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Evidence on the impact of monopoly maize markets on smallholder farmers in Sub-Saharan Africa

Alexandra Doyle

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This assessment is being carried out by Oxford Policy Management. The project manager is Vinayak Uppal. The remaining team members are Alexandra Doyle. For further information contact Vinayak.Uppal@opml.co.uk.

The contact point for the client is Vinayak Uppal, Vinayak.Uppal@opml.co.uk.

Oxford Policy Management Limited
Registered in England: 3122495

6 St Aldates Courtyard
38 St Aldates
Oxford OX1 1BN
United Kingdom

Tel +44 (0) 1865 207 300
Fax +44 (0) 1865 207 301
Email admin@opml.co.uk
Website www.opml.co.uk

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List of abbreviations

ADMARC	Agricultural Development and Marketing Corporation of Malawi
CV	Coefficient of Variation
FAO	Food and Agricultural Organisation of the United Nations
FRA	Food Reserve Agency
GDP	Gross Domestic Product
IFPRI	International Food Policy Research Institute
NCPB	National Cereals and Produce Board of Kenya
NFRA	National Food Reserves Agency
OPM	Oxford Policy Management
SGR	Strategic Grain Reserve
SSA	Sub-Saharan Africa
VAR	Vector autoregression

1 Introduction

1.1 Smallholder Farming in Sub Saharan Africa

The rural economy of Sub-Saharan Africa (SSA) is dominated by agriculture. In 2005, agriculture employed 62% of the population and generated 27% of the region's GDP[1]. Agricultural production systems in SSA are dominated by smallholder farms[2] with a few large-scale farms also contributing to agricultural output. For these households, agriculture remains the dominant source of income with little opportunity to diversify their source of income away from smallholder agriculture. Not only is agriculture an important source of income for countries in SSA as well as farming households but domestic agriculture is central to ensuring food security within these countries. Hence, incentivising sufficient production of agricultural outputs is an important consideration for many Sub-Saharan African governments (Livingston et al., 2011).

Over the past ten years, there has been increasing intervention into grain markets in Sub-Saharan African countries using strategic reserves and/or market boards. This trend has emerged counter to the process of structural adjustment and liberalisation of agricultural markets seen during the 1990s. The reasons for increased state intervention in agricultural markets, by means of crop marketing boards and strategic food reserves, are to address the key challenges faced by smallholders, namely access to output markets and price stability for producers and consumers (Fung et al., 2015). In order to incentivise smallholders to produce agricultural output, governments believe it is essential to provide farmers with guaranteed markets for their produce at fair farm gate prices to reduce poverty amongst smallholder farmers. Smallholders operating in maize markets face higher risks and lower returns than famers operating in integrated markets such as coffee and cocoa production. Specifically, they do not have guaranteed buyers for their goods and face price uncertainty, both of which state-owned monopoly maize buyers in Sub-Saharan Africa try to address. Despite the resurgence of these marketing boards, there is limited empirical evidence addressing the impact of marketing boards on crop markets and even less on the welfare effects of these policies particularly for smallholders. This paper presents qualitative and quantitative evidence from SSA that addresses the effects of marketing boards and parastatal buyers on maize prices and the distributional effects of maize price changes on smallholder farmers but find that few studies are able to quantify the size of the economic impact of changes in the maize price on smallholders.

1.2 Theoretical Economic Impacts of Monopoly Maize Markets

Parastatal maize buying agencies operate differently across Sub-Saharan African countries and hence the effects of these agencies are heterogeneous and country-specific. In general, there are two aspects to consider when analysing the economic impacts of these buying agencies on smallholders. The first consideration is the impact of the buying agency on the price of maize in the country – does the agency offer pan-territorial prices? Does the agency buy and sell grain at the same price? Does the agency offer higher-than-market prices to smallholders?

The second consideration is the way in which smallholders engage in the maize market. On average, in Sub-Saharan Africa, a small majority of farmers are net sellers of grain, producing and selling more grain than they purchase and consume. However, the majority of smallholders are net buyers of maize and hence the welfare impacts of monopoly maize buyers on this group depends on the agency's impact on the purchase and sale price of maize. Finally, a small group of smallholders produce for subsistence only and hence are autarkic with respect to the maize

[1] These figures exclude South Africa.
[2] Smallholder farms are defined as farms that are 2 ha or less in size (Livingston et al., 2011).

market. Therefore, it is important to consider the impact of changes to the price of maize for each of these groups as considering aggregate welfare impacts will mask the heterogeneous impact across groups of smallholders.

The purpose of this report is to determine the state of the literature, in terms of quantitative and qualitative evidence, regarding the impact of monopoly maize markets on smallholder farmers in Sub-Saharan Africa. The aim of this paper is to determine whether there is rigorous evidence to address this question and to try to identify gaps in the literature rather than to provide a systematic literature review. The rest of this paper is structured as follows: Section 2 outlines the search methodology, Section 3 presents the evidence from different Sub-Saharan African countries and Section 4 concludes by summarising the evidence and outlining some gaps in the literature.

2 Search Methodology

This paper is based on extensive research pertaining to monopsony maize markets and the economic impact of these markets on smallholder farmers. Specifically, this review focuses on the impact of state-owned maize marketing boards and parastatal food agencies and their impact on smallholder maize farmers. The papers used in this report are restricted to papers from countries in Sub-Saharan Africa and focus solely on maize markets rather than other staples or crops. The search was structured around the following key search phrases:

- Monopoly maize markets
- Food Reserve Agency
- Maize marketing boards
- Smallholder maize farmers
- Smallholder livelihoods
- Maize in Sub-Saharan Africa

The appropriate evidence was found by searching relevant databases (such as Taylor and Francis, Science Direct, and IDEAS RePEc), journals (i.e., Agricultural economics, American Journal of Agricultural Economics, World Development etc.), and grey literature including from international organisations, NGOs (e.g. FAO, IFPRI), think tanks and research centres as well as regional groups and donors (e.g., bilateral and multilateral).

The papers in this report were constrained to papers written in the post-liberalisation periods when many state marketing boards were dismantled in line with the policy of structural adjustment.

This report does not constitute a systematic review but is rather a brief literature review intended to indicate the state of academic knowledge with regards to the impact of monopoly maize markets on smallholder farmers in Sub-Saharan Africa. Therefore, although the search used was extensive, this report is not completely exhaustive in terms of drawing on related literature such as other crop markets or other regions.

3 Evidence from Sub Saharan Africa

3.1 Zambia

Zambia has a long history of government intervention into the maize market. Between 1966 and 1984, price controls and subsidies were used to keep producer prices low to provide cheap food to urban consumers. This system, however, discouraged production by maize farmers as they received a low price for their crops compared to border prices (Pletcher, 2000). The government officially ended intervention into the maize market in 1994-95 but subsequently established the Food Reserve Agency (FRA) in 1995 to manage a strategic food reserve thereby ensuring national food security and stabilising crop prices. Furthermore, since 2005, the Agency has explicitly aimed to raise rural incomes and, to this end, the FRA has become the dominant buyer of maize in Zambia purchasing 83% of smallholders' market maize in 2010/11 (Mason and Myers, 2013). The FRA purchases maize at a price above wholesale prices.

Using a vector autoregression (VAR) model, Mason and Myers (2013) use monthly data from July 1996 until December 2008 to estimate the effects of the FRA on maize market prices in production and consumption regions in Zambia. The authors found that mean prices increased between 17-19% during this period which had differentiated welfare effects. Higher maize prices are harmful for net buyers of maize, predominantly urban consumers and 49% of smallholders, but are beneficial for largescale farmers and the 28% of smallholders producing a maize surplus[3]. Furthermore, the maize market is highly concentrated and, amongst the smallholder net sellers of maize, 3-5% of these farmers account for 50% of smallholder marketed maize suggesting that the welfare gains of a higher grain price are predominantly concentrated amongst only a few smallholders who are generally better off in terms of asset ownership. Overall, the authors conclude that higher pan-territorial maize prices in Zambia are regressive. Between July 2003 and December 2008, FRA policies were found to decrease the coefficient of variation (CV) of maize prices by 34-36%. The authors also state that the more stable maize price is unlikely to have substantial welfare effects on poor households while benefiting wealthier producers. For example, Myers (2006) uses simulations to find that a large reduction in food price variability, from a CV of 0.3 to 0, increases the welfare of affluent producers equivalently to nearly 9% of income while this price stabilisation results in equivalent income increases of 2.7% and 1.4% among poor producers and poor consumers, respectively.

Nkonde et al (2011) examine the distributional effects of the Zambian government's maize marketing policies in 2010/11, in the face of a bumper crop, on various stakeholders. In response to the bumper crop, the FRA announced a maize price equivalent to import-parity prices from South Africa, despite being in an export situation given the maize surplus. However, only 36% of all smallholders[4] produced a surplus of maize and were expected to sell maize. Furthermore, 3.3% of total smallholders, usually better capitalised than other smallholders, accounted for 50% of maize sold by small- and medium-scale farmers. Hence, the higher maize price resulted in a transfer of income from rural net buyers and urban purchasers to the minority of surplus-producing farmers.

Similarly, Fung et al. (2015) use a household panel survey spanning the years before and during the FRA's scale-up and, by exploiting household- and district-level differences in maize sales to the FRA, use fixed effects and instrumental variables to uncover unbiased welfare impacts of the FRA. The authors find that the FRA has mixed welfare impacts on smallholder farmers. Corroborating the evidence already presented, they find that smallholders that are net sellers to the FRA directly

[3] According to the Zambian Central Statistical Office and Ministry of Agriculture and Cooperatives, 23% of smallholders neither buy nor sell maize but produce for subsistence (CSO, 2012). These households are not affected by a change in the price of maize.
[4] 45% of maize-growing smallholders produced surplus maize.

benefit from the FRA's policies. However, only a small fraction of smallholders in the sample (10% in 2007/08 and 27% in 2011/12) actually sell to the FRA and these tend to be wealthier smallholders. They also find indirect effects of the FRA such that districts with higher levels of FRA activity have reduced non-maize crop income[5] resulting in higher levels of poverty measured in terms of poverty incidence, gap and severity. Hence, the benefits of the FRA are restricted to those who sell to the agency while those who do not sell to the FRA are likely harmed by its activities.

In summary, there is quantitative evidence that the FRA, a monopsony maize buyer in Zambia, has heterogeneous impacts on the livelihoods of smallholders in Zambia but little evidence quantifying the size of the welfare effects of higher maize prices on smallholders.

3.2 Kenya

Kenyan policy makers face a dilemma in terms of pricing their most important crop, maize. On the one hand, it is important to ensure that farmers are fairly remunerated in order to incentivise production while simultaneously ensuring food security for urban consumers and rural households who are buyers of maize. The National Cereals and Produce Board (NCPB) attempts to balance these needs by procuring and selling maize at administratively determined prices which impact the wholesale market prices of maize (Jayne, Myers and Nyoro, 2006).

The findings in Jayne et al. (2001), using a sample of rural households in 18 Kenyan districts surveyed in 1997 and again in 1998, support the results found in the Zambian context. The impact of maintaining high maize prices, followed by the Kenyan government, had distributional effects on farmers depending on whether they are net buyers, net sellers or autarkic to maize. In this sample, 52% of rural smallholders were net buyers of maize who were directly hurt by higher prices, 32% benefited as net sellers and 16% were autarkic to maize. Similarly to the case of concentrated maize markets in Zambia, 74% of total maize output sold by small-scale farmers was produced by 10% of these farmers. Furthermore, poor households, usually net maize buyers, were disproportionately hurt by high maize prices as net maize purchases as a proportion of total income are relatively higher than for high-income households. The authors corroborate their quantitative findings using a qualitative survey in which 67% of farmers stated that they preferred lower maize prices, a figure in line with the proportion of net buying households.

Jayne et al. (2006) use monthly data from January 1989 to October 2004 to run a VAR model that allows the authors to estimate a counterfactual maize price without the NCPB. The results indicate that the NCPB's administered prices have raised wholesale market prices, on average, but varied substantially during the period of consideration. This represents an income transfer from maize purchasing households to relatively large farmers who account for approximately 50% of Kenya's domestically marketed maize surplus.

Mather and Jayne (2011) use a panel survey from 1997-2007, estimate the impacts of the NCPB on rural net crop income. The results show that the pan-territorial pricing of the NCPB raise farmers' price expectations resulting in increased maize production. While the authors note that a 1% increase in expected maize price increases household total net crop income by 1.9%, they are unable to infer the impact of price increases on household welfare given that most rural Kenyan farmers are net buyers of maize. The authors cite Mghenyi, Myers and Jayne (2011) who find that higher maize prices lead to increased poverty headcounts and lower household income. Specifically, Mghenyi, Myers and Jayne (2011) find that a 25% discrete increase in the maize price, due to the NCPB, is associated with significant welfare losses in regions where smallholders and households are net buyers of the crop. Using a second-order welfare approximation, the

[5] This is because non-maize crop prices were found to fall.

authors find that many rural households are not affected by the price change, while households in major production regions which are able to produce a maize-surplus gain and net-buying households are losers.

In a study aiming to understand the decision by small-scale farmers to be either net buyers or net sellers in the maize market in Kenya, Muricho et al. (2015) use a random effects ordered probit to understand the impact of various factors such as producer price supports and food security policies on this decision. This quantitative evidence from Kenya shows that producer price supports are detrimental to smallholders as it induces them to become net buyers of maize[6] and is also harmful for urban consumers of maize.

A report by the World Bank (2013) notes that the NCPB's activities between 1995 and 2004 increased maize prices by 20% due to the NCPB's largescale operations comprising about 25-35% of maize purchases. In their sample of maize producers, approximately two thirds of smallholders are net buyers who are directly hurt by higher prices. The authors estimate that a 20% drop in the maize price (i.e. no interference in the market by the NCPB) would raise household income by 6%, on average, while the rise in income would be 18% for the poorest quintile in the sample.

As in the case of Zambia, there appears to be evidence that the NCPB exerts upward pressure on maize prices which is harmful to rural smallholders who are predominantly net buyers of maize. Higher maize prices represent an income transfer from poor smallholders to wealthier farmers and therefore has unintended consequences for the government's goal of poverty reduction. This quantitative evidence is corroborated by qualitative evidence comprising farmer interviews stating their preference for lower maize prices. Furthermore, there is quantitative evidence that higher maize prices induce smallholders to become net buyers of maize which has harmful effects for their overall welfare.

3.3 Ethiopia

Bellemare, Barrett and Just (2013) find that food price stabilisation benefits are concentrated in the wealthiest 40% of consumers while rural, poor households are hurt by price stabilisation. Using a panel from rural Ethiopia in 1994, 1995 and 1997, the authors conclude that price stabilisation is in fact a regressive policy and the gains are increasing in household income.

The evidence regarding Ethiopia is scant and only addresses the issue of price stabilisation rather than directly addressing smallholder's welfare.

3.4 Malawi

High levels of poverty and food insecurity have prompted the Malawian government to intervene in the weak domestic maize market. Government interventions include providing farm input subsidies, recommending minimum farm gate prices to incentivise production, supporting a grain marketing board and a national food reserve agency and controlling maize trade to stabilise prices and ensure food security. In Malawi, about 8.5% of farmers are net sellers, 8.9% buy and sell, 55.3% are net maize buyers and the remainder autarkic (Jayne et al., 2010). Overall, only 10% of all maize produced in Malawi is formally traded resulting in weak and thin maize markets. Lack of production for the market is most likely due to the volatility of maize prices in the country and the associated risks faced by smallholder farmers. The government's NFRA buys maize stocks for the Strategic Grain Reserve (SGR) at a pre-determined price. The Agricultural Development and Marketing Corporation (ADMARC) procures maize from smallholders at above-market prices.

[6] The reason for this is not discussed in the paper.

Interviews in Jayne et al. (2010) show that farmers appreciate the role ADMARC plays because they protect smallholders from exploitation by traders and also sell maize to farmers needing to buy maize at lower prices than food traders during times of food scarcity. However, ADMARC is said to frequently run out of funds and is unable to pay farmers promptly during the harvest. Overall, small-scale farmers view the institution as beneficial but are unhappy with the way it is implemented.

There is poor qualitative evidence pertaining to the benefits of ADMARC for small-scale farmers in Malawi. There does not, however, appear to be any quantitative evidence to assess the economic impact of ADMARC and the NFRA on small-scale farmers in Malawi.

3.5 Other evidence from Sub Saharan Africa

Jayne, Mather and Mghenyi (2010) use samples[7] of smallholder farmers in Rwanda, Zambia, Ethiopia, Kenya and Mozambique to understand, among other dynamics, the impact of higher maize prices on smallholder farmers. The authors found that smallholders fell into one of four categories – sellers of grain, buyers of grain, households selling and buying grain in the same year and households that neither buy nor sell grain. Smallholders only selling grain were found to benefit from state intervention by means of marketing boards to support maize prices. On the other hand, the net buyers of maize, about 50-70% of the rural population, are directly hurt by higher grain prices. A small proportion of the rural population, between 5-15%, both buy and sell grain typically distress selling grain after the harvest, and buying back more grain later in the season. This is often harmful for farmers due to the seasonality of the maize price as they sell maize at low prices after the harvest and buy back maize when the price is higher towards the end of the season. Finally, a small proportion of the population is autarkic with respect to grain especially in parts of Mozambique and Zambia where cassava is the main staple. These results, across five Sub-Saharan African countries, corroborate the findings already presented and suggest that policies to alter mean prices can have unanticipated distributional effects on income that may run counter to poverty alleviation goals. Furthermore, the Jayne et al. (2010) find that staple grain sales are concentrated amongst a few wealthier smallholders suggesting gains from higher mean prices are also highly concentrated.

This cross-country evidence supports the results found in Zambia and Kenya, especially, and provides some evidence that these results can be extrapolated to other parts of Sub-Saharan Africa in which there are marketing boards or parastatal maize purchasing agencies. However, cross-country studies may mask heterogeneities between countries and the way in which maize purchasing agencies operate in each country and hence complement rather than substitute country-specific studies.

[7] The following surveys are used in this study: 2001 demographic survey of agricultural households in Rwanda, the 2001 and 2004 Supplementary Surveys combined with the 1999-2000 Post Harvest Survey in Zambia, 1995-96 Annual Agricultural Sample Survey in Ethiopia, 1997 smallholder farm survey covering 1578 small-scale farming households in Kenya, and a sample of 4908 small- and medium-sized farms conducted in 2002 by the Mozambican Ministry of Agriculture and Rural Development.

4 Summary and Conclusions

There has been a resurgence of government sanctioned intervention in maize markets in Sub-Saharan Africa. Governments want to provide their citizens with food security by building food reserves and also reduce poverty amongst rural smallholders by providing them with markets for their produce and fair farm gate prices. However, such policies have welfare and distributional effects which should be considered. The evidence presented in this report indicates that to determine the welfare effects of monopsony maize buyers, it is first important to consider the agency's impact on the price of maize and then to consider the smallholder's role in the grain market. The results tend to indicate that marketing boards and food reserve agencies offer support to maize prices and are able to offer smallholders prices above the wholesale price for their produce. However, given that the majority of smallholders in SSA tend to be net maize buyers, higher maize prices may have unintended consequences thereby reducing smallholders' overall income and welfare. Furthermore, it appears that the output produced by the smallholders who are net maize sellers is produced by a small number of farmers and hence the benefits of higher maize prices are concentrated amongst a handful of households. Therefore, on aggregate, monopsony maize purchases exerting upward pressure on the maize price may in fact have welfare reducing effects, on aggregate. Finally, it is important to consider the indirect impacts of maize price supports. There is some evidence, from Zambia in particular, that activities by state maize purchasers may reduce overall welfare in a given district due to the effects on non-maize prices and hence overall household income.

Overall, there is some evidence to answer the question of the impact of monopoly maize markets on smallholder maize farmers in Sub-Saharan Africa. In the cases of Zambia and Kenya, in particular, there is evidence that smallholders are hurt by higher maize prices as they are net maize buyers and that the benefits of higher maize prices, for net sellers, are concentrated amongst a few relatively wealthier smallholders. However, there is only limited evidence from Kenya to address the size of the economic impact on smallholders' incomes, assets or economic welfare. There are few papers addressing this issue in other Sub-Saharan African countries and the evidence in these countries is scant. Furthermore, it is important to consider the impact of the higher maize price on other staples and the impact of this on smallholders' welfare.

Table 1: Summary of the Evidence

Papers Considered					
Author(s)	**Year**	**Country**	**Qualitative or Quantitative?**	**Size of Economic Effect**	**Economic Impact**
Mason and Myers	2013	Zambia	Quantitative	Unknown	Heterogeneous impact of high prices depending on whether farmers are net buyers, net sellers or autarkic
Myers	2006	Zambia	Quantitative (simulation)	Increases in equivalent income of 9% for wealthy producers and 2.7% for poor producers	Stable maize prices are more beneficial for wealthy producers
Nkonde, Mason and Sitko	2011	Zambia	Quantitative	Unknown	Heterogeneous impact of high prices depending on whether farmers are net buyers, net sellers or autarkic
Fung, Liverpool-Tasie, Mason and Oyelere	2015	Zambia	Quantitative	Unknown	Heterogeneous direct impact of higher prices depending on whether farmers are net buyers, net sellers or autarkic combined with higher poverty levels in districts in which the government intervenes (indirect impact)
Jayne, Yamano, Nyoro and Awuor	2001	Kenya	Quantitative and Qualitative	Unknown	Heterogeneous impact of high prices depending on whether farmers are net buyers, net sellers or autarkic; Farmers have a stated preference for lower prices
Jayne, Myers and Nyoro	2006	Kenya	Quantitative	Unknown	Higher prices resulted in an income transfer from maize purchasing households to relatively large farmers
Mather and Jayne	2011	Kenya	Quantitative	Crop income raised by 1.9%	Higher prices raise household total net crop income; No consideration of effects for maize buyers
Mghenyi, Myers and Jayne	2011	Kenya	Quantitative	Unknown	Heterogeneous impact of high prices depending on whether farmers are net buyers, net sellers or autarkic
World Bank	2009	Kenya	Quantitative	A 20% decrease in the maize price would increase household income by 6%.	Heterogeneous impact of high prices depending on whether farmers are net buyers, net sellers or autarkic
Muricho, Kassie and Obare	2015	Kenya	Quantitative	Unknown	Producer price supports are detrimental to smallholders and urban consumers as they are both net buyers of maize

Bellemare, Barrett and Just	2013	Ethiopia	Quantitative	Unknown	Food price stability benefits wealthy consumers and hurts the rural poor (including smallholders)
Jayne, Sitko, Ricker-Gilbert and Mangisoni	2010	Malawi	Qualitative	Unknown	Farmers are able to sell maize at high prices and purchase maize at lower prices which smallholders stated they like
Jayne, Mather and Mghenyi	2010	Rwanda, Zambia, Ethiopia, Kenya and Mozambique	Quantitative	Unknown	Heterogeneous impact of high prices depending on whether farmers are net buyers, net sellers or autarkic

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Annex A Annotated Bibliography

Bellemare, M. F., Barrett, C. B., & Just, D. R. (2013). The Welfare Impacts of Commodity Price Volatility: Evidence from Rural Ethiopia. *American Journal of Agricultural Economics*, 28(4), 379–404.

URL: http://ajae.oxfordjournals.org/content/early/2013/07/04/ajae.aat018.abstract

Abstract:

How does commodity price volatility affect the welfare of rural households in developing countries, for whom hedging and consumption smoothing are often difficult? When governments choose to intervene in order to stabilize commodity prices, as they often do, who gains the most? This article develops an analytical framework and an empirical strategy to answer those questions, along with illustrative empirical results based on panel data from rural Ethiopian households. Contrary to conventional wisdom, we find that the welfare gains from eliminating price volatility are increasing in household income, making food price stabilization a distributionally regressive policy in this context.

Central Statistics Office (CSO). (2008). *Living Conditions Monitoring Survey 2006 Draft* Report [Government of Zambia].

URL: http://www.zamstats.gov.zm/report/Lcms/2006-2010%20LCMS%20Report%20Final%20Output.pdf

Abstract:

Not Available.

Fung, W., Liverpool-Tasie, S., Mason, N., & Oyelere, R. U. (2015*). Can Crop Purchase Programs Reduce Poverty and Improve Welfare in Rural Communities? Evidence from the Food Reserve Agency in Zambia*. In 2015 Conference, August 9-14, 2015, Milan, Italy. International Association of Agricultural Economists.

URL: http://ftp.iza.org/dp9361.pdf

Abstract:

The last decade has seen a resurgence of parastatal crop marketing institutions in sub-Saharan Africa, many of which cite improving food security and incomes as key goals. However, there is limited empirical evidence on the welfare effects of these programs. This article considers one such program, the Zambian Food Reserve Agency (FRA), which purchases maize from smallholder farmers at a pan-territorial price that typically exceeds maize market prices in surplus production areas. Using both fixed effects and an instrumental variables approach combined with correlated random effects, we estimate the effects of the FRA's maize marketing activities on smallholder farm household welfare. Results suggest that FRA activities have positive direct welfare effects on the small minority of smallholder households that are able to sell to it. However, the results also suggest negative indirect FRA effects, as higher levels of FRA activity in a district are associated with higher levels of poverty.

Jayne, T. S., Mather, D., & Mghenyi, E. (2010). Principal Challenges Confronting Smallholder Agriculture in Sub-Saharan Africa. *World Development*, 38(10), 1384–1398.

URL: http://www.sciencedirect.com/science/article/pii/S0305750X10001014

Abstract:

This paper uses small-scale farm survey data from five countries of eastern and southern Africa to highlight four under-appreciated issues: (i) how land distribution patterns constrain the potential of crop technology and input intensification to enable many small farms to escape from poverty; (ii) why most smallholders are unable to produce more than a marginal surplus or participate meaningfully in commodity markets; (iii) why most farmers are directly hurt by higher grain prices; and (iv) why the marketed agricultural surplus is exceedingly concentrated among a small group of relatively large smallholders. Policy and public investment options are reviewed in the light of these findings. There is no one future for small farms in Africa: much depends on government policy and investment decisions.

Jayne, T. S., Myers, R. J., & Nyoro, J. (2008). The effects of NCPB marketing policies on maize market prices in Kenya. *Agricultural Economics*, 38(3), 313–325.

URL: http://onlinelibrary.wiley.com/doi/10.1111/j.1574-0862.2008.00302.x/abstract

Abstract:

The Government of Kenya pursues maize marketing policy objectives through the National Cereals and Produce Board (NCPB), which procures and sells maize at administratively determined prices, and stores maize as a contingency against future shortages. A private sector marketing channel competes with the NCPB. This article estimates the effects of NCPB activities on the historical path of private sector prices in Kenyan maize markets between 1989 and 2004. The analysis is carried out using a reduced form vector autoregression model (VAR) estimated with sparse data and imposing only minimal identification restrictions. Results show that NCPB activities have stabilized maize market prices in Kenya, reduced price levels in the early 1990s, and raised average price levels by roughly 20% between 1995 and 2004. Over the past decade, the price-raising activities of the NCPB have transferred income from urban consumers and a majority of small-scale farm households that are net buyers of maize to a relatively small number of large- and small-scale farmers who are sellers of maize.

Jayne, T. S., Myers, R., & Nyoro, J. (2006). *The Effects of Government Maize Marketing Policies on Maize Market Prices in Kenya*. In Contributed paper, International Association of Agricultural Economics Tri-Annual Meetings, Gold Coast, Australia.

URL: http://ageconsearch.umn.edu/bitstream/25555/1/cp060346.pdf

Abstract:

Not Available

Jayne, T. S., Sitko, N., Ricker-Gilbert, J., Mangisoni, J., & others. (2010). *Malawi's maize marketing system.* Report Commissioned by the World Bank and Government of Malawi/Ministry of Agriculture, Lilongwe.

URL: http://fsg.afre.msu.edu/malawi/Malawi_maize_markets_Report_to-DFID-SOAS.pdf

Abstract:

Not Available.

Jayne, T. S., Yamano, T., Nyoro, J., Awuor, T., & others. (2001). *Do farmers really benefit from high food prices? Balancing Rural Interests in Kenya's Maize Pricing and Marketing Policy.* Tegemeo Institute for Agricultural Policy and Development Working Paper B, 2.

URL: http://www.fsg.afre.msu.edu/kenya/wp2b.pdf

Abstract:

Not Available.

Livingston, G., Schonberger, S., & Delaney, S. (2011). *Sub-Saharan Africa: The state of smallholders in agriculture.* Presented at the Conference on New Directions for Smallholder Agriculture, Rome: IFAD.

URL: http://www.ifad.org/events/agriculture/doc/papers/livingston.pdf

Abstract:

This paper provides an overview of agricultural and economic characteristics of sub-Saharan Africa (SSA), in comparison with other developing regions and the opportunities which the medium-term outlook holds for SSA's small holder farmers. Seizing these opportunities will depend on shifting from extensive to intensive production systems. The paper reiterates a key conclusion of IFAD's 2011 Rural Poverty Report: the ability of SSA's smallholder farmers to increase on-farm investments in productivity is constrained by their capacity to manage the risk-return trade-offs in moving towards intensified agriculture. Risks are often specific to different types of supply chains. Generally speaking, smallholders in disbursed supply chains (cereals, rice) are exposed to a larger number of business risks and lower returns than those operating in integrated markets (fair trade cocoa, specialty coffee) where risks are more widely shared among supply chain actors. While there remains a need for more rigorous evaluation of the relative impacts on livelihoods of participating farmers, experience under IFAD financed projects which aim to move farmers towards greater market integration has generally confirmed significant, positive impacts on both the level and stability of incomes of participating smallholders. However, evidence on the ground is highlighting that these investments, of themselves, are not sufficient in most cases for farmers to move effectively from a dependence on dispersed staple crop markets towards more integrated market opportunities. While there are a myriad of explanations offered, most emphasizing the weakness of institutions or governance, we suggest that a more focused and practical element merits greater attention: effective coordination of project interventions in terms of place and timing of development support.

Mason, N. M., & Myers, R. J. (2013). The effects of the Food Reserve Agency on maize market prices in Zambia. *Agricultural Economics*, 44(2), 203–216.

URL: http://onlinelibrary.wiley.com/doi/10.1111/agec.12004/abstract

Abstract:

Over the last decade, governments throughout eastern and southern Africa have increasingly used strategic reserves and/or marketing boards to influence grain market outcomes, yet little is known about how these activities are affecting grain markets. This article estimates the effects of the Food Reserve Agency (FRA) on maize market prices in production and consumption regions in Zambia using a vector autoregression model and monthly data from July 1996 through December 2008. In recent years, FRA has become the dominant buyer of smallholder maize in Zambia. Simulations show that FRA activities stabilized market prices throughout the July 1996–December 2008 study

period and raised mean prices between July 2003 and December 2008 by 17–19%. The price raising effects of FRA policies have assisted surplus maize producers but adversely affected net buyers of maize in Zambia, namely urban consumers and the majority of the rural poor. The increase in maize price stability is unlikely to have had substantial welfare effects on poor households. In contrast, relatively wealthy producers are likely to have benefited from the higher average and more stable maize prices resulting from FRA policies.

Mather, D., & Jayne, T. S. (2011). The Impact of State Marketing Board Operations on Smallholder Behaviour and Incomes: The Case of Kenya. MSU International Development Working Paper, 11.

URL: http://ageconsearch.umn.edu/bitstream/120742/2/idwp119.pdf

Abstract:

Despite the resurgence of parastatal marketing boards and strategic grain reserves over the last decade in eastern and southern Africa, there is little empirical evidence about how their activities affect smallholder input use and cropping decisions. This paper uses panel survey data from 1997-2007 on Kenyan smallholders to investigate the effect of Kenya's National Cereal Produce Board (NCPB) activities on farm-gate maize price expectations, output supply, and factor demand.

Results show that the NCPB pan-territorial maize purchase price has a strong, positive effect on smallholders' maize price expectations, and that smallholders respond to higher expected maize prices by increasing maize production via intensification – through increased fertilizer use as well as higher maize seeding rates within intercrops. Specifically, we find that a 10% increase in the NCPB purchase leads to: a 1.4% increase in the expected farm-gate maize sale price; a 2.5% increase in household maize production; a 0.6% increase in the probability of fertilizer use on maize; increases of 1.4% and 2.9% in conditional and unconditional quantities of fertilizer applied to maize; and a 2.6% increase in household total net crop income, on average. Increases in maize production do not appear to be coming at the expense of production of other crops, as we find no evidence to suggest that higher expected maize prices lead to reductions in either area planted to non-maize crops or non-maize crop production.

We also find that a 1% increase in the expected maize price increases total household net crop income by 1.9%. However, our ability to infer changes in the welfare of rural households from changes in total net crop income is limited, as this variable only measures the total value of crops produced by a rural household – not household total income, which also includes income from livestock and non-farm activities. More importantly, for the majority of rural Kenyan smallholders that are net buyers of maize, higher household farm income may not translate into higher expenditure (i.e., welfare) if the costs of meeting the household's food consumption needs are also higher. A study that takes this into consideration found that higher maize prices (due to NCPB price support policies) lead to increased poverty headcounts and/or lower household income in every region except for the high potential zone (Mghenyi, Myers, and Jayne 2011).

This study has shown that, at least in the case of Kenya, the NCPB is largely achieving its narrowly defined mandate, i.e., increasing maize prices and maize production, as well as contributing in a small way to overall agricultural growth. Thus, our findings corroborate the widely held view in Kenya that the NCPB is a powerful tool for supporting maize production specifically, and Kenyan agriculture more generally. The NCPB's activities have also been found to have a generally stabilizing effect on maize market prices in Kenya (Jayne, Myers, and Nyoro 2008). However, these benefits are being achieved at a cost that is unknown to the general public. Unfortunately, little analysis is available to assess the opportunity costs of

NCPB operations and the potential impacts that could have been achieved had decades of NCPB expenditures been reallocated, partially or fully, to alternative public investments. Such analysis is impeded by restricted access to data on NCPB operating costs. Should such data become publically available, an important question for further research would be to assess the social benefits of NCPB activities in relation to their costs. It will be important for further research to be able to assess whether other marketing boards in the region are having similar effects, given major cross-country variations in their objectives and operations, as well as a better notion of the benefits relative to their costs.

Mghenyi, E., Myers, R. J., & Jayne, T. S. (2011). The effects of a large discrete maize price increase on the distribution of household welfare and poverty in rural Kenya. *Agricultural Economics*, 42(3), 343–356.

URL: http://onlinelibrary.wiley.com/doi/10.1111/j.1574-0862.2010.00518.x/abstract

Abstract:

This study estimates the effects of a large discrete maize price increase on the welfare of a sample of rural Kenyan households. The usual first-order welfare approximation formula is extended to a second-order formula that allows for supply and demand responses to the price change. Results show that many rural households are not affected greatly by the price change, and there are about as many gainers as losers. However, these full sample results mask important differences across regions. Welfare gains generally take place in major production areas while losses are in areas where most households are net buyers of maize. Semiparametric methods are used to investigate the relationship between income and the size of the welfare effect, and poverty dominance techniques are applied to study the impacts of the maize price increase on rural poverty.

Muricho, G., Kassie, M., & Obare, G. (2015). *Determinants of Market Participation Regimes among Smallholder Maize Producers in Kenya*. Adoption Pathways project discussion paper 12.

URL:
http://aciar.gov.au/aifsc/sites/default/files/docs/determinants_of_market_participation_regimes.pdf

Abstract:

More studies have been conducted on determinants of smallholder participation in markets as sellers, with scant attention to why farmers participate in markets as either net sellers, autarkic or net buyers. Employing a random effect ordered probit model, this paper examines factors determining households' participation in maize markets as either net sellers, autarkic or net buyers. Contrary to government intentions for producer price supports, this study showed that households that faced high producer selling prices of maize were likely to be net buyers. However, household membership to agricultural production groups increased the likelihood of farmers being net sellers. Similarly, adoption of inorganic fertilizer and improved maize varieties were positively associated with being net sellers. Therefore, policies supporting high producer selling prices should be discouraged and instead encourage those that ease smallholder access to fertilizer and improved maize seed.

Myers, R. J. (2006). On the costs of food price fluctuations in low-income countries. *Food Policy*, 31(4), 288–301.

URL: http://www.sciencedirect.com/science/article/pii/S0306919206000364

Abstract:

Conventional welfare measures of the costs of food price fluctuations in low-income countries are extended to allow for both economic growth and food security effects. The analysis reveals that growth and food security effects may dominate more conventional welfare costs of food price fluctuations, although estimating the empirical magnitude of the effects is hampered by the lack of consensus on the extent to which food price fluctuations actually reduce economic growth and food security. Even if the welfare costs of food price fluctuations are high there are many challenges to the design and successful implementation of price stabilization schemes.

Nkonde, C., Mason, N. M., & Sitko, N. J. (2011). *Who Gained and Who Lost from Zambia's 2010 Maize Marketing Policies.*

URL: http://saipar.org:8080/eprc/handle/123456789/211

Abstract:

This paper examines the key features of the 2010/11 GRZ maize marketing policies and their income distributional effects on various stakeholder groups. Findings: First, the FRA announced a price of K65, 000 per 50kg bag on May 1, 2010 which was equal to import parity after adding own market price and costs. Second, FRA set purchase targets that were progressively increased during the course of the season as it became clear that FRA‟s original purchase targets would not be sufficient to absorb the majority of the marketed surplus and therefore would do little to lift maize market prices. Moreover, much of the FRA‟s maize is at risk of spoilage due to inadequate access to storage facilities and poor prospects of offloading Zambian maize on regional export markets. Second, despite the record maize harvest, the majority of Zambian smallholders did not produce a maize surplus in 2010. Third, because the FRA set its maize buying price at import parity, millers could obtain maize more cheaply from South Africa than from the FRA unless it relied on the Zambian Treasury to subsidize the FRA's sale price. Key elements of the proposed alternative policies are: (i) FRA maize purchases and sales triggered when market prices fall below and rise above pre-established floor and ceiling prices, respectively; (ii) consistent government policies with respect to private sector exports (e.g., by setting and respecting an export quota); and (iii) other strategies to create a more enabling environment and build capacity for private sector participation in exports.

Pletcher, J. (2000). The Politics of Liberalizing Zambia's Maize Markets. *World Development*, 28(1), 129–142.

URL: http://www.sciencedirect.com/science/article/pii/S0305750X99001205

Abstract:

This paper discusses the process of agricultural liberalization in Zambia. The central argument is that maize markets have been more quickly and fully liberalized than maize input markets because the perceived political risks of liberalizing input markets are greater than those of liberalizing maize markets, and because economic interest groups benefited from maize liberalization while similar interests benefited from continued government interventions in input markets. These finding imply that in order to understand the prospects for economic liberalization in new democracies we must disaggregate both civil society and markets.

World Bank. (2009). Eastern Africa: a study of the regional maize market and marketing costs. Final Report.

URL:
https://openknowledge.worldbank.org/bitstream/handle/10986/3155/498310REPLACEM11Grain1Trade1printed.pdf?sequence=1&isAllowed=y

Abstract:

Not Available.