Financialization, market reform, global commodity chains, and commodity prices: Distributional implications on cotton sectors in Sub-Saharan Africa

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ABSTRACT

Restructuring of global and local markets has led to an increased influence of commodity derivatives markets on commodity price setting. This has critical implications for price risks experienced by actors along commodity chains. Commodity derivatives markets have undergone significant changes that have been referred to as the "financialization of commodities" which we define as an increase in trading activity motivated by financial interests alone, and the reorientation of business strategies by commodity trading houses towards risk management and financial activities. This paper assesses how these global financialization processes affect commodity producers in low income countries via the operational dynamics of global commodity chains and distinct national market structures. It investigates how prices are set and transmitted and how risks are distributed and managed in the cotton sectors in Burkina Faso, Mozambique and Tanzania. It concludes that uneven exposure to price instability and access to price risk management have important distributional implications. Whilst international traders have the capacity to deal with price risks through hedging in addition to expanding their profit possibilities through financial activities on derivative markets, local actors in producing countries face the challenge of increased short-termism – albeit to different extents depending on national market structures - with limited access to risk management.

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KEYWORDS

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INTRODUCTION

The unprecedented commodity price rise and heightened volatility since 2003 has reignited academic and political discussions on the drivers of commodity prices and their consequences for commodity dependent developing countries. Commodity producers have not only been affected by changing price dynamics but also by broader changes in the functioning of commodity markets that have taken place. These changes can be understood as part of the process of financialization. Both the financialization of households and firms, driven by a process of withdrawal of the state from provisions for health, social security and old age, and the falling rate of profit in the real economy respectively, have promoted financial investment in general and the rise of commodities as an asset class in portfolio investment in particular (Domanski and Heath 2007).

This paper seeks to investigate how processes of financialization, defined as the rise of purely financial interests and the changing corporate strategies of commodity trading houses towards risk management and financial activities on commodity derivative markets, affect commodity producers via the operational dynamics of global commodity chains and distinct national market structures in producing countries. While there is now a large, often quantitative, literature on the implications of financialization on commodity prices, there is limited analysis of how financialization dynamics manifest along particular commodity chains. This is related to a division within the literature between the study of financial markets and the financial dimension of price transmission at the international level and global commodity chain, value chain and production network analyses on the impact on producers and other chain actors (Bargawi and Newman 2016; Clapp and Helleiner 2012). The former remains focused upon global level analyses of futures and spot prices and financial sector operations while paying no attention to what this means for local markets and producers under a system of globalized production (e.g. Gilbert 2010; UNCTAD 2011; Basak and Pavlova 2011; Tang and Xiong 2012). The latter has focused on analysing the organisation and governance of international production, particularly through the role of lead firms, and how this affects the development prospects of producers (e.g. Gereffi 1995; Gereffi et al. 2001; Kaplinsky and

Morris 2001; Henderson et al. 2002; Gibbon and Ponte 2005). With a few notable exceptions (e.g. Newman 2009; Clapp 2014; Bargawi and Newman 2016), research to date has largely neglected the role of finance and financial markets in shaping the structure and functioning of commodity chains and the outcomes for different actors in commodity sectors. In light of this analytical gap, scholars working in the global production network tradition, in particular, have begun to incorporate issues of financialization into their frameworks (Coe et al. 2014; Yeung and Coe 2015). This paper contributes to this burgeoning debate and focuses on the cotton sector in sub-Saharan Africa (SSA).

The paper assesses the question of how global financialization dynamics on commodity derivative markets interact with commodity chains and national market structures in affecting the ways in which prices are "set" and transmitted, and how risks are distributed and managed along cotton chains. The paper argues that the distribution of price risks, resulting from price setting and price risk management (PRM) strategies adopted by different chain actors and the mediating impact of national market institutions, have profound distributional implications along commodity chains. As participants on both physical and derivative markets for cotton, international trading houses play a critical role in bridging the impact of financialization on international commodity exchanges on price dynamics experienced on the ground. Their business strategies inform their choice of price benchmarks, PRM strategies, and the types of contracts that they strike with exporters and producers. In turn, international commodity trading houses operate within distinct institutional contexts of cotton producing countries. This paper analyses how differences between cotton marketing systems in three SSA countries have influenced the ways in which prices, price risks, and PRM strategies manifest and, in turn, what this implies for distributional outcomes along cotton commodity chains. Since the 1990s, Burkina Faso, Mozambique and Tanzania have pursued different reform agendas. These differences have conditioned the ways in which global financialization dynamics and international traders' strategies and practices have played out in each national system.

A commodity chain approach is adopted since it allows us to analyse interactions between changes taking place on international derivative markets and the organization and functioning of physical markets, first, by tracking the impact of global dynamics, such as financialization on commodity derivative markets, along the chain towards actors in producing countries and, second, by highlighting the important role that lead firms and governance structures play on

distributional outcomes along the chain.

The focus on cotton was motivated by the important role that it plays in economies of SSA as a major source of foreign exchange earnings and contributor to GDP. Along with coffee, cotton is the most important export cash crop, and accounted for 10.5 per cent of total SSA agricultural exports in 2013. More importantly, cotton production generates income for millions of small holder farmers and rural households. There are, however, fundamental differences in the relative economic importance of cotton across producing countries. The economic importance of cotton in West and Central Africa (WCA) far exceeds that in East and Southern Africa (ESA) (Gibbon 2001). This is also reflected in differences in the levels of state intervention in the three countries studied in this paper where cotton accounts for 17.7, 2.5 and 2.3 per cent of exports in Burkina Faso, Mozambique and Tanzania respectively in 2013. The cotton sector is critical to the livelihoods of around 350,000 farmers in Burkina Faso, 250,000 in Mozambique and 425,000 in Tanzania.

The analysis is based on trade, industry and financial data, interviews with international commodity traders and actors on commodity exchanges (June 2007 and December 2012), and fieldwork in Burkina Faso (September 2014), Mozambique (November 2014) and Tanzania (July 2007, August 2014 and September 2015). Of the eight largest private international cotton traders that traded more than 200,000 tons per year in 2014, four were interviewed. This was complemented by interviews with ten financial investors trading in cotton, two brokers dealing in cotton, two representatives of relevant commodity exchanges, and three representatives of international cotton associations. In cotton producing countries, semi-structured interviews were conducted with three, four and thirteen ginners in Burkina Faso, Mozambique and Tanzania respectively, the three ginners' associations and farmers' organizations, representatives of the government bodies responsible for the cotton sector – the Secrétariat Permanent de Suivi de la Filière Coton Libéralisé (SP/SFCL) in Burkina Faso, the Instituto do Algodão de Moçambique (IAM) and the Tanzanian Cotton Board (TCB) – as well as sector experts.

FINANCIALIZATION OF COMMODITY MARKETS AND GLOBAL COMMODITY CHAINS

Various concepts of financialization have gained prominence in scholarship over the last decade to describe and explain the specificities of contemporary capitalism. In its broadest sense, financialization describes the increasing role and dominance of financial motives, activities and profits in the economy and society more widely (Epstein 2005). Related fields of economics, political economy, economic geography, critical business studies and sociology have seen the proliferation of different concepts to such an extent as to call to question the analytical purchase of the term (Christophers 2015). While it is beyond the scope of this article to assess the merits, limitations and theoretical novelty of the concept, the authors recognize the contested nature of the term and proceed by providing two 'functional' definitions of the "financialization of commodities" as describing concrete phenomena and trends in commodity markets: first, the increase in activities on commodity derivatives markets driven purely by financial interests through the large-scale entry of financial investors; and second, changes in the business strategies of international commodity traders as they increasingly place commodity derivatives markets at the centre of their trading activities and profit generation strategies.

Literature on the "financialization of commodities" refers, in the main, to our first functional definition and links increased financial interests on commodity markets with the recognition of commodities as an asset class under "money manager capitalism" (Wray 2008). Commodity derivative markets were initially developed for the primary purpose of price risk management. Whilst speculators have always played a role in these markets in taking opposite positions to physical hedgers they have played an increasingly prominent role in recent decades and transitioned from specialized trading in a few commodities to a wide range of commodities informed by the conception of commodities as an asset class in a similar way to stocks, bonds and real estate assets, within portfolio investment strategies (Nissanke 2011; UNCTAD 2011). The 1990s saw an increase in hedge funds active on commodity exchanges as entry barriers were lowered by deregulation and the transition from open outcry to electronic trading platforms. More recently large institutional investors, pension funds in particular, have entered commodity derivatives markets via index funds. Investment banks now offer diverse products for commodity derivative market investments to allow their clients to profit from commodity price developments, in addition to trading on their own account. The dot-com crisis of 2001/02 and the global financial crisis of 2007/8 saw increased interest in commodities as investors searched for new opportunities for portfolio diversification. In sum, there has been a sharp rise in trading volumes together with

an increase in the variety of investment products and associated trading strategies with implications for commodity price dynamics (Mayer 2012; Heumesser and Staritz 2013).

To date, the bulk of empirical research on the financialization of commodities has focused upon the impact of financial actors and activities on price dynamics at the level of the exchanges themselves. While disagreement remains, there is increasing evidence that the financialization of commodity markets has had an impact on prices in addition to fundamental demand and supply factors (for an overview, see UNCTAD 2011; Ederer et al. 2016). Tang and Xiong (2012) were amongst the first to report greater co-movement across futures prices since 2004 for commodities that formed part of commodity index instruments. Bases on a model of commodity markets with heterogeneous agents, Basak and Pavlova (2016) estimated that futures prices increased by between 11 and 17 per cent due to finanzialisation. In the same vein, Ederer et al. (2016) estimated that between 10 and 50 per cent of the variation in prices of coffee, cotton, wheat and oil can be explained by net long positions of money managers. The increased presence of financial actors on international commodity exchanges has also been linked to heightened commodity price volatility (e.g. UNCTAD 2011; Cheng and Xiong 2014). The functioning of commodity derivative markets has also changed in relation to these price impacts with the introduction of more complex and short-term investment products that seek to profit from short-term price movements (Heumesser and Staritz 2013).

Whilst it is increasingly evident that financial activities on international commodity exchanges have had an impact on commodity futures prices, the extent and ways in which prices evolving on international exchanges are experienced by actors in commodity producing countries remains relatively unexplored. There is a debate on the relation between futures and spot prices and recent findings show that futures prices have an impact on spot prices (e.g. Hernandez and Torero 2010; Chinn and Coibion 2014). But the focus of the "financialization of commodities" literature has remained upon statistical analysis of prices on exchanges themselves often with the perception of commodity derivatives as investment vehicles disconnected from physical markets and real-world processes of commodities production and trading (exceptions include Newman 2009; Bargawi and Newman 2016). Questions of how changes on international derivative exchanges interact with the organisation and functioning of physical markets, global commodity chains and price setting institutions in producing countries, and the related development prospects of producers,

firms, regions and countries as they are differentially integrated along these chains have yet to be broached.

To assess these questions it is important to introduce our second functional definition of financialization that has been widely used in the "financialization of non-financial corporations" literature in critical business studies and heterodox macroeconomics inspired by the seminal work of Lazonick and O'Sullivan (2000).[1] Financial activities on commodity derivative markets have increased not only through the entry of financial investors but also through a reorientation in the business models of physical traders that are increasingly informed by financial motives and activities. International commodity trading houses play a critical role here as they dominate the physical trade of cotton (ICAC 2015a). In addition to replacing alternative PRM strategies, derivatives trading has also become a lucrative site for financialized accumulation (Newman 2009; Heumesser and Staritz 2013; Gibbon 2014). This is reflected in the restructuring of commodity trading companies to place "risk management" at the centre of their core competencies. While there is considerable variation among international traders, the increased role of large multi-commodity trading companies (for cotton see ICAC 2009, 2015) has led to financial trading strategies becoming more dominant. Several large international traders have their own financial services units or hedge funds, investing on their own account, managing third party money, and selling investment products. While the proportion of company revenues coming from such financial activities has remained relatively small and variable, they have grown with respect to revenues derived directly from the trading of physical commodities (Gibbon 2014).[2] Commodity trading houses thus play the dual role of physical commodity trader and financial investor on commodity markets (Newman 2009).

As financial investors, commodity trading houses have contributed to changes in price dynamics on commodity derivatives exchanges in the ways discussed above. In addition, the business strategies of commodity traders as lead firms in commodity chains[3] have a direct impact upon the nature of physical trade and price transmission along the chain to exporters

[1] Lazonick and O'Sullivan (2000) elucidated the shift from "old economy" or "productionist" business models to a "new economy" model with firms' veracious pursuit of profit increasingly delinked from investment in production while linked to financial markets.
[2] Gibbon (2014) underlines that although financial activities' contribution to revenues may be small, their potential contribution to profits can be much higher with shares up to 25 per cent between 2004 and 2008.
[3] In commodity sectors there may be multiple lead firms in addition to commodity traders such as supermarkets and extractive companies (Gibbon and Ponte 2005).

and producers. The increased activities of commodity trading houses on derivatives markets in general, and the use of these markets for hedging in particular, has meant that futures prices have become their preferred price benchmark when negotiating prices for physical trades. This has also been accompanied by the replacement of fixed-price-forward with price-to-be-fixed (PTBF) as the dominant contractual arrangement between commodity trading houses and exporters with the effect of binding together price movements on commodity derivatives markets with those on the ground even more closely.[4] Hence, international traders play a pivotal role in the transmission of prices from international derivatives markets to physical markets through price benchmarks and the types of contracts that they use as they deal with price risks and expand their core activities and profit possibilities.

How financialization dynamics on global commodity derivative markets are played out along commodity chains depend however not only on lead firms strategies but also on the institutional and regulatory context in which commodity chains are embedded. This context has changed significantly in commodity sectors since the 1980s and 1990s. Interventions after the Second World War emphasized the stabilization of prices and export earnings through multilateral agreements such as buffer stocks and export quota in the context of International Commodity Agreements (ICAs) and national price stabilisation arrangements such as national commodity boards in producing countries.[5] The period since the collapse of the ICAs and the domestic liberalization of national commodity sectors has seen liberalization and the promotion of market-based instruments for price setting and risk management supported by the World Bank and other donors (World Bank 2011; Nissanke 2011). For example, the dismantling of national marketing boards and producer price[6] setting has meant that short-term price fluctuations evolving on international exchanges, and hence price risks, are increasingly transmitted to exporters in producing countries that then transmit these in varying ways upstream towards producers. In this way, institutional changes have further bound together export prices[7] with global futures prices. Whilst commodity derivatives markets have been also promoted as insurance for producing country actors,

[4] In fixed-price-forward contracts price risks are mitigated by fixing the price. In this way, short-term price movements at the international level are not transferred to producing countries. In PTBF contracts, the price is only fixed after signing the contract (but before delivery) as the prevailing price on the derivatives market which transfers international price movements to producing countries.

[5] Alongside, the Compensatory Financing Facility of the IMF and the STABEX scheme of the European Community were put in place to ameliorate the adverse effects of commodity export instability (Newman 2009).

[6] The price that producers receive for seed cotton

[7] The price received by exporters for cotton lint

effective access to and use of hedging instruments remain highly uneven along commodity chains with chain actors opting for a variety of PRM strategies that have implications for the transmission of price movements upstream along the chain (Newman 2009; Breger Bush 2012). At the same time, domestic marketing structures continue to play a critical role in the processes of PRM and price setting on the ground.

To sum up, our conceptual framework involves a chain approach that focuses on how financialization dynamics on commodity derivative markets have affected the nature of price formation, transmission and PRM along commodity chains as these processes are mediated by the business strategies of international trading houses and institutional specificities in market structures in producing countries. We trace the process of price formation from futures markets, along the chain from international traders, via exporters and the national marketing system that connects producers with exporters. In doing so, we are able to connect global processes of financialization to national institutional contexts in producing countries and ultimately to outcomes on the distribution of income and risks along commodity chains.

PRICE SETTING AND FINANCIALIZATION IN INTERNATIONAL COTTON MARKETS

The system of price formation in the international cotton market provides the key in linking financialization dynamics, international traders' strategies, and institutional reforms in cotton producing countries. A clear distinction between the "actual price of cotton" and "the world price of cotton" needs to be drawn. While the former refers to the price at which physical cotton transactions take place (e.g. prices received by exporters and producers), the latter is established in a "global price realization" process and can take on multiple forms (Caliskan 2010). Caliskan (2010) refers to this as a process of making prices visible. The world price serves as a reference upon which actual prices appear on the ground but it does not embody the price at which physical transactions take place. For cotton, the Cotlook A-index and the Intercontinental Exchange (ICE) cotton futures price serve as world prices. While the actual prices may vary because of differences in quality, location, delivery schedule and bargaining power, the two world prices are the most important factor in the determination of the "actual price of cotton".

The Cotlook A-index is compiled daily by Cotton Outlook, a private company in Liverpool, on the basis of quotations that they collect from cotton traders.[8] These quotations are not actual prices for recent sales or spot transactions but indicative prices informed by traders' engagement in cotton positions (Caliskan 2010). In contrast, cotton futures prices are established throughout the trading day and reflect the supply and demand for derivatives contracts exchanged on the ICE. Delivery on the ICE is limited to cotton produced and delivered in the U.S. Nevertheless, ICE futures prices are used as a reference in physical contracts outside of the US since ICE cotton futures are the preferred hedging instrument used by cotton trading houses worldwide.[9] Even though there is no formal relationship between the Cotlook A-index and ICE futures prices, the two world prices are increasingly correlated as traders take into account ICE prices for their quotations for Cotton Outlook. The correlation coefficient between the monthly returns of the Cotlook A-index and of the nearby ICE futures contract increased from 85 per cent between 1999 and 2007 to 91 per cent between 2008 and April 2015. Plastina (2009) found that the magnitude of futures prices pass-through on the Cotlook A-index has increased. This is indicative of the fact that prices quoted by international traders have become more responsive to daily changes in futures prices. All international traders interviewed confirmed that while both world prices are important, the ICE futures prices have overtaken the Cotlook A-index in informing price negotiations.

> "New York is the benchmark on which to judge and decide upon prices." (International cotton trader interviewed in 2012)

> "In the US, the futures market basically sets the price and depending on supply and demand, what's called a base, you buy a base into the futures market. In other markets too it's supply and demand in relation to mostly US cotton (…), so that basically determines the price… [I]t's the information collection centre and the price setting centre, the NYBOT[10] futures market, absolutely." (International cotton trader interviewed in 2007)

[8] It represents the average of the five lowest quotations of 19 types of cotton (Middling 1 -3/32'') from the following origins: Australia, Brazil, China, Francophone Africa, Greece, India, Mexico, Pakistan, Paraguay, Spain, Syria, Tanzania, Turkey, the US and Uzbekistan (Baffes 2004).
[9] In November 2015, after years of debate, ICE introduced a World Cotton Futures contract with various international deliverable origins and delivery points. So far, trading volumes on these contracts are however low.
[10] The New York Board of Trade (NYBOT) was acquired by ICE in September 2007.

As for other commodities, financialization dynamics on commodity derivative markets are also observed in the cotton sector. There has been an increase in both the level and volatility of total open interest in cotton futures and options in the ICE since the early 2000s. Between 2006 and 2015, the share of open positions accounted for by financial investors fluctuated around 60 per cent (Figure 1). Ederer et al. (2016) found that 15 per cent of the variation in monthly cotton prices between 2006 and 2012 can be traced back to net long positions of financial investors, particularly money managers in futures markets. The speed, complexity and short-termism of derivatives trading has increased as a result of financial investors' trading strategies and the introduction of electronic trading, extended trading hours and new investment products. Market participants interviewed stated that intra-day price volatility is a rather new phenomenon that had not been previously observed for cotton futures. Trading cotton futures has thus become more challenging as greater flexibility in trading has required greater awareness of market movements. Physical cotton traders interviewed stated that they monitor financial investors' behaviour closely in order not to position themselves "against the market". Physical traders, thus, try to anticipate the factors that determine financial investors' decisions in addition to fundamentals when determining their own position in derivatives.

> "When discussing hedging and trading strategies with our brokers; we talk about the behaviour of large financial investors particularly hedge funds every day. We look at their transactions and positions…" (International cotton trader interviewed in 2012)

> "The banks are trying to understand our markets and we try to understand their markets". (International trader cited in UNCTAD 2011)

Figure 1 here

Physical cotton traders have also changed their business strategies with an increasing focus on financial motives. Whilst smaller, single commodity, traders largely remain focused on physical trading activities, the longer-term trend towards market concentration and greater presence of multi-commodity trading houses – that was furthered during the global economic

crisis due to tightened credit conditions and a fall in cotton demand[11] - has increased the importance of derivative markets linked risk management and financial trading strategies as multi-commodity trading houses place derivatives trading centre stage in their business activities (Pirrong 2014). The number of privately owned cotton trading companies dealing with annual volumes above 200,000 tons has decreased from 11 in 2008 to 8 in 2014. These eight largest private traders accounted for more than 60 per cent of international cotton trade in 2014 (ICAC 2009, 2015a). A number of large cotton traders have also diversified their derivatives trading activities beyond hedging. Fund management, as well as risk management, are now part of the business activities of the top three cotton traders: Louis Dreyfus, Cargill and Olam. Since 2008, Louis Dreyfus' financial operations have been organised in three funds with a directly controlled asset management unit and a hedge fund with $2.4 billion in assets under management (Louis Dreyfus 2015; Gibbon 2014). Cargill has at least five financial subsidiaries which provide risk management and investment products for their own business units and external clients which include producers, physical traders, pension funds, hedge funds and endowment communities. Products include a commodity-related hedge and private equity fund with estimated assets of $5.9 billion in 2013 (Vander Stichele 2012; Cargill 2015; Gibbon 2014). "Commodity Financial Services" was launched by Olam in 2003 as a business segment that was subsequently re-established as a subsidiary, Invenio, in 2010 (Olam 2014). With these operations, new risk management and profit opportunities based upon deepened engagement with derivatives markets have expanded for international cotton traders. In this way, international traders, as lead firms in cotton chains, have bound together futures prices with national export and producer prices on the ground via their trading and price setting practices.

NATIONAL MARKET STRUCTURE AND TRANSMISSION OF PRICES AND RISKS IN BURKINA FASO, MOZAMBIQUE AND TANZANIA

Market reforms in cotton producing countries under structural adjustment have increased the pass through from futures price movements to prices on the ground. Liberalization has involved the dismantling of national cotton boards that acted as a monopsony for seed cotton purchases under centralised marketing systems. In most cases, they also had a monopoly in

[11] For example, Weil Brothers Cotton, founded in 1878, announced in 2008 their exit from the cotton business as risks associated with cotton trade have become too large and Paul Reinhart America, a subsidiary of Paul Reinhart Switzerland, filed for bankruptcy (ICAC 2009).

primary processing (ginning), marketing and the provision of inputs to farmers (Larsen 2008). Under marketing boards, producer prices were set in advance of the planting season and farmers were guaranteed output markets and fixed prices. Most of these public monopolies were abolished and privatized as part of market reforms in the 1980s and 1990s. There was a shift towards market-based prices as minimum price setting and collective price stabilization instruments were largely abandoned. But this has taken place to varying degrees and there remains diversity in market organization and regulation across countries in SSA (e.g. Tschirley et al. 2009; Delpeuch and Leblois 2011). This section presents a comparative analysis of the ways in which global cotton futures prices are transmitted to local markets in relation to specific marketing structures and price setting institutions in Burkina Faso, Mozambique and Tanzania.

National marketing structures and price setting institutions

Burkina Faso

Until the gradual reforms of the late 1990s and 2000s, that included the scaling back of state control of the cotton company Sofitex, partial privatisation of two regional monopolies, and the formation of a farmers union (UNPCB), the parastatal (Sofitex) operated as a monopsony over the purchase of seed cotton from farmers in Burkina Faso (Kaminski et al. 2011). In the second half of the 2000s the sector experienced difficulties related to low world prices and a rigid domestic pricing mechanism (IMF 2014). In response, the "producer price mechanism" was adopted to better align domestic and world prices and a new smoothing fund was established (Kaminski et al. 2011). The cotton sector today is organized through a concentrated regional concession system with strong state involvement. Sofitex remains the dominant purchaser of seed cotton, accounting for 80 per cent of cotton production. The remaining 20 per cent of production is channelled via Faso Coton and Socoma. International traders Reinhart and Geocoton own shares in Faso Coton as well as Sofitex and Socoma. A single channel marketing system remains as the cotton company operating in each region has "exclusive purchasing rights" over all cotton in that region. At the same time, cotton companies guarantee purchase of all the cotton that farmers wish to sell. Cotton companies are required to provide credit, inputs and extension services to farmers and are responsible for transport.

A national purchase price for seed cotton for the entire season is fixed in advance. The so-called pivot price is negotiated amongst stakeholders within an inter-professional committee at the beginning of the season in April on the basis of a formula that aims to align producer prices with world prices. Initially, this formula included the three year average Cotlook A-index, and took into account the conversion rate between seed cotton and cotton lint and standard processing costs (Goreux 2006; Bellù and Tortora 2010). The Cotlook A-index has since been complemented by ICE futures price as the former was criticized for being under-representative of actual export prices as international traders increasingly refer to ICE futures (Bellù and Tortora 2010; Ecobank 2015). Unique to Burkina Faso's cotton marketing system are the two tier price system and the existence of a smoothing fund (fonds de lissage). Farmers are paid a floor price on delivery of seed cotton which amounts to 95 per cent of the pivot price less input costs received at the beginning of the season and a potential premium (ristourne) at the end of the season if the actual export price of cotton lint is above the floor price. The ex-post price of seed cotton is calculated using the average sales price during the season.[12] The smoothing fund – managed by a commercial bank – is aimed at reducing price risks for cotton companies.[13] The basic principle is that farmers are subsidized in years when world prices are low while the fund is replenished in years when prices are high (Kaminski et al. 2011).

Mozambique

A concession system has been a characteristic of the Mozambican cotton sector since the early 20th century. Farmers were forced to plant cotton during the colonial period. Independence and the nationalization of concession companies in 1975 saw significant declines in production. In spite of the civil war, the sector recovered in the late 1980s with the formation of public-private joint venture companies with exclusive buying rights within specified concession areas. Cotton production was further stimulated in the early 1990s with regained political stability, economic reforms and the granting of new concessions to private companies (Tschirley et al. 2009; Poulton et al. 2004). Today, the regional concession system

[12] The formula was changed in 2011 to not include the world price over the whole selling period (around 14 months) but exclude two month periods where cotton companies sold less than 1 per cent of national production to international traders. This led to the removal of some of the highest price months in 2010/11 when cotton prices reached its peak because cotton companies contracted to sell most of their cotton lint before the price surged. This change led to major protests by farmers (Gongo 2011).

[13] Such funds were widespread in WCA but many experienced financial problems in the 1990s given the long period of low cotton prices (Dana and Sadler 2012). The aim of the new smoothing fund in Burkina Faso was to smooth prices but not to stabilize at an absolute level with prices negotiated based on a formula to align them with world prices.

involves only private cotton companies each with a monopsony over their concession region. There are currently eleven cotton companies active in the sector. Among the largest are three international traders: Plexus (first), Olam (third) and China Africa (fifth), accounting for 38 per cent, 19 per cent and 8 per cent of production respectively. Large independent cotton companies include SANAM (second, 21 per cent) and SAN/JFS (fourth, 9 per cent).

A national minimum price system for seed cotton operates in Mozambique. The minimum price is established by the government following a negotiated proposal by the association of cotton companies (AAM) and farmers (FONPA). Initially, the proposed minimum price took into account the mean of the Cotlook A-index in the previous month, the exchange rate, the quality differential of Mozambican cotton lint compared with the A-index, freight and insurance costs, the conversion rate between seed cotton and cotton lint, other levies and costs, and the share received by producers which varies from 50 to 55 per cent (IAM 2014). According to a recent interview with a cotton company in Mozambique, ICE futures prices have increasingly been used as an international price benchmark in price negotiations, which finally led to the inclusion of ICE futures price in the official price formula. The minimum price is set in April/May, between six to eight weeks in advance of cotton marketing. In 2007 the system was amended with the introduction of an indicative price that was agreed upon by cotton companies and farmers in October/November, seven to eight months prior to purchasing to assist farmers' planting decisions. However, the indicative price is subject to change (Dias 2012). To date, there has not been a downward revision of the indicative price. In contrast to Burkina Faso, there is no binding supplementary payment if actual prices come to be higher than the minimum price and there is no stabilisation fund[14].

Tanzania

Prior to liberalization in 1993, all cotton processing and domestic marketing was handled by cooperative unions and primary societies whilst the Tanzania Cotton Marketing Board handled all exports. The Cotton Act of 1994 opened up cotton ginning and marketing to competition. Fixed producer prices were abolished and input markets were liberalised. Although the share of export prices received by farmers increased following reforms, liberalization resulted in the collapse of the credit and input supply system, causing declines in both the level and quality of production (Larsen 2008; Gibbon 1999; Baffes 2004; Bargawi

[14] But feasibility studies have been conducted by IAM and AAM.

2008). In view of the problems of input provision and quality, the state, via TCB, renewed its engagement in the sector with the Cotton Act 2001 (Bargawi 2008). Today, the sector remains open to competition with no restrictions on farmers' and ginners' choice of trading partners. There are a large number of private companies active in purchasing, ginning, and selling. More than 40 ginneries were registered with TCB but only around 25 were active in 2015. The top seven ginners account for 60-70 per cent of total seed cotton purchase. Olam is the only international trader involved in ginning and accounts for around 10 per cent of production.

After liberalization, fixed prices were replaced by indicative prices that are not formally binding – although transactions below the indicative price would contravene the Cotton Act of 2001. TCB sets the indicative price for each season based on a stakeholder consultation process in May which involve the associations of cotton buyers (TCA) and farmers (TACOGA). In negotiations, production costs of farmers, operational and transport costs of cotton companies, taxes and levies, the exchange rate and the world price are taken into account. Whilst the Cotlook A-index was historically taken as representative of the world price, ICE futures prices have increasingly featured in negotiations.[15] Indicative prices are announced before the opening of the official marketing season in June but can be revised subsequently in response to world price fluctuations (Salm et al. 2011). The indicative price fell for example during the 2005/06 season from 300 to 250 shillings and further owing to a fall in world prices[16]; in 2010/11, it was revised from 1,100 shillings to 800 shillings (Ngaruko and Mbilinyi 2014).[17]

Table 1 here

Price transmission and inter- and intra-seasonal price volatility

Our interviews confirm that the ICE cotton futures price has largely replaced the Cotlook A-index as the major benchmark around which export prices are negotiated between cotton

[15] A TCB official interviewed in 2014 described the technical process of setting the indicative price as the following: "Mostly it is the Cotlook A index and the New York Futures… from there we enter some of the variables like the exchange rate, the percentage of the lint from the cotton that the farmers produce; we also calculate the operating cost from the ginners: the transportation costs, the ginning cost, the overhead costs, in some cases we put also the margin (…)."

[16] The use of indicative prices was suspended in the following season and reintroduced in 2008/09.

[17] In 2009/10, low world prices led to a producer price below production costs and the government to provide a subsidy.

companies and international traders in all three countries, particularly as a consequence of the latter's engagement in derivatives markets.

> "Everybody is looking at New York futures." (Local agent interviewed in 2007)

> "The futures price is now by far the more important. It's what everybody looks at as a price guide." (Local ginner interviewed in 2014)

> "Trading is increasingly based on NY futures which gives us problems with our formula that is still based on Cotlook A. But we are discussing…" (Ginner interviewed in 2014[18])

This is also reflected in the national price-setting institutions. Even though price formulas continue to refer to the Cotlook A-index, there has been a reorientation towards the ICE futures price owing to the centrality of futures prices in physical trade. The price formula was adapted in Burkina Faso to reflect this change and the ICE futures price was recently included in the price formula in Mozambique. In Tanzania, there is no fixed formula for calculating the indicative price. As the ICE futures price is increasingly used in physical trade, it also features increasingly in negotiations around the indicative price. Hence, through price setting practices of international traders and national price setting institutions, inter-seasonal futures price variations are transmitted to each of the three case countries. Compared with other commodities such as coffee, PTBF contracts are however not as widely used in cotton trade. This is in part due to the relatively higher level of state involvement and minimum price arrangements in SSA cotton sectors. Our interviews show that larger cotton companies in Tanzania have experimented with PTBF contracts but these are not routinely used owing to the high risks involved and costs associated with price fixing and hedging.

Figure 2 indicates that the average annual export and producer prices in each of the three countries correlate with the average ICE futures price for the period 2000-2013. The absence of monthly price data at the national level does not permit a more detailed examination of the relationship between national and global prices. However, using annual prices, it can be

[18] This is a quote from a ginner in Mozambique. Since then, the formula has been adapted to include the ICE futures price.

shown that export prices[19] in Burkina Faso, Tanzania and Mozambique were on average 1.11, 1.07 and 1.00 times the average ICE futures price respectively. Differences in export prices across the three countries stem from differences in quality and the bargaining position of domestic cotton companies vis-à-vis international traders. The statistical relationship between annual export prices and the ICE futures price has strengthened since the mid-2000s with the correlation coefficient between the two increasing from 39 per cent and 61 per cent in the 1990s and 32 per cent and 54 per cent in the first half of the 2000s to more than 85 per cent between 2005 and 2013 in Burkina Faso and Mozambique respectively. A similar increase in the correlation coefficient between export and ICE futures prices was not seen in Tanzania since liberalisation in the early 1990s has already manifested a close relationship between export and world prices which continued accounting for 86 per cent between 2005 and 2013. Regarding volatility, the standard deviation for ICE cotton futures annual returns has increased from 17 per cent in the 1990s to 31 per cent in the period between 2000 and 2013. In particular, the strong price variations from 2006 to 2012 contributed to this higher volatility. This heightened inter-seasonal global price volatility has been increasingly transmitted to producing countries as a result of market reforms. The standard deviation of annual returns of export prices in the decade of the 1990s ranged from 14 per cent in Burkina Faso to 16 per cent in Tanzania and increased to 25, 22 and 33 per cent in Burkina Faso, Mozambique and Tanzania, respectively, for the period 2000 to 2013.

Annual producer prices[20] also follow ICE futures prices. For Mozambique and Tanzania, the correlation coefficient between producer and ICE futures price changes was around 70 per cent for the period from 2005 to 2013. In contrast, the correlation coefficient between producer and ICE futures price changes was just 55 per cent for Burkina Faso as a result of the smoothing effect of the three year average world price used for calculating producer prices. Once the second payment is taken into account the correlation coefficient increases to 86 per cent. At 46 per cent, producer prices[21] as a share of ICE futures prices were

[19] We use annual export prices from UN Comtrade which improves comparability between the three countries but may include differences to national sources. This caveat has to be taken into account.
[20] We use annual producer prices from FAO's MAFAP and compare them with national sources - UNPCB in Burkina Faso, TCB in Tanzania and IAM in Mozambique.
[21] For comparative reasons we convert national producer prices in US Dollars which eliminates exchange rate movements from the analysis. Shares are further calculated using the world average conversion factor of 0.42 from seed cotton to cotton lint. Such a simple inter-country price comparison is complicated, particularly given differences in production and transport cost structures, taxes and levies and ginning conversion factors in the countries in addition to exchange rate issues. But it still serves as an indicator of alignment between world and national prices in the three countries.

systematically lower in Mozambique than in Burkina Faso (61 per cent) and Tanzania (57 per cent). Both the fixed price system in Burkina Faso and the competitive system in Tanzania delivered producer prices that accounted for a higher share of the world and export price compared to Mozambique.[22] Whilst the price system in Mozambique secures a minimum producer price, the absence of a second post season payment (as in Burkina Faso) or price competition amongst cotton companies (as in Tanzania) means that increases in the world price are not passed onto farmers. The concentration and market power of international traders and their close ties with cotton companies, particularly in the context of increased vertical integration, is an issue in all three countries. The outcome of price negotiations between cotton companies and farmers thus also reflects the interests of international traders (Bellù and Tortora 2010).

Figure 2 here

How intra-seasonal price volatility is experienced differs across the three countries owing to differences in price setting institutions (Figure 3). That producer prices are set in advance of planting with a guaranteed buyer in Burkina Faso reduces the uncertainty that farmers face when making planting decisions and stabilizes their incomes. In Mozambique, a minimum price fixing meeting takes place prior to planting and is followed by a second meeting on the eve of marketing when prices might be adjusted in light of world price movements. Whilst this means that farmers are, in theory, exposed to world price volatility, there has been no downward revision of prices following the second meeting to date. By contrast, the indicative price in Tanzania is announced at the start of the marketing period with the possibility of revision. World price movements are thus transmitted to Tanzanian producers within a season and constitute a major concern for farmers. In addition to global price fluctuations, producer price movements in Tanzania exhibit a seasonal pattern, increasing gradually throughout the season before dipping at the very end of the marketing period. This owes to the high level of competition amongst ginners due to excess processing capacity (Bargawi 2008). Whilst there is no systematic data collected on within season price movements in Tanzania, evidence from our interviews indicates these volatility patterns.

[22] This questions the competition-coordination trade-off (e.g. Tschirley et al. 2009) as in our cases producer prices in the fixed price system are not generally lower in terms of farmers' share of world market prices than in the competitive system.

> "If NY goes up, you'll see the price goes up as well in the field. And if next day NY price goes down, you'll see the price going down later that day in the field." (Local ginner interviewed in 2014).

Figure 3 here

Price risks and price risk management

Inter-seasonal price risks are largely born by farmers in all three countries as the world price informs producer prices in both fixed price and competitive market systems. By basing producer prices on a three year average of world prices, the pricing formula in Burkina Faso has a slight smoothing effect on farmers' incomes compared with Mozambique and Tanzania. Farmers' in Burkina Faso face further less uncertainty in relation to their planting decisions since producer prices are guaranteed and set in advance of planting. In all three cases, farmers deal with uncertainty stemming from inter-seasonal price movements by diversifying across crops. This is most effective in Burkina Faso where fixed prices are known in advance of planting.

The impact of intra-seasonal price volatility on different chain actors, by contrast to inter-seasonal movements, varies considerably across the three countries. Figure 4 describes the extent to which local actors experience price risks and the differences in their ability to mitigate these risks within a season. As discussed above, cotton farmers in Tanzania are exposed to world price movements throughout the season and cotton ginners can transfer a part of the price risk that they face to farmers via their pricing strategies. The practice of indicative prices acts to limit the transmission of falls in the world price only to a certain extent. In Mozambique, risks associated with changes in the price between planting and marketing are born by farmers, in theory, since the minimum producer price can be revised. In practice, there have been no within season revisions to date. Once marketing begins, the minimum price system effectively transfers the risks associated with world price movements to cotton companies. In Burkina Faso, price risks are born by cotton companies over the entire season as prices are fixed before planting. The smoothing fund provides partial compensation for cotton companies in the event of price falls within the season. The Burkina Faso marketing system also means that neither cotton companies nor farmers fully benefit from positive price movements within a season since a proportion of export income generated is paid into the smoothing fund. The burden of price risk also falls on the government since it

is mandated to re-capitalise the fund should it be drawn down (as occurred in 2007) (IMF 2014).

The PRM strategies employed by different actors depend upon their exposure to world price movements which are conditioned by the institutional context, on the one hand, and their ability to undertake different PRM strategies, on the other. PRM strategies may be classified as physical or financial. Physical PRM strategies involve influencing the time of selling through storage, back-to-back trading that shortens the time that the actor has possession of cotton, and fixed price forward contracts.[23] Financial strategies involve hedging through futures and options on commodity derivative markets (Dana and Sadler 2012). In general, farmers have very limited access to PRM strategies. The high costs of storage and insurance, together with limited access to affordable credit, mean that only the wealthiest farmers are able to choose the time of sale (Bargawi 2008). As primary producer, farmers have no option to sell back-to-back. Forward contracts are typically unavailable since, in all three countries, the cotton marketing period is set by the government with transactions conducted in cash. Hedging instruments are completely out of reach to farmers owing to limited knowledge and access and high financial costs.

In Burkina Faso and Mozambique, cotton companies absorb the bulk of intra-seasonal price risks. The capacity of cotton companies to manage such price risks varies depending on their size and expertise. Most importantly, those affiliated to international traders have greater access to financial PRM tools. International traders generally hedge all or most of their trades on derivative markets through their specialized financial units. Local cotton companies tend not to engage in hedging as this is seen as too costly, risky and complex given their limited access to information, financial resources and brokerage services.[24] Further, trading on derivative markets is not adapted to the contexts of local actors in producing countries – for instance, the volumes traded by producers and local exporters tend to be very small compared to lot sizes of futures contracts. Although changes such as electronic trading have reduced

[23] There are also longer term strategies such as switching to niche and speciality product markets that are less affected by world price instability and diversification through selling a larger variety of products or increasing local processing.

[24] High costs accrue not only for purchasing the contracts themselves but also for financing margin calls. Futures require margins that are adjusted on a daily basis to reflect market movements. Financing become necessary when oscillations in the current price fall outside the margin that is set below the original purchase price by the futures contract. Financing margin calls can be very expensive and requires permanent access to financial resources. A problem of options is that the premium is expensive compared to futures contracts (ITC 2013).

transaction costs, financialized activities on exchanges, with its associated increase in short-term trading practices and related intra-day price volatility, have increased the financial costs of hedging owing to more frequent and unpredictable margin calls, as well as costs associated with monitoring market developments. Hedging on futures markets has become even more difficult for actors who do not have financial units and resources necessary to actively intervene in derivatives markets and weather losses associated with sudden adverse price changes. Even the largest state-owned cotton company in SSA, Sofitex, does not use futures or options because "hedging is too complicated and expensive and not part of our business focus that is the physical market" (Sofitex official interviewed in 2014). Exceptions to this are very few – with one or two local cotton companies in Tanzania having experimented with hedging together with PTBF contracts.

Hence, local cotton companies in all three countries are largely limited to physical PRM strategies, and rely upon fixed-price-forward contracts. Production risk - the risk of overselling - is an outcome of forward sales since contracts are often signed when actual production levels cannot be predicted. For this reason ginners in Tanzania have increasingly opted for back-to-back sales and spot transactions.[25] At the same time, international traders only buy forward from ginneries if they are confident that volumes can be guaranteed (ITC 2013). According to our interviews, all three cotton companies in Burkina Faso and the majority of companies in Mozambique use forward sales extensively for price risk management and as collateral for credit for the purchase of inputs. Forward sales by larger ginners in Tanzania tend to have a shorter time frame, of one or two months, compared with Burkina Faso and Mozambique. Smaller ginners in Tanzania cannot sell forward[26] and largely deal with price risks by securing large margins between the purchase price of seed cotton and the sale price for cotton lint. By contrast to Burkina Faso and Mozambique, a spinning sector exists in Tanzania which gives Tanzanian ginners the possibility to limit their exposure to price risks by selling to local spinners whose purchase price is less dependent on world prices compared with that of exporters. As one ginner explains:

> "This gives us more options and more room for negotiation and not only the one to one with international prices as in exports." (Local ginner interviewed in 2015)

[25] On local ginner stated for example: "1/3 of what we anticipate that we are going to do is sold as forward sales, 1/3 will be during the season on a back to back basis, and 1/3 will be speculative into the coming… into the end of the year." (interviewed in 2007)

[26] An increasing number of ginners in Tanzania have been blacklisted by the International Cotton Association for failure to honor contracts.

Figure 4 here

As discussed above, derivatives markets provide not only opportunities for risk management but also an arena for speculative profit making. In this way, access to hedging gives large multi-commodity international traders important advantages not only in dealing with price risks but also in relation to financialized accumulation. Local actors in cotton producing countries as well as smaller traditional cotton traders, by contrast, are excluded from opportunities to profit from financialized activities. Prevailing physical PRM strategies and price setting institutions that limit exposure to price movements also means that local actors are limited in their ability to profit from positive price movements.

CONCLUSIONS

The liberalisation of cotton marketing systems together with business strategies of international traders have resulted in greater transmission of price volatility on financialized commodity derivative markets to physical cotton chain actors. Our analysis shows however that the extent to which unstable futures prices are transmitted to producers depends upon the national market structures and prevailing price setting institutions. Inter-seasonal price instability is a reality in all three countries since producer prices are calculated on the basis of world prices: the Cotlook A-index and, increasingly, the ICE cotton futures price in all three price systems. Within season price volatility is a greater concern for farmers in Tanzania than it is in Burkina Faso and Mozambique where a fixed or minimum producer price means that price risks associated with intra-season volatility is largely born by cotton companies. In addition to fixed producer prices, Burkina Faso operates a smoothing fund that mitigates price risks faced by cotton companies. By comparison, the liberalized system in Tanzania means that also intra-seasonal world price fluctuations are transmitted to farmers to a larger extent.

Local actors have minimal possibilities to pursue financial PRM strategies given the high costs and risks involved. The same is true for smaller international traders that do not have the resources to actively engage with financial markets. Only ginners in producing countries affiliated to international traders hedge through their headquarters. Farmers have few alternative PRM options available other than adapting their production volumes from season

to season. In Burkina Faso and Mozambique cotton companies can sell through fixed-price-forward contracts to international traders – an option that smaller ginners in Tanzania's fragmented and competitive system rarely have as they cannot guarantee volumes and quality to international traders.

Uneven exposure to price instability and access to PRM strategies have important distributional implications. Whilst international traders have the capacity to deal with price risks through hedging in addition to expanding their activities and profit possibilities through pursuing financial trading strategies and providing financial services on commodity derivative markets, local actors in producing countries face the challenge of price instability and increased short-termism with very limited access to risk management. Financialization dynamics have given rise to opportunities and challenges for actors in the cotton commodity chain and, given the heterogeneity of actors, have tended to exacerbate existing inequalities in cotton trading. Large international and financially adept actors stand to gain from opportunities for speculation alongside hedging activities on derivative markets while local actors in producing countries and smaller international traders face greater challenges in an environment of price instability and short-termism.

National market structures can mediate uneven exposure to price risk and PRM but only to a certain extent. National structures can address and mediate local relationships and power asymmetries in producing countries to a certain degree by negotiating how price risks are shared amongst actors operating in the national marketing system. The national institutional context, particularly tripartite negotiation processes and strong independent farmers' unions or associations are crucial for outcomes that reflect farmers' interests. National structures alone however cannot fully address the major driver of inequality in incomes and risks, namely, unequal power structures in global commodity chains – the dominance of large international traders, in particular, and their increasing links to commodity derivative markets. Through acting on these markets they are in a position to determine prices along the cotton chain, to cope with price risks and to expand their financial activities and profit avenues.

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