetical average price premium a farmer requires to accept a contract attribute. The prevailing market price was MWK300/kg for cotton and MWK120/kg for tea. Table 6 presents WTA estimates for cotton and tea farmers.<sup>4</sup>

The results show that cotton and tea farmers require a premium of about MWK51/kg and MWK26/kg respectively to accept contracts with delivery at a buyer's collection point. The premia increase when farmers deliver to buyer premises, which are often distant from the farm gate. As mentioned earlier, farmers generally distrust company agents who come to collect cotton bolls and tea leaf at the farm gate. The premia are high because of the high transportation costs involved in transporting products beyond farm gate. For quality, cotton and tea farmers require a premium of MWK79/kg and MWK25/kg respectively to contract for grade A products. This is high but understandable because quality grades are determined by buyers and not standardized. For payments, cotton and tea farmers require a premium of 6 percent (17/300) and 20 percent (25/120) respectively to accept contracts with delayed payments by up to two weeks. The premium increases when payment is delayed by more than two weeks.

**Table 6. Willingness to accept contract attribute levels**

Variable	Cotton farmers		Tea farmers	
	Mean	Std. Dev.	Mean	Std. Dev.
Buyer's collection point	50.55	33.30	25.59	22.45
Buyer's premises	95.71	28.97	27.26	19.88
Grade A quality	78.76	59.72	24.72	4.20
Payment within 2 weeks	16.79	8.56	25.11	5.20
Payment after 2 weeks	72.66	57.62	35.51	5.51
Farmer + spouse insurance	45.05	9.90	53.60	4.58
Family funeral insurance	-12.32	1.36	49.50	6.11
Crop insurance	21.43	6.99	23.95	4.77
Farm inputs	80.36	17.37	29.32	12.86
Number of observations	505		512	

Source: IFPRI Farmer choice experiments (2019).

For farmer support options under contract scenarios, cotton and tea farmers require a premium of MWK45 and MWK54 respectively to accept contracts with group funeral expenses insurance for the farmer and spouse. This is plausible given that farmers incur costs, albeit lower than if they were to insure themselves individually.<sup>5</sup> Curiously, for cotton farmers, they would require a MWK12 lower premium to accept contracts that offer group funeral insurance covers for at least four family members.

<sup>4</sup> It should be noted that stated preferences data often suffer from hypothetical bias (Hensher et al. 2005). This is also seen in our WTA estimates when one factors in the premium farmers require above the prevailing market prices to accept the attributes.

<sup>5</sup> Although the MOST project provided cotton farmers with free insurance, the study expressly informed farmers that the insurance packages would be offered in groups at a fee to mirror real world scenarios.

Possible lower costs for family insurance than the alternative insurance option can explain this. Cotton farmers require a premium of 7 percent and tea farmers 19 percent to accept contracts that provide crop insurance. For farm inputs, cotton farmers require a premium of about 27 percent while tea farmers require a premium of 24 percent to accept input providing contracts.

In summary, the study finds that farmers generally had a positive attitude towards contracts and preferred contracts that offered higher prices preferably with immediate payments. Contracts providing inputs, crop or funeral insurance were preferred to cushion against farm-level risks. Farm inputs provision seemed to be very important to farmers given the inputs market imperfections in Malawi that continue to impede timely access to farm inputs especially seeds, fertilizers and crop chemicals.

#### **4.4. Companies' preferences for contracts**

As earlier mentioned in the methodology, each of the outgrower managers from the 6 cotton and 5 tea companies was presented with 6 choice cards with 3 options each. Managers were expected to choose one option from each card. A total of 6 stated choices were obtained from each manager. In addition, outgrower managers were asked to provide reasons for their choices in order to understand the weight given to various contract attributes. Table 7 presents a summary of attributes of the choice options preferred. A complete summary of the results is included in the appendix as Table A1 and A2.

Table 7 shows that most companies opted for contract options except for a few cases with tea farmers where attribute combinations were not attractive so that the non-contract option was preferred. Some cotton companies were reluctant to contract smallholders because they experienced wide-spread side-selling, defaults on loan repayment, input diversion and poor yields from frequent and prolonged dry spells. Both cotton and tea companies were willing to offer contracts at or above the market price to ward-off competition and prevent side-selling. They were also willing to buy grade B quality products at market prices but with reduced benefits to minimize side-selling.

In terms of delivery points, most cotton companies chose options with deliveries elsewhere than farm-gate while tea companies preferred farm gate collection. When contracts stipulated payment of market prices for lower grades, companies prioritized cost minimization and chose options that reduced transportation and transaction costs by opting for deliveries at the factors or collection points. Companies with weak contract management systems, especially supervision during harvest periods, opted for contracts with farm gate collection to guarantee supplies in the face of reduced yields, increased competition among buyers and side-selling by farmers. However, for some cotton companies, farm gate collection increased losses when company agents could not get cotton from farmers, especially from loan defaulters.

In terms of payment mode, companies preferred delayed payments but would make exceptions for some contract options especially for grade B cotton and tea. Delayed payments also provided time to inspect the quality of supplies at the factory because dishonest farmers stuffed foreign materials into consignments to add weight or mixed different qualities. This was exacerbated by information asymmetry due to lack of a shared information platform for companies to profile farmers based on their contract history and guard against selecting previous defaulters into their schemes. For grades, most companies preferred contracting for grade A cotton and tea, which fetch higher prices. Interestingly, while companies preferred top grade products, they were flexible in their expectations given their experience with smallholders. They perceived that smallholders had challenges in supplying top quality products because of poor post-harvest handling practices and resource constraints. This was mainly driven by

the widespread lack of standardized grading mechanisms among competitors and side-selling by farmers.

**Table 7. Frequency of attributes in choice options**

Attributes	Cotton (n=36)		Tea (n=30)	
	Frequency	Percentage	Frequency	Percentage
No contract option	0	0.00	7	23.33
Price (>market price)	30	83.33	16	53.33
Farm gate	11	30.56	15	50.00
Collection point	11	30.56	10	33.33
Factory	14	38.89	5	16.67
Grade A	27	75.00	15	50.00
Grade B	9	25.00	15	50.00
Spot payment	12	33.33	12	40.00
Payment within 2 weeks	12	33.33	11	36.67
Payment after 2 weeks	12	33.33	7	23.33
No benefit	9	25.00	11	36.67
Farmer + spouse insurance	6	16.67	8	26.67
Family funeral insurance	7	19.44	3	10.00
Crop insurance	6	16.67	5	16.67
Farm inputs	8	22.22	3	10.00

**Source:** IFPRI company choice experiments (2019).

**Note:** n = total number of choice cards.

In a competitive marketing environment for cotton and tea, companies were open to incentivize farmers to improve quality, yields, and build business relationships while balancing risks between farmers and themselves. Companies were willing to offer contracts that supported farmers with crop insurance, funeral expenses insurance or providing farm inputs on credit. Companies prioritized farm inputs provision to boost production and yields. However, companies were more willing to do this on condition that farmers produced better quality. Farm inputs were also critical to farmers in the choice experiments given that most smallholders are liquidity constrained and lack cash for timely inputs purchases.

#### 4.5. Similarities and differences in preferences for contracts

Our findings show several points of convergence between farmers' and companies' preferences for contracts and design attributes. In general, both farmers and companies prefer contract arrangements to open marketing. In terms of pricing, farmers preferred higher prices and most companies were also willing to offer higher prices to ward off competition. Farm gate collection especially for tea improves quality, since companies have better transportation and handling capacities than farmers. Both farmers

and companies also preferred to sell and buy quality products that fetched higher prices. For this reason, companies were open to providing farm inputs on credit to assist farmers in timely input acquisition to boost the volume and quality of their production. Farmers also liked contracts with funeral or insurance cover and companies were flexible to incorporate such benefits into their contracts.

An important point of divergence between farmers and companies was on delayed payments. Farmers generally preferred spot payments whereas companies clearly preferred delayed payments. On delivery point, most farmers preferred to deliver either to buyers' collection points or buyers' premises (factory) whereas companies preferred to buy at the farm gate to mitigate side-selling by farmers (and weak supervision by field officers).

## 5. CONCLUSION

CF continues to thrive in many developing countries and presents an opportunity to link smallholder farmers to markets. Many studies have examined farmers' preferences for contracts but buyers' (companies') preferences for contracts remain largely unexplored. So, similarities and differences between preferences of buyers and farmers are unknown, despite their importance in designing sustainable contracts that balance risks between farmers and buyers. This study contributes to this knowledge gap by examining farmers' and companies' preferences for contracts and design attributes in the cotton and tea industries in southern Malawi.

The study conducted a discrete choice experiment with 505 cotton farmers and 512 tea farmers in the districts of Chikwawa and Mulanje, respectively. Mixed logit models were used to analyze the choice data. Results show that both farmers and companies prefer to sell and buy using contracts. Despite this, there is a mismatch in preferences for payment mode where farmers prefer spot payments while companies prefer delayed payments. Both farmers and companies prefer selling and buying better quality products that fetch higher prices. However, companies are skeptical of farmers' abilities to guarantee quality while farmers are distrustful of companies' grading systems. Farmers clearly prefer contracts that provide inputs or insurance, and companies are also willing to offer such contracts to improve their relationship with farmers with conditions that guard against farmers' side-selling and adulteration of their product with stones and other foreign matter. Like CF schemes in other developing countries, there is no shared repository of farmer profiles to guide selection of farmers into contract schemes. This information asymmetry limits development and optimization of contract designs that balance marketing risks between farmers and companies. Interestingly, farmers also prioritize non-product related contract attributes such as funeral insurance cover.

The findings have policy implications for price and income stabilization in the small farm sector through contracts, and private sector investment in the agriculture sector (i.e., in insurance and financial services). Beyond providing crop insurance, insurance companies could develop other insurance packages such as funeral expenses insurance that address social needs of farmers while financial institutions could develop financial services to farmers through the contract farming schemes. The future of contracts with smallholders depends on how balanced the contracts are in terms of risk exposure for both parties, developing trust between farmers and buyers, addressing farmers' liquidity constraints, and improving better access to information on farmers on contracting procedures.

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## ABOUT THE AUTHOR

**Dennis Ochieng** is an Associate Research Fellow at IFPRI Malawi and leads the Strengthening Agricultural Markets and Institutions theme within the Malawi Strategy Support Program (MaSSP).

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## REFERENCES

- Abebe, G. K., J. Bijman, R. Kemp, O. Omta, and A. Tsegaye. 2013. "Contract Farming Configuration: Smallholders' Preferences for Contract Design Attributes." *Food Policy* 40: 14–24. <https://doi.org/10.1016/j.foodpol.2013.01.002>
- Bellemare, M. F., and J. R. Bloem. 2018. "Does Contract Farming Improve Welfare? A Review." *World Development* 112: 259–271. <https://doi.org/10.1016/j.worlddev.2018.08.018>
- Benfica, R., and J. Thurlow. 2017. "Identifying Priority Value Chains for Malawi." Presentation to the Ministry of Agriculture, Irrigation and Water Development—To Guide Development of the National Agriculture Investment Plan (NAIP). Lilongwe, Malawi, February 8.
- Bijman, J. 2008. Contract Farming in Developing Countries: An Overview. *Wageningen University, Department of Business Administration*.
- Brown, C., S. Waldron, and J. Longworth. 2011. "Specialty Products, Rural Livelihoods and Agricultural Marketing Reforms in China." *China Agricultural Economic Review* 3 (2): 224–244. <https://doi.org/10.1108/17561371111131335>
- Carrer, M. J., H. Meirelles de Souza Filho, and M. de Melo Brandão Vinholis. 2014. "Plural Forms of Governance in the Beef Industry: A Case Study in Brazil." *British Food Journal* 116 (4): 643–661. <https://doi.org/10.1108/BFJ-04-2012-0089>
- CCM (Cotton Council of Malawi). 2019. *Special Campaign for Cotton Production Enhancement*. Lilongwe: MoAIWD.
- du Toit, J., F. J. Nankhuni, and J. S. Kanyamuka. 2018. *Opportunities to Enhance the Competitiveness of Malawi's Tea Industry: Evidence from an Analysis of the Tea Value Chain*. Feed the Future Innovation Lab for Food Security Policy Research Brief 79. Department of Agricultural, Food, and Resource Economics, Michigan State University, East Lansing. [10.22004/ag.econ.279874](https://doi.org/10.22004/ag.econ.279874)
- FAO (Food and Agriculture Organization of the United Nation). 2014. Analysis of Price Incentives for Tea in Malawi. Technical Notes Series, MAFAP, by Cameron A., and F. Mkomba. Rome.
- Feltre, C., and L. Paulillo. 2015. "Plurality in Different Groupings: Sugarcane Supply in Brazil." *British Food Journal* 117 (9): 2265–2281. <https://doi.org/10.1108/BFJ-03-2015-0091>
- FEWSNET (Famine Early Warning Systems Network), 2018. Malawi Food Security Outlook Update. [Online].
- Hazell, P. B. R., and U. Hess. 2010. "Drought Insurance for Agricultural Development and Food Security in Dryland Areas." *Food Security* 2 (4): 395–405. <https://doi.org/10.1007/s12571-010-0087-y>
- Hensher, D. A., J. M. Rose, and W. H. Greene. 2005. "Applied Choice Analysis: A Primer." Cambridge: Cambridge University Press.
- Hochrainer, S., R. Mechler, and G. Pflug. 2009. "Climate Change and Financial Adaptation in Africa. Investigating the Impact of Climate Change on the Robustness of Index-based Microinsurance in Malawi." *Mitigation and Adaptation Strategies for Global Change* 14 (3): 231–250. <https://doi.org/10.1007/s11027-008-9162-5>
- Holloway, G., C. Nicholson, C. Delgado, S. Staal, and S. Ehui. 2000. "Agroindustrialization through Institutional Innovation Transaction Costs, Cooperatives and Milk-Market Development in the east-African Highlands." *Agricultural Economics* 23 (3): 279–288. <https://doi.org/10.1111/j.1574-0862.2000.tb00279.x>
- Hueth B., and D. A. Hennessy. 2002. "Contracts and Risk in Agriculture: Conceptual and Empirical Foundations." In *A Comprehensive Assessment of the Role of Risk in U.S. Agriculture*. Natural Resource Management and Policy. Vol 23. Edited by R. E. Just, and R. D. Pope. 167–189. Springer, Boston, MA. [https://doi.org/10.1007/978-1-4757-3583-3\\_9](https://doi.org/10.1007/978-1-4757-3583-3_9)
- Jensen, N., and C. Barrett. 2017. "Agricultural Index Insurance for Development." *Applied Economic Perspectives and Policy* 39 (2): 199–219. <https://doi.org/10.1093/aep/pw022>
- Kanchanarook, Y., and U. Aslam. 2018. "Policy Schemes for the Transition to Sustainable Agriculture—Farmer Preferences and Spatial Heterogeneity in Northern Thailand." *Land Use Policy* 78: 227–235. <https://doi.org/10.1016/j.landusepol.2018.05.026>

- Kenamu, E., and A. Phiri, 2014. "Performance of Cotton Production in Malawi." *Scholarly Journal of Agricultural Science* 4 (3): 157–165. <https://doi.org/10.5897/JDAE2016.0800>
- Kumwenda, I., and M. Madola (2005). "The Status of Contract Farming in Malawi". *Food, Agriculture and Natural Resources Network*. From [URL:http://www.fanpan.org/documents/d00691/Contract\\_Farming\\_Report](URL:http://www.fanpan.org/documents/d00691/Contract_Farming_Report.pdf) .pdf Last Accessed: [15/01/20].
- Maertens, M., and K. V. Velde. 2017. "Contract-Farming in Staple Food Chains: The Case of Rice in Benin." *World Development* 95: 73–87. <https://doi.org/10.1016/j.worlddev.2017.02.011>
- Magombo, E., A. Edriss, and M. A. R. Phiri. "Determinants of Malawi's Cotton Exports from 2001 to 2013." *Journal of Development and Agricultural Economics* 9 (4): 80–86. <https://doi.org/10.5897/JDAE2016.0800>
- Meemken, E. M., and M. F. Bellemare. 2020. "Smallholder Farmers and Contract Farming in Developing Countries." In *Proceedings of the National Academy of Sciences* 117 (1): 259–264. <https://doi.org/10.1073/pnas.1909501116>
- Mello, F. O. T., and L. F. O. Paulillo. 2010. Plural Forms of Governance in the Agro-industrial System for Citrus. *Revista de Economia e Sociologia Rural* 48 (1): 135–159. <https://doi.org/10.1590/S0103-20032010000100007>
- Minten, B., L. Randrianarison, and J. F. M. Swinnen. 2009. "Global Retail Chains and Poor Farmers: Evidence from Madagascar." *World Development* 37 (11): 1728–1741. <https://doi.org/10.1016/j.worlddev.2008.08.024>
- Mishra, A. K., A. Kumar, P. K. Joshi, and A. D'Souza. 2018. "Production Risks, Risk Preference and Contract Farming: Impact on Food Security in India." *Applied Economic Perspectives and Policy* 40 (3): 353–378. <https://doi.org/10.1093/aep/ppy017>
- MoAIWD (Malawi Ministry of Agriculture, Irrigation and Water Development). 2018. *Agricultural Production Estimate Survey*. Lilongwe: MoAIWD.
- . 2016. *National Contract Farming Strategy*. Lilongwe: MoAIWD.
- Mugwagwa, I., J. Bijman, and J. Trienekens. 2018. Why do Agribusiness Firms Simultaneously Source from Different Contract Farming Arrangements? Evidence from the Soybean Industry in Malawi. *International Food and Agribusiness Management Review* 22: 79–96. <https://doi.org/10.22434/IFAMR2018.0079>
- Ochieng, D. O., P. C. Veetil, and M. Qaim. 2017. "Farmers' Preferences for Supermarket Contracts in Kenya." *Food Policy* 68: 100–111. <https://doi.org/10.1016/j.foodpol.2017.01.008>
- Otsuka, K., Y. Nakano, and K. Takahashi. 2016. "Contract Farming in Developed and Developing Countries." *Annual Review of Resource Economics* 8: 353–376. <https://doi.org/10.1146/annurev-resource-100815-095459>
- Oya, C. 2012. "Contract Farming in sub-Saharan Africa: A Survey of Approaches, Debates and Issues." *Journal of Agrarian Change* 12 (1): 1–33. <https://doi.org/10.1111/j.1471-0366.2011.00337.x>
- Ragasa, C., I. Lambrecht, and D. S. Kufolour. 2018. "Limitations of Contract Farming as a Pro-poor Strategy: The Case of Maize Outgrower Schemes in Upper West Ghana." *World Development* 102: 30–56. <https://doi.org/10.1016/j.worlddev.2017.09.008>
- Repar, L. A., S. Onakuse, J. Bogue, and A. Afonso. 2018. "Key Challenges in Malawi's Paprika Supply Chain: New Insights into Contract Farming." *Development in Practice* 28 (2): 227–241. <https://doi.org/10.1080/09614524.2018.1424801>
- . 2017. "Optimising Contract Design in Modern Food Supply Chains: The Case of Paprika sector in Central Malawi." *Journal of Agriculture and Rural Development in the Tropics and Subtropics* 118 (1): 113–127.
- Ruml, A., C. Ragasa, and M. Qaim. 2020. *Heterogeneous Effects of Marketing Contracts and Resource-providing Contracts on Household Income*. GlobalFood Discussion Paper 138. University of Goettingen. <http://www.uni-goettingen.de/de/213486.html>
- Saenger, C., M. Qaim, M. Torero, and A. Viceisza. 2013. "Contract Farming and Smallholder Incentives to Produce High Quality: Experimental Evidence from the Vietnamese Dairy Sector." *Agricultural Economics* 44 (3): 297–308. <https://doi.org/10.1111/agec.12012>
- Saenger, C., M. Torero, and M. Qaim. 2014. "Impact of Third-party Contract Enforcement in Agricultural Markets—A Field Experiment in Vietnam." *American Journal of Agricultural Economics* 96 (4): 1220–1238. <https://doi.org/10.1093/ajae/aau021>
- Suarez, P., and J. Linnerooth-Bayer. 2010. "Micro-insurance for Local Adaptation." *Wiley Interdisciplinary Reviews: Climate Change* 1 (2): 271–278. <https://doi.org/10.1002/wcc.37>
- Syroka, J., and A. Nucifora. 2010. "National Drought Insurance for Malawi." Policy Research Working Paper 5169. Washington, DC: World Bank.
- Vinholis, M. M. B., H. M. de Souza Filho, M. J. Carrer, and F. R. Chaddad. 2014. "Transaction Attributes and Adoption of Hybrid Governance in the Brazilian Cattle Market." *Journal on Chain and Network Science* 14 (3): 189–199. <https://doi.org/10.3920/JCNS2014.0239>
- Wang, H. H., Y. Wang, and M. S. Delgado. 2014. "The Transition to Modern Agriculture: Contract Farming in Developing Economies." *American Journal of Agricultural Economics* 96 (5): 1257–1271. <https://doi.org/10.1093/ajae/aau036>
- Winters, P., P. Simmons, and I. Patrick. 2005. "Evaluation of a Hybrid Seed contract between Smallholders and a Multinational Company in East Java, Indonesia." *Journal of Development Studies* 41 (1): 62–89. <https://doi.org/10.1080/0022038042000276572>
- World Bank. 2019. *Malawi Economic Monitor. Charting a New Course*. Lilongwe, Malawi.

# APPENDIX

**Table A 1. Cotton companies' preferences for contracts**

Company	Block	Card	Option	Price	Delivery	Quality	Payment	Benefit
1	1	1	2	345	Nearest	A	Spot	None
		2	2	345	Nearest	A	2 weeks	Inputs provision
		3	2	300	Factory	B	>2weeks	Crop insurance
		4	2	375	Farm gate	A	>2weeks	Inputs provision
		5	2	345	Nearest	B	>2weeks	Family insurance
		6	1	300	Factory	A	Spot	Family insurance
2	2	7	1	315	Nearest	A	2 weeks	Inputs provision
		8	1	330	Nearest	A	>2weeks	Crop insurance
		9	1	315	Farm gate	A	Spot	None
		10	2	315	Factory	A	>2weeks	Farmer + spouse insurance
		11	1	315	Nearest	A	2 weeks	Crop Insurance
		12	1	375	Nearest	A	>2weeks	Farmer + spouse insurance
3	3	13	2	345	Factory	A	2 weeks	Crop insurance
		14	2	375	Farm gate	A	2 weeks	None
		15	2	375	Nearest	B	Spot	Farmer + spouse insurance
		16	1	360	Farm gate	A	2 weeks	Inputs provision
		17	1	315	Farm gate	B	>2weeks	None
		18	2	300	Factory	A	2 weeks	Inputs provision
4	4	19	2	330	Factory	A	2 weeks	Inputs provision
		20	2	375	Nearest	A	>2weeks	Family insurance
		21	2	330	Farm gate	A	2 weeks	Family insurance
		22	1	360	Factory	B	>2weeks	Family insurance
		23	2	360	Factory	B	Spot	None
		24	1	360	Factory	A	Spot	Farmer + spouse insurance
5	5	25	1	330	Farm gate	A	Spot	Farmer + spouse insurance
		26	2	375	Factory	A	Spot	Inputs provision
		27	1	360	Factory	A	>2weeks	None
		28	1	345	Farmgate	A	2 weeks	Farmer + spouse insurance
		29	2	330	Factory	A	>2weeks	None
		30	2	360	Nearest	A	Spot	Crop insurance

6	1	1	1	300	Farm gate	B	Spot	None
		2	2	345	Nearest	A	2 weeks	Inputs provision
		3	1	300	Factory	B	>2weeks	Inputs provision
		4	1	300	Farm gate	A	Spot	Crop insurance
		5	1	300	Farm gate	B	2 weeks	None
		6	2	330	Factory	A	Spot	Family insurance

**Source:** IFPRI company choice experiment (2019).

**Note:** Family insurance = funeral insurance cover for up to 4 family members; > = more than; Crop insurance = weather index insurance cover; Inputs = seeds, crop chemicals, credit, extension; Factory = delivery at factory premises; Nearest = delivery at the nearest collection point.

**Table A 2. Tea companies' preferences for contracts**

Company	Block	Card	Option	Price	Delivery	Quality	Payment	Benefit
1	1	1	2	135	Nearest	A	Spot	None
		2	2	135	Nearest	A	2 weeks	Inputs provision
		3	1	120	Nearest	B	Spot	Inputs provision
		4	2	120	Farm gate	A	>2weeks	Crop insurance
		5	1	120	Farm gate	B	>2weeks	Family insurance
		6	3	120	Farm gate	B	Spot	None
2	2	7	2	125	Farm gate	A	Spot	Family insurance
		8	2	120	Nearest	A	>2weeks	Farmer + spouse insurance
		9	3	120	Farm gate	B	Spot	None
		10	2	125	Factory	A	>2weeks	Farmer + spouse insurance
		11	1	125	Nearest	A	2 weeks	Crop insurance
		12	1	145	Nearest	A	>2weeks	Farmer + spouse insurance
3	3	13	2	135	Factory	A	2 weeks	Crop insurance
		14	3	120	Nearest	B	Spot	None
		15	1	125	Farm gate	B	2 weeks	Crop insurance
		16	2	130	Factory	A	2 weeks	Crop insurance
		17	1	125	Farm gate	B	>2weeks	None
		18	2	120	Factory	A	2 weeks	Inputs provision
4	4	19	1	120	Farm gate	B	Spot	None
		20	1	120	Nearest	A	>2weeks	None
		21	3	120	Farm gate	B	Spot	None
		22	3	120	Farm gate	B	Spot	None
		23	3	120	Farm gate	B	Spot	None
		24	3	120	Farm gate	B	Spot	None
5	5	25	1	130	Farm gate	A	Spot	Farmer + spouse insurance
		26	1	140	Farm gate	A	2 weeks	Farmer + spouse insurance
		27	2	125	Factory	B	3 weeks	Farmer + spouse insurance
		28	1	135	Farm gate	A	2 weeks	Farmer + spouse insurance
		29	1	130	Nearest	B	2 weeks	Family insurance
		30	1	135	Nearest	B	2 weeks	Farmer + spouse insurance

**Source:** IFPRI company choice experiment (2019).

**Note:** Family insurance = funeral insurance cover for up to 4 family members; > = more than; Crop insurance = weather index insurance cover; Inputs = seeds, crop chemicals, credit, extension; Factory = delivery at factory premises; Nearest = delivery at the nearest collection point.

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IFPRI Malawi, Area 14 Office, Plot 14/205, Lilongwe, Malawi | Mailing Address: PO Box 31666, Lilongwe 3, Malawi

T +265-1-771-780 | Email: [IFPRI-Lilongwe@cgiar.org](mailto:IFPRI-Lilongwe@cgiar.org) | <http://massp.ifpri.info>

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