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Can budget support to the cotton sector be used more efficiently?

An assessment of the policy support measures in Mali and Burkina Faso

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Can budget support to the cotton sector be used more efficiently? An assessment of the policy support measures in Mali and Burkina Faso

Hélène Gourichon[1], Bouréma Kone[2], Barthélémy Lanos[3] and Alban Mas Aparisi[4]

Abstract

In Burkina Faso and Mali, cotton is the most important cash crop, given its high contribution to the GDP and to the export sector revenue. Export of cotton lint accounted for 60 and 15 percent of the value of national exports, respectively, in 2014.

To maintain the level of cotton production, the two Governments support the sector. Indeed, the analysis based on the Monitoring and Analysing Food and Agricultural Policies (MAFAP) methodology show that producers received incentives of 21 and 12 percent in Burkina Faso and Mali, respectively, between 2005 and 2012 (nominal rate of protection [NRP]).

The analysis provides insights on the level of domestic price protection that compensates price distortions resulting from on one hand, exogenous causes namely the international price distortions and the exchange rate misalignment and on the other hand, endogenous inefficiencies such as the high transport or processing costs. Two adjusted NRP are computed, one using an adjusted benchmark price for cotton that is netted out of policy interventions at the international level (Anderson and Valenzuela, 2006) and one using an alternate, non-misaligned exchange rate (BCEAO, 2013). The value chain inefficiencies are then discussed, using the market development gap indicator which reveals that higher producer price could be obtained if inefficiencies were corrected through sound investment policies.

Finally, a budgetary allocation analysis is proposed, along with the computation of nominal rates of assistance that reveal the full extent of policy support to the cotton value chain. Price intervention, with other cotton-related budgetary transfers, represented 9 percent of food and agricultural expenditure in Burkina Faso between 2006 and 2012 and 31 percent in Mali.

Keywords: Mali, Burkina Faso, cotton price distortions, budgetary transfers

JEL Codes: Q180

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Table of contents

1. Introduction 1
2. Price distortions for cotton in Mali and Burkina Faso 2
3. Budgetary transfers in support of cotton in Mali and Burkina Faso 7
4. Market inefficiencies in cotton value chains in Mali and Burkina Faso 10
5. Conclusion 12
References 13

1. Introduction

Mali and Burkina Faso form part of the fifteen main cotton producer countries in the world, although their combined cotton lint output, between 2005 and 2012, accounted for a limited 1,4 percent of the world total volume of production (ICAC, 2014). Additionally, the two West African countries are net exporters of the commodity and contribute, together, to an average 4 percent of world cotton lint exports over the same period (ICAC, 2014). Mali and Burkina Faso are the leading cotton exporting countries in Africa. With Chad and Benin, they are referred to as the Cotton Four (C4) of Africa.

Cotton is key to Mali and Burkina Faso's economies. Cotton lint is the second export overall, after gold, for both countries (AfDB, OECD and UNDP, 2014a, 2014b,). In 2013, it represented, respectively, 60 percent and 15 percent of Burkina Faso and Mali's export revenue (Lanos and Ouedraogo, 2014; AfDB, OECD and UNDP, 2014b) as well as 12 percent (in 2011) and 1 percent of Burkina Faso and Mali's gross domestic product (Kaminski, 2011; AfDB, OECD and UNDP, 2014b). Cotton is essentially grown by smallholders in the two countries: it affects the livelihood of three million individuals in Mali (FAO, 2012) and six million in Burkina Faso (Lanos and Ouedraogo, 2014). The two countries, especially Burkina Faso, are therefore heavily reliant on the cotton sector for their economic development. Due to their limited weight in the international market of cotton, they are nonetheless price-takers.

The international market of cotton has been unfavourable to Mali and Burkina Faso from 2005 to 2009, with particularly low nominal prices, standing at an average 1 410 USD/tonne of cotton lint.[5] World production was indeed above demand from 2005 to 2008, fuelled by the surge of cotton supply in China and India that followed the elimination of the Multi Fibre Arrangement in 2005.[6] The end of the agreement opened the developed countries' market to emerging economies and accelerated cotton production and exports from South-East Asia. Cotton lint production jumped by 20 percent in China and 16 percent in India between 2006 and 2007 (ICAC, 2014). Additionally, several countries claimed that the United States of America, the top exporter of cotton in the world since at least the 1920s (ICAC, 2014), was distorting international prices due to its domestic cotton subsidies policies that resulted in oversupply. Brazil initiated a dispute settlement case in the World Trade Organization (WTO) in 2002 to challenge the United States of America (USA) subsidy programmes' compliance with WTO rules.[7] The C4 countries also voiced their concerns about the USA cotton subsidies in the WTO Ministerial Conferences of Cancun (2003), Hong Kong (2005) and Bali (2013), as part of the Doha Development Agenda.

The cotton market underwent significant changes after the global economic crisis that started in 2007 and 2008.The world production of cotton dipped by 7.9 percent from 2008 to 2010 (ICAC, 2014), as the sector's agents anticipated a decrease in demand due to the economic downturn. There was effectively a situation of oversupply in 2009, with plunging Chinese imports, that depressed international prices by 6.3 percent (World Bank, 2014). However, the international prices of cotton skyrocketed in 2010 and 2011. An 89 percent increase was registered between the 2010-2011 and 2005-2009 periods. Indeed, the demand from China rebounded more rapidly than expected in these two years, while the supply underwent various shocks, such as floods (Pakistan, Australia) and export-restricting policies (India). Historically high prices led USA to freeze its direct subsidies to cotton producers in 2011 and 2012 and move towards crop insurance payments (ICAC,

[5] Measured by the ''Cotlook A'' index, that is computed as the simple average of the day's cheapest five quotations (no more than two West African quotations are included) of the main cottons that are traded on the global market. Mali and Burkina Faso's cotton quotations can thus be included in the Cotlook A index on any given day.

[6] The arrangement restricted textile exports from developing countries to developed countries. It expired in January 2005 and textile was brought under the jurisdiction of the World Trade Organization.

[7] In October 2014, the United States of America and Brazil announced that they had reached agreement to settle the dispute.

2012, 2013). This policy shift is reflected in the 2014 Farm Bill. China, in the meantime, implemented a minimum price policy[8] and started to constitute national stocks that maintained international prices above pre-2010 levels. The prices started to decline in 2012, however, as global supply recovered. The expected release of China's national reserves in the 2014 or 2015 should accelerate this trend. The demand for cotton may continue to decline in the near future due to the growing trend for synthetic fiber clothes (Wexler, 2014).

The international context is thus characterized by unpredictable cotton prices and overall output levels that are affected by top producing countries' policies. These facts are peculiarly important for Mali and Burkina Faso, given the weight of cotton in their economies. The countries' vulnerability to external factors, when it comes to cotton, is further exacerbated by the fact that they belong to the CFA franc monetary zone. The CFA franc is pegged to the EUR, and the fluctuations of the EUR/USD exchange rate hence create additional uncertainty for West African cotton exports.

Mali and Burkina Faso thus rely on policy interventions to hedge prices on one hand and support producers on the other hand. In Mali, the only ginning company is the *Compagnie Malienne pour le Développement du Textile* (CMDT). A parastatal company created in 1974, CMDT is state-owned at 60 percent since that date (Gourichon and Koné, 2014). The CMDT operates along the whole value chain, from input provision to export. The Malian State provides input subsidies through the CMDT, and has also implemented a price stabilization mechanism as well as on-farm training and irrigation programmes aimed at supporting cotton production. The Société Burkinabè des Fibres et Textiles (SOFITEX) was liberalized in 1999 but the State retains 36 percent of the shares (Baffes, 2007). The SOCOMA and Faso Coton, two additional private companies, were created in 2004. Burkina Faso also supports cotton through input subsidies, extension and infrastructure programmes, as well as a price stabilization system.

Such policy measures distort domestic cotton prices and have an important budgetary cost for the governments of Mali and Burkina Faso, and for donor countries as well. The level and structure of policy support for the cotton sector in the two countries from 2005 to 2012 is analysed below, and its budgetary implications are discussed.

2. Price distortions for cotton in Mali and Burkina Faso

The distortion of domestic cotton prices in West African countries has been previously studied. Baffes (2007), Anderson and Masters (2009) and Delpeuch and Poulton (2011) have produced notorious analyses on the topic. More recently, Balié (2012), Guissou and Ilboudo (2012), Lanos and Ouedraogo (2014) and Gourichon and Koné (2014) have added to these contributions, in the framework of the Food and Agriculture Organisation of the United Nations (FAO)'s Monitoring and Analysing Food and Agriculture Policies' (MAFAP) programme.

All the studies aforementioned rely on the computation of Nominal Rates of Protection (NRP) and Nominal Rates of Assistance (NRA) to estimate the price distortions. Baffes (2007) reports that Mali and Burkina Faso have created price incentives to cotton producers from 1998 to 2005, with average NRPs of 13 percent for both countries.[9] The ginning companies, of which the State has been either a major shareholder (Burkina Faso) or the main shareholder (Mali), offered particularly high prices to producers in order to boost cotton production and cover high input costs, whereas world prices were globally low (Baffes, 2007).

[8] China became the main provider of cotton subsidies in the world in 2011, which has remained unchanged ever since (ICAC, 2011).

[9] Baffes, 2007 reports the NRP as follows: >100 Taxation<100. Thereby, in Mali and Burkina Faso, the NRP was 113 for the period 1998-2005. For the sake of comparison, the NRPs calculated by Baffes, 2007, were converted to the MAFAP measure, namely >0 Taxation <0.

The NRP (1) and NRA (2) 2222222are long and well established indicators of the incidence of policies (Krueger, Schiff and Valdés, 1988; Monke and Pearson, 1989). In the case of Burkina Faso and Mali, they have been computed by FAO's MAFAP programme for the 2005-2012 period. MAFAP's methodology[10] is adapted from the Organisation for Economic Co-operation and Development (OECD)'s Producer Support Estimate (PSE). The NRP and NRA aim to measure the level of policy support provided to agricultural producers.

In order to compute the indicators, reference prices at farm gate (RP_{fg}) are calculated from a benchmark international price of the commodity analysed[11] and the access and marketing costs along the value chain from the farm-gate to the border.[10] The reference prices at farm gate are estimated to reflect a price free of domestic policy and market distortions and free of value chain inefficiencies. The reference prices at farm gate are compared with the observed prices[12] in order to derive a price gap at farm-gate (PG_{fg}). The NRP at farm-gate (NRP_{fg}) is then calculated by dividing the price gap by its corresponding reference price and is expressed as a ratio. The NRP equation is presented below:

$$\boldsymbol{NRP_{fg} = \frac{PG_{fg}}{RP_{fg}}} \qquad 1$$

Where NRP_{fg} is the nominal rate of protection at farm-gate, PG_{fg} is the price gap at the farm-gate level and RP_{fg} is the reference price calculated at farm-gate.

If the NRP is positive, this means that policies and market performance result in a net protection of producers and there are incentives to production; if the NRP is negative, this reveals net taxation of producers and thus disincentives to production.

The Nominal Rate of Assistance (NRA) is generated by adding the public expenditure allocated to the commodity to the price gap at farm gate. It summarizes the incentives due to policies, market performance and budgetary transfers. The NRA equation is presented below:

$$\boldsymbol{NRA_{fg} = \frac{PG_{fg} + PE}{RP_{fg}}} \qquad 2$$

Where *NRA* is the nominal rate of assistance at farm-gate, PG_{fg} is the price gap at the farm-gate level, RP_{fg} is the reference price calculated at farm-gate and *PE* the public expenditure allocated to the commodity.

The 2005-2012 period was a time of policy innovations for the cotton sector in Mali and Burkina Faso. In 2005, Mali implemented an indirect State intervention system, the so-called "cotton price mechanism". Under this mechanism, the cotton interprofession association (IPC)[13] announces a

[10] More information about the methodology is available in the MAFAP Methodological paper (FAO, 2015), on the MAFAP website.

[11] For Burkina Faso, the benchmark international price of cotton is estimated using the Cotlook A Index. Since, the Index is expressed as a CIF price, it is adjusted using the transport costs from East Asia to West Africa. For Mali, the average export price as reported by CMDT is used as the benchmark international price. In both countries, exports are controlled by the parastatal companies that negotiate export prices for all domestic production.

[12] The observed prices at farm gate are reported by the parastatal companies in both countries. They offer annual single prices to all producers.

[13] The IPC is composed of members from the cotton producers' associations and the cotton companies (CMDT and the Office de la Haute Vallée du Niger, a partner cotton producing company).

minimum pan-national price at the beginning of the cotton planting season. This price covers all costs of production and includes the value added of the work force – it is disconnected from the cotton international price dynamics. The CMDT gathers cotton seeds from producers, extracts the fiber and sells it on the international market. A final price to producers is then calculated by the IPC, based on the volume sold, the level of the Cotlook A index and the revenue obtained through the sales. Two scenarios can occur:

(i) If the final price is above the minimum price, the CMDT pays the minimum price to producers, plus a "bonus" that represents 60 percent of the surplus resulting from the cotton sales. Out of the 60 percent, a share of 9 percent is deducted to supply the price stabilization fund. Forty percent of the surplus goes to the CMDT.
(ii) If the final price is below the minimum price, the stabilization fund is used by the CMDT to pay the difference between the two prices.

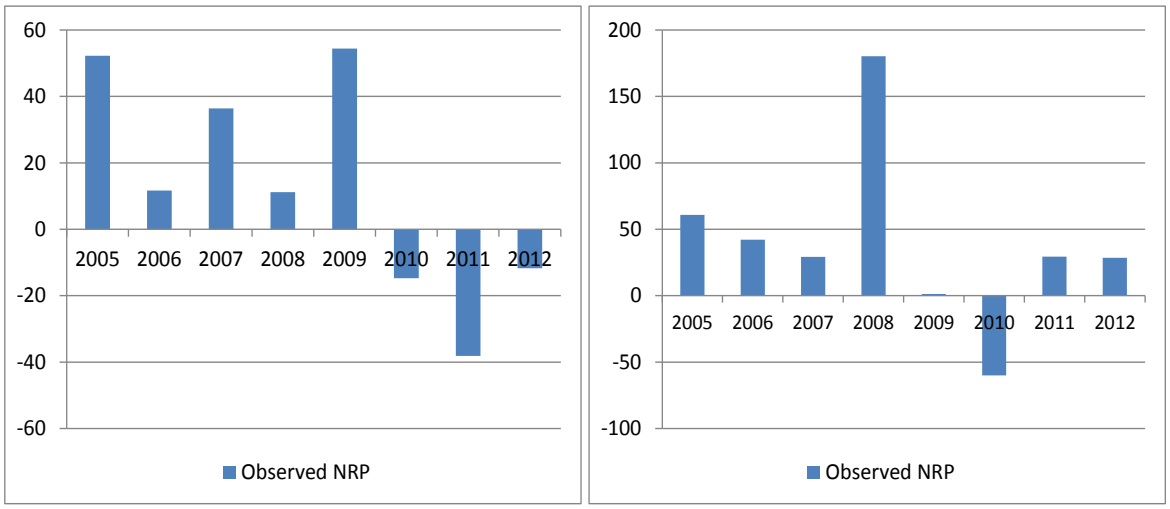
In Burkina Faso, a similar mechanism existed until 2007. In that year, a new ''smoothing fund system'' was implemented, with the support of the French Development Agency (AFD). Under the smoothing fund system, a pivot producer price for cotton is calculated by a local bank, the Bank of Africa, and reviewed by the Government, the AFD and the Burkina Faso Cotton Growers Association (AICB)[14]. The Bank of Africa calculates the pivot price on a formulaic basis (hence differing from the Mali system), deriving it from the triennial average of the Cotlook A Far East index expressed in CFA francs (International Monetary Fund, 2014). At the beginning of the planting season, the AICB announces a pan-national floor price, at 95 percent of the pivot price, and a ceiling price, at 101 percent of the pivot price, thereby creating a dissymmetric price tunnel. When producers hand in their harvested cotton seeds to the ginning companies, they receive the floor price. The AICB then calculates a final price, based on the effective Free on board (FOB) price for cotton obtained by the ginning companies. Three scenarios can occur:

(i) If the final price is above the price ceiling, producers receive the ceiling price and a share of the price surplus. Another share of the surplus is given to the ginning companies, whereas the last share goes to the smoothing fund. The share of the surplus that is allocated to producers, companies, and channelled into the fund is determined on a formulaic basis that uses the magnitude of the surplus and the amount already saved in the smoothing fund as variables.
(ii) If the final price is between the ceiling and floor prices (in the tunnel), producers receive the final price.
(iii) If the final price is below the floor price, producers receive the floor price and ginning companies are compensated for their losses by the smoothing fund.

From 2005 to 2012, the cotton sector received price support amounted to 39 percent on average in Burkina Faso and 13 percent in Mali. Two periods can be distinguished: 2005-2009 and 2010-2012 (Figure 1).

[14] The AICB is composed of members from the National Producers Association of Burkina Faso (UNPCB) and from the three cotton ginning companies (SOFITEX, SOCOMA and Faso Coton).

Figure 1. Observed nominal rates of protection on cotton in Mali (left) and Burkina Faso (right), 2005-2012 (percentage)



Source: Authors, based on Gourichon and Koné (2014) and Lanos and Ouedraogo (2014).

From 2005 to 2009, producers in both countries received price incentives, with an average of 33 percent in Mali and 63 percent in Burkina Faso. This stands higher than the average calculated by (Baffes, 2007) for the 1998-2005 period for both countries namely 13 percent. The magnitude of the NRPs in the 2005-2009 period can be explained by three factors: the depressed international prices and the exchange rate overvaluation – that led to low FOB prices – and low productivity of the cotton value chains in the two countries, that pushed the governments to set high minimum prices (see Section 4).

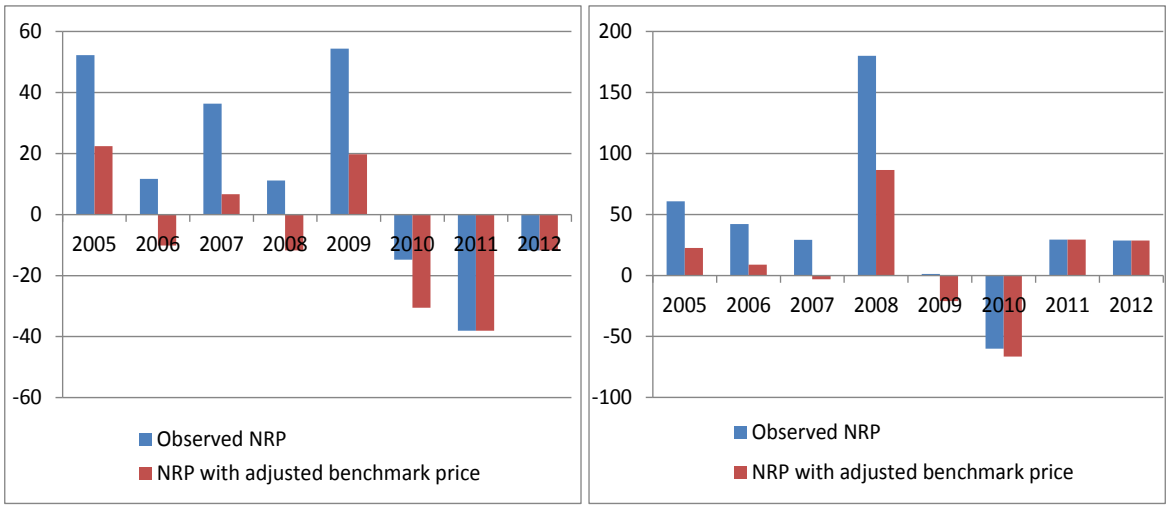
On the first factor, several studies[15] have pointed out that the USA, and to a lower extent China and the European Union (EU) cotton subsidy programmes, were leading to major international price distortions for cotton. Wubeneh (2006) calculated that the PSE[16] of the cotton programmes was approximately 35 percent in the US and 28 percent in EU due to the policy support to the sector. Anderson and Valenzuela (2006) estimated that the removal of all subsidies and tariffs on cotton, in the world, would lead to an increase of the international prices of 12,9 percent. He also notes that the subsidies removal alone would contribute to eight-ninth of the price increase. This calculation is hereby used as a proxy to determine an adjusted international benchmark price free of distortions for the 2005-2009 period. Indeed, the surging world prices, in 2010, have led exporting countries to freeze or remove most of their subsidies. The NRPs, with the adjusted benchmark price,[17] averaged 19 percent and 5 percent in Burkina Faso and Mali, respectively, over the 2005-2009 period (Figure **2**). The NRPs do show interannual variations, and shoot up to 22 percent (2005) and 20 percent (2009) in Mali. They are nonetheless much closer to a minimal level of distortions than the observed NRPs. This reveals that high artificial domestic prices in Mali and Burkina Faso, when compared to international prices, were partly meant to compensate for distorted international cotton prices from 2005 to 2009. The floor producer prices were indeed set on a non-formulaic basis in both countries until 2007.

[15] The academia undertook the majority of these studies after Brazil initiated a dispute against the United States of America's cotton subsidy programmes in the WTO, in 2002. Several studies evaluate the impact on prices and income of potential trade agreements related to international cotton subsidies and tariffs. See for instance Poonyth *et al.,* 2004, Anderson and Valenzuela, 2006 and Jales, 2010.

[16] Formerly known, and referred to in Wubeneh, 2006 as the Producer Subsidy Equivalent

[17] By using alternative approaches to adjust the benchmark price, the results could differ from the results obtained in the framework of this analysis.

Figure 2. Nominal rates of protection, observed, and with the benchmark price adjusted for international subsidies and tariffs on cotton in Mali (left) and Burkina Faso (right), 2005-2012 (percentage)

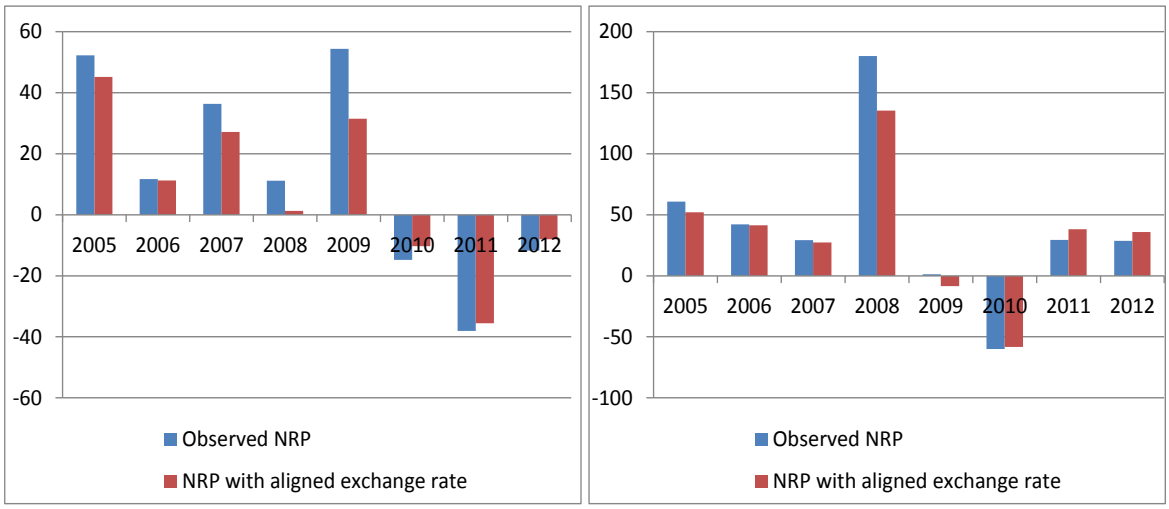


Source: Authors, based on Gourichon and Koné (2014), Lanos and Ouedraogo (2014) and Anderson and Valenzuela (2006).

The second factor, the misaligned exchange rate, has added to domestic price distortions. Indeed, during the 2005-2009 period, the exchange rate was considered overvalued. A study by the Central Bank of West African States (BCEAO, 2013) estimated a 2.6 percent overvaluation of the CFA franc to USD exchange rate, on average, in the CFA franc zone over that period[18]. The overvaluation increased from 2006 to 2009 reaching 4.9 percent in 2009. One should note that the exchange rate misalignment is not a domestic policy, as the exchange rate policy of the CFA franc is an attribution of the West African Economic and Monetary Union (WAEMU). In addition, the CFA franc is pegged to the EUR, and thus the fluctuations of the CFA franc against the USD much depend on the EUR to USD variations. The annual misalignment reported by the Central Bank of West African States (BCEAO) is hereby used to calculate another alternative benchmark price and compute NRPs that would have prevailed if the CFA franc to USD exchange rate were aligned. The adjusted NRPs show that a well-aligned exchange rate, from 2005 to 2009, would have resulted in higher FOB prices in CFA franc and thus lower domestic price distortions: 49 percent in Burkina Faso (as opposed to 63 percent with the misalignment) and 23 percent in Mali (33 percent) (Figure 3) for the period 2005-2009.

[18] Etta-Nkwelle, Jeong and Fanara (2010) estimated a much stronger overvaluation of 20 percent from 2007 to 2010.

Figure 3. Nominal rates of protection, observed, and with the benchmark price adjusted for exchange rate misalignment in Mali (left) and Burkina Faso (right), 2005-2012 (percentage)



Source: Authors, based on Gourichon and Koné (2014), Lanos and Ouedraogo (2014) and BCEAO (2013).

In 2010, the international prices spiraled up unexpectedly, and owing to its functioning, floor prices in the two countries could not reflect this price increase. The reference producer prices calculated based on the FOB price thus went well above the price ceiling (Burkina Faso) and the minimum price (Mali). Part of the bonus between the cotton lint sale price perceived by the ginning companies and the floor prices was used to fill the price stabilization funds. The same phenomenon seems to have occurred in 2011 in Mali. Producers did not receive the reference price equivalent and faced price disincentives of -26 percent, on average, for the two years. However, since in Burkina Faso, the floor price is calculated based on the triennial average of the Cotlook A index, the floor price reflected the price peak of 2010, therefore, producers received price incentives to production. Again in 2012, Malian cotton producers were taxed whereas Burkina Faso producers were supported. Indeed, the price mechanism in Mali is not aligned on international prices but on domestic production costs. Although international prices decreased, the price offered to producers by the CMDT remained slightly below the reference price derived from the FOB price. In Burkina Faso, the high international prices of 2010 and 2011 resulted in lofty floor prices established at the beginning of the 2012 campaign, whereas the international prices decreased afterwards. Producers hence received price incentives, and the smoothing fund was used to compensate ginning companies. In addition, the BCEAO considers that the exchange rate was undervalued by 2.8 percent from 2010 to 2012. This tended to increase the border price in CFA francs and boost exports thus, resulting in an improved environment at domestic level.

In Mali and Burkina Faso, the indirect State support through prices came at a cost. In Burkina Faso, the SOFITEX had to be recapitalized in 2006 and 2008, following sizeable losses due to – according to the Finance Minister of Burkina Faso himself – the "low world cotton prices, the appreciation of the CFA franc and high prices paid to farmers" (IMF, 2007 in Dana and Gilbert, 2008). Following this event, the "smoothing fund system" was implemented. In Mali, the CMDT's financial situation is "catastrophic" (Diakité, 2010), having registered profit "only twice between 1997 and 2004" (Baffes, 2007). The two countries authorities also provide direct support to the cotton sector, with input subsidies and agricultural infrastructure programmes

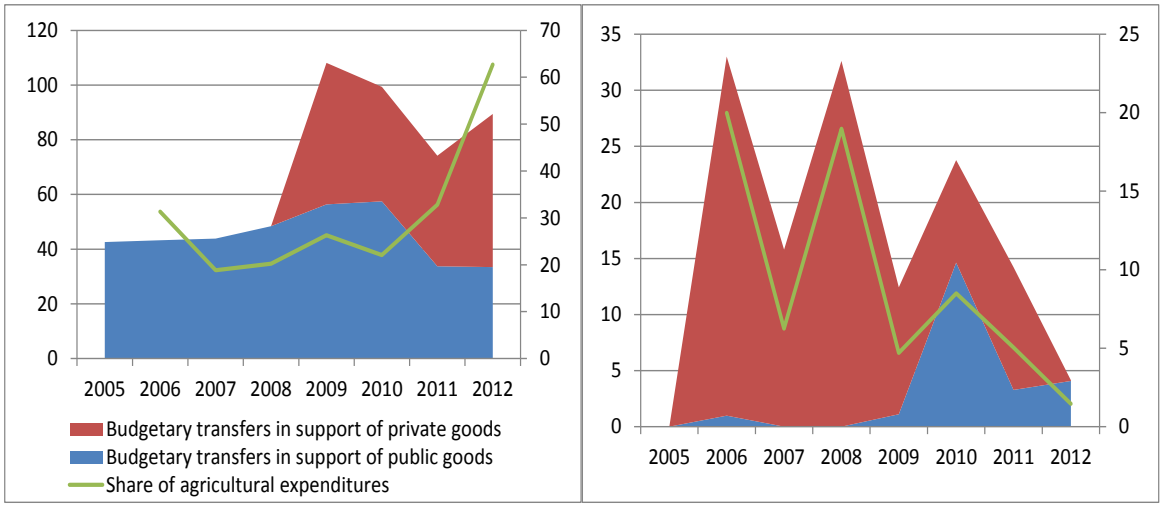
3. Budgetary transfers in support of cotton in Mali and Burkina Faso

The MAFAP database provides information on public expenditures in support of food and agriculture in ten African countries, including Burkina Faso and Mali, for the 2006-2012 period. The data is highly

disaggregated and allows identifying the level and composition of budgetary transfers in support of cotton.[19]

Two types of budgetary transfers in support of the cotton sector are hereby presented: subsidies to public goods (off-farm irrigation and feeder roads mainly) and subsidies to private goods (seeds, fertilizers, on-farm equipment). Total subsidies, in nominal values, are divided by the production of cotton seeds, in volume, and are expressed as CFA francs per tonne. Overall, in Mali, subsidies to cotton production marked a clear nominal increase from 2009. They went from 44 530 CFA francs per tonne, on average, during the 2005-2008 period, to 92 763 CFA francs per tonne, on average, during the 2009-2012 period (Figure 4) due to the implementation of the input subsidies programme in 2009. The share of agricultural public expenditures in support of cotton shot from an average of 25 percent (2006-2009) to 33 percent and 63 percent in 2011 and 2012 respectively. The latter year, Mali faced a political and security crisis that led to donors freezing their aid. Support to cotton, which is mainly based on national funds, thus took a disproportionate share of total agricultural expenditures. In Burkina Faso, subsidies fluctuated during the 2005-2012 period, peaking at 33 009 CFA francs per tonne in 2006, 32 622 CFA francs per tonne of cottonseed in 2008 and 23 775 CFA francs per tonne in 2010. The high level of expenditures in 2006 and 2008 corresponds to the recapitalization of the SOFITEX and the provision of an initial stock for the smoothing fund, which ought to be exceptional (World Bank, 2013). The budgetary support to cotton indeed fell from 16 percent of total agricultural expenditures (2006-2008) to 5 percent (2009-2012).

Figure 4. Budgetary transfers in support of private and public goods for the cotton sector in Mali (left) and Burkina Faso (right), in thousand CFA francs per tonne of cottonseed produced (left axis) and as a share of agricultural expenditures (right axis), 2005-2012[a]



Source: Authors, based on FAO (2014), Gourichon and Koné (2014) and Lanos and Ouedraogo (2014).

[a]*Note:* For Burkina Faso, data was not available for the year 2005. For Mali, the share of agricultural expenditures was not available for the year 2005.

The two countries followed opposite paths in terms of their cotton subsidies' structure. Although both Mali and Burkina Faso heavily relied on the ginning companies to subsidize cotton producers, in Mali, the CMDT and the partner company, Office de la Haute Vallée du Niger (OHVN) were chiefly tasked with public good support until 2009; whereas the SOFITEX, in Burkina Faso, focused on private input subsidies until that same year. From 2009 however, Mali started to shift its subsidy balance towards private inputs, in order to boost a production that was dwindling after several years of depressed international prices. In addition, although international prices augmented strongly, so did

[19] The MAFAP methodology for classifying public expenditures is adapted from OECD's PSE methodology. MAFAP's methodology can be found here: http://www.fao.org/in-action/mafap/products/tool-methodology/en/.

fertilizer prices, which forced authorities to shield producers so that they could benefit from the cotton price surge. While no public expenditure targeted the provision of private goods during the 2005-2008 period, they represented 51 percent of cotton public expenditures on average from 2009-2012. Furthermore, the government cleared, in 2009, the debts of cotton cooperatives towards the CMDT.[20] Notwithstanding this shift, Mali maintained a steady support to the cotton sector through the provision of public goods. In 2010, the C4 countries indeed started to implement the Support Programme to the Cotton Value Chain (PAFICOT), funded by the African Development Bank. The PAFICOT was launched with the objective to improve domestic cotton value chains in C4 countries, in the context of low international cotton prices. The PAFICOT[21] focuses on public goods support, such as off-farm irrigation and feeder roads, but also training and extension services to producers' cooperatives. In Burkina Faso, the PAFICOT and other long-term development programmes have gradually become the main source of budgetary support to the cotton sector. The government has strongly decreased its fertilizer and seed subsidies to the sector: they went from 99 percent (2005-2008) to 58 percent (2009-2012)[22] of total budgetary transfers in support of cotton.

The Nominal Rate of Assistance (NRA) measures the level of policy support to cotton producers through prices and budgetary transfers. It is therefore more encompassing than the NRP. The average NRA was, as could be expected, higher than the NRP in both countries over the 2005-2012 period. In Burkina Faso, it reached 54 percent (against 39 percent for the NRP), and in Mali, it went up to 52 percent (against 13 percent for the NRP) (Figure 5). From 2005 to 2009, in a context of depressed international prices, Mali and Burkina Faso provided comparable policy support to their cotton production, with a mix of protection through prices and private input subsidies. Mali's budgetary support to cotton, in comparison to its protection through prices, was loftier than Burkina Faso's. The difference between Mali's NRA and NRP was of 45 points, on average, between 2006 and 2009, against 26 percent for Burkina Faso.

During the international price peak, although producers were slightly taxed[23] in Mali in 2010, they were protected overall when budgetary transfers are taken into account. In Burkina Faso, the budgetary transfers did not fully eliminate the effect of price taxation in 2010, and the NRAs lied at -55 percent.

Despite the hefty level of support to cotton in both countries, the production costs appear crucial in the supply response to policy support. Indeed, although NRAs in Mali were of 59 percent between 2005 and 2008, the number of cotton producers diminished by 25 percent during this period (compound annual growth rate), suggesting that the absolute price levels and costs of inputs remained too high and drove producers to more profitable crops (Gourichon and Koné, 2014). In Burkina Faso, cottonseed production has been completely stagnant since 2005, with an average growth rate of 0.04 percent (Lanos and Ouedraogo, 2014).

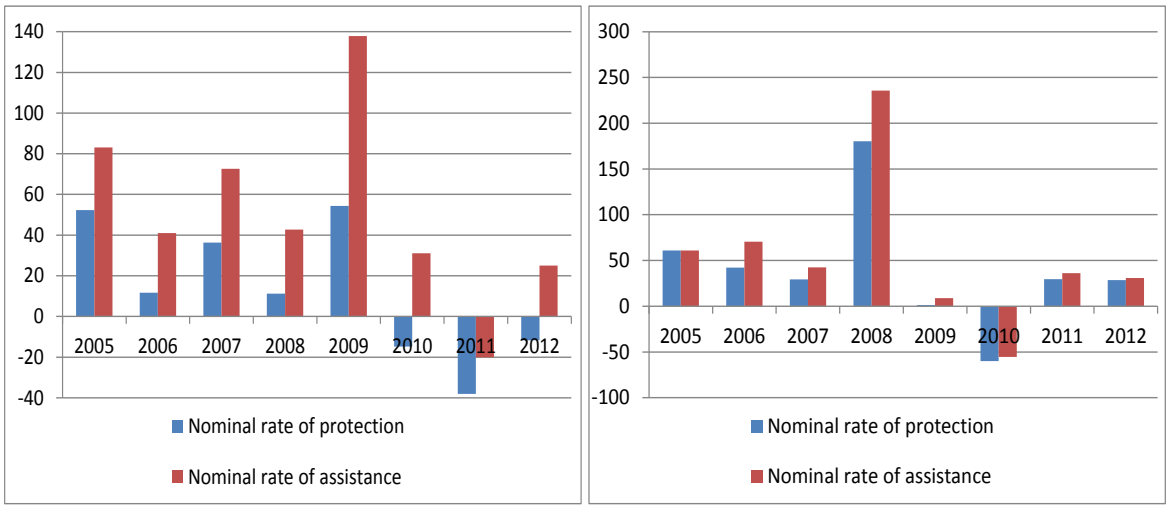
[20] An economic interest group that comprises the CMDT, the OHVN, producer organizations and the State borrows from a pool composed of national and international banks. The CMDT uses the funds to buy inputs, which are then provided free of charge to cotton producers' cooperatives at the beginning of the planting season. The non-subsidized cost of inputs is deduced from the cooperatives' revenue paid by the CMDT. For several years, the CMDT did not apply this deduction, however, and cooperatives became indebted to the CMDT.

[21] For both countries, expenditures allocated to the cotton sector in the framework of the PAFICOT were included in the estimation of the budgetary support.

[22] As of 2014, the government of Burkina Faso was on the verge of launching an Input Fund that would be used as a collateral for ginning companies to obtain credit from the banks at lower costs (IMF, 2014).

[23] Most certainly in order to refill the stabilization fund, see section 2, page 8.

Figure 5. Nominal rates of assistance and nominal rates of protection in Mali (left) and Burkina Faso (right), 2005-2012 (percentage)



Source: Authors, based on Gourichon and Koné (2014), Lanos and Ouedraogo (2014).

4. Market inefficiencies in cotton value chains in Mali and Burkina Faso

The limitations of the NRA in assessing the extent of policy distortions have been raised before. For the cotton sector in West Africa, in particular, Delpeuch and Poulton (2011, p. 5) have recalled that the "NRA calculation will incorporate both the effects of government policy and impacts of private market imperfections on producer pricing". The methodology for measuring NRPs and NRAs is indeed derived from OECD's PSE and conceived for the analysis of developed countries' agricultural policies. It is not perfectly appropriate for developing countries, where market imperfections weigh importantly on domestic prices. The MAFAP methodology has attempted to remedy this issue by creating the Market Development Gap (MDG) indicator, which measures the effect of market underdevelopment on price gaps.

The MDG[24] (2) is the portion of the price gap that can be attributed to "excessive" or inefficient access costs within a given value chain and imperfect functioning of international markets. "Excessive" access costs may result from factors such as poor infrastructure, high processing costs due to obsolete technology, government taxes and fees that are not associated with a service, high profit margins captured by various marketing agents, bribes and other non-tariff barriers. The total MDG at farm gate is comprised of two components: access costs gap between the border and the wholesale level (ACG_{wh}), and access costs gap between the wholesale and farm gate level (ACG_{fg}).

The MDG is an absolute measure, but it can also be expressed as a ratio to allow for comparison between years, commodities, and countries. The MDG (MDG_{fg}), in relative value, is calculated as the ratio between the total access costs gap and the adjusted reference price at farm gate (RP_{fg}),[24] as follows :

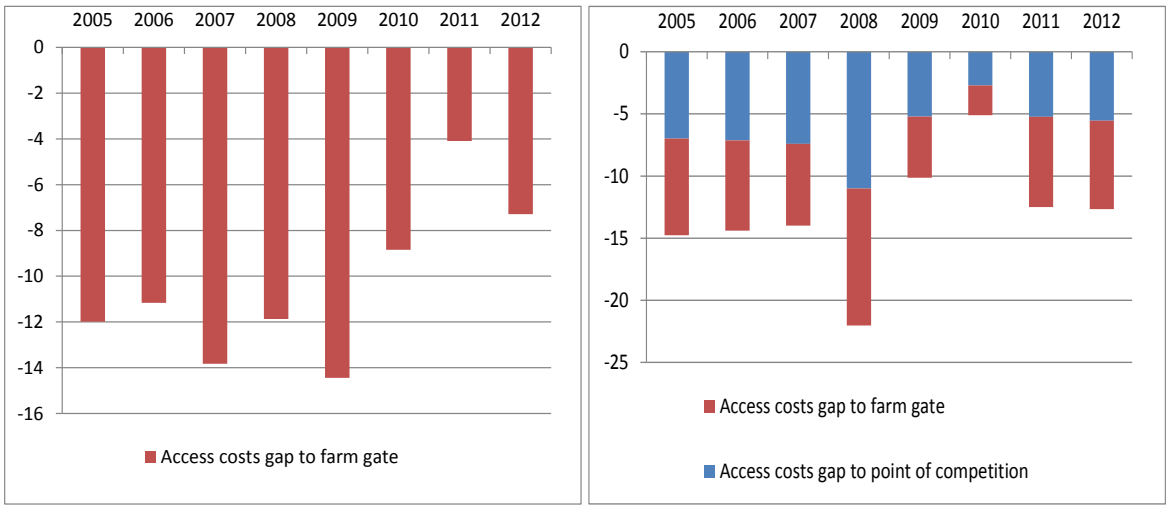
$$\boldsymbol{MDG_{fg}} = \frac{(\boldsymbol{ACG_{wh}+ACG_{fg}})}{\boldsymbol{RP_{fg}}} \qquad 2$$

Where MDG_{fg} is the market development gap at farm-gate, ACG_{wh} is the access costs gap between the border and the wholesale level, ACG_{fg} is the access costs gap between the wholesale and farm-gate level, and RP_{fg} the adjusted reference price at farm gate.

[24] More information about the methodology is available in the MAFAP Methodological paper (MAFAP, 2015), on the MAFAP website.

With regards to the cotton value chains in Mali and Burkina Faso, the MAFAP MDG indicator captures a specific set of inefficiencies. The effect of the removal of bribes along the border to wholesale trade corridor was taken into account for Burkina Faso, and a lower margin from ginning factories was considered. In Mali, certain fees charged by the CMDT to producers' cooperative, which are not associated with the provision of a service, were considered to be inefficiencies and used in the calculation of the MDG (insurance and proportionate share of overhead costs). The MDG was of -10 percent and -13, on average over the 2005-2012 period, for Mali and Burkina Faso, respectively (Figure 6). Concretely, this suggests that producer prices could have been 10 percent and 13 percent higher, in Mali and Burkina Faso respectively, in the absence of these market imperfections. Policies aimed at reducing illicit or inefficient taxations along the value chain could thus contribute to a long-term improvement of producer prices without the need for price-distortive policies, such as the price mechanism of Mali. In 2010, 2011 and 2012, the relative weight of market inefficiencies on producer prices was reduced, given the rise in international and domestic cotton prices (Figure 6).

Figure 6. Market development gaps for cotton in Mali (left) and Burkina Faso (right), as a share of farm-gate reference price, 2005-2012 (percentage)



Source: Authors, based on Gourichon and Koné (2014), and Lanos and Ouedraogo (2014).

Additional inefficiencies exist in Mali's and Burkina Faso's cotton value chain, and were not quantified and integrated in the MAFAP MDG.[25] In terms of production costs, West African cotton is said to compete with the US cotton due to its extremely low cost of labor (Estur, 2005). Nevertheless, yields are low – more than twice lower than Australia's – and even declining in both countries since 2008. This can be attributed to the overuse of low-quality fertilizers, use of cotton fertilizers for other crops, extension of cotton to low-yield areas and decrease in the technical expertise of cotton growers (Gourichon and Koné, 2014). Furthermore, handpicking is still prevalent: although it improves quality, the technique lowers production volumes. Also, producing areas are often located far from the limited number of ginning factories, resulting in towering transport costs. This adds to the overall issue of very high transport costs between ginning factories and trading ports, especially due to the poor quality of roads (Teravaninthorn and Raballand, 2009). The two countries, if they continue to invest on long-term support to the cotton sector, may be able to reduce transport costs and improve productivity in the long run. This could, in turn, result in higher price for producers and diminish the budgetary burden of the current support structure to the cotton value chain.

[25] This is due to the mere lack of quantitative data on production, processing and marketing costs in African countries, and the absence of appropriate counterfactuals to estimate ''efficient costs''.

5. Conclusion

The economies of Burkina Faso and Mali rely on cotton exports. Nonetheless, unfavourable international market conditions, characterised by low prices, threaten the growth and viability of the cotton sector in the two countries. Therefore, to support the cotton value chain, governments of both countries have implemented a price stabilization fund to ensure stable prices to producers, while investing on inputs to boost production. The price policy support resulted in protection for Malian and Burkinabè producers; they received market prices above the international reference prices. Thereby, the price stabilization fund has compensated producers for the international market price distortions that result from the subsidy policies in the main producing countries, as well as the exchange rate misalignment between US dollar and CFA franc. Furthermore, it has offset the cost of market inefficiencies on domestic producer prices for cotton value. Together, the price policy support and the budgetary transfers to the cotton sector resulted in a protection of 54 and 52 percent in Burkina Faso and Mali respectively on average between 2005 and 2012 (nominal rate of assistance). Such policy support to producers comes at a cost for the society, namely 9 and 31 percent of the public expenditures in support to agriculture on average between 2006 and 2012, in Burkina Faso and Mali, respectively. The share of expenditures allocated to the cotton sector is continuously dropping in Burkina Faso, nevertheless, while it has dramatically increased in Mali.

The international market perspectives are ominous for Mali and Burkina Faso, with international prices reverting to pre-2010 level. In that regard, the high opportunity cost of the current policy support to cotton should be considered carefully. Although budgetary transfers aimed at cotton have a spill-over effect on other value chains, their weight on the total agricultural budget hamper the development of other value chains that could be drivers of economic and social development, while being less vulnerable to international market dynamics. This is the case of livestock, horticulture, grains, for instance.

Furthermore, the effectiveness of such a support can be challenged: while it has created price incentives to production, the total output of cottonseed has decreased in Mali until the international price peak of 2010. In Burkina Faso, the output has been uneven. The analysis also shows that investments in hard and soft infrastructures to reduce the market inefficiencies along the value chain would increase price incentives to production for cotton but also for other crops. Continuing investments in cotton productivity should also ensure higher incomes for producers (Baquedano , Sanders & Vitale, 2010), while exploring support towards crop diversification, as a complement of the cotton revenue, should moderate the income decline of producers (Coulibaly *et al.*, 2013).

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