Is a public regulation of food price volatility feasible in Africa? An arch approach in Kenya

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Abstract

The 2007-2008 food crisis and current food price swings led economists to re-evaluate the potential for policy instruments to manage food price volatility. Many developing countries recently pursued price regulation policies, but the difficulties of these policies in promoting price stability is not fully understood. In particular, the ability of a stabilization policy to lower food price volatility does not depend on the nature of the policy instrument only, but also on the institutional conditions of its implementation. Kenya is a particularly interesting case as it is characterized by a rather long tradition of public intervention, and by the persistence of highly volatile prices. The consistency of the policy use appears to be key factor influencing the degree of price volatility. Applied to trade policies, this consistency is defined by the temporal relationship between the tariff level and the international price changes. To test the influence of policy consistency on price volatility, we develop an autoregressive conditionally heteroskedastic model of price determination in which prices and prices volatility are jointly estimated, using monthly data over the 1994-2009 period in Kenya.

Key words: volatility, predictability, consistency, food, policy, Kenya
JEL: D84, Q13, Q18

1. The regulation of food markets in developing countries (introduction)

The 2007-2008 sharp rises in food prices and the food crisis that followed in developing countries brought food price volatility to the heart of political debates. Food price volatility can have negative

effects both on consumers and producers (Byerlee, Jayne et al. 2006)[1], and there are probably more voices in favor of state management of price volatility than before 2007.

A new stage for stabilization policies in developing countries

In the context of food crises, and despite unresolved debates on the respective roles that the states and the private sector should play in mitigating price instability (Abbott 2010), several developing countries' governments have reinforced their intervention in their food markets, through tighter control of trade and marketing functions (Demeke, Pangrazio et al. 2008). The food crisis provided an invigorated rationale for stabilization policies in developing countries. Many policies have been pursued, such as trade policies (changes in import tariffs and fees, restriction and prohibition of exports) and marketing policies (reduction of taxes, release of public stocks, and price controls). Some of these policies aimed at lowering food price volatility have been accompanied by policies aimed at lowering the negative effects of food price volatility (safety nets).

The regulation of food price volatility: the feasibility debate

Despite the existence of a consensus on the adverse effects of instability, the way to manage food price volatility and the role of regulatory institutions are issues that have long divided economists. To reduce food price volatility, the question whether we should primarily rely on markets[2] or whether markets require a direct public intervention (like public storage policy) is a longstanding debate. Beyond this 'first best policy' debate stands another debate, on the 'feasibility' of such a policy (Poulton, Kydd et al. 2006). Indeed, many countries did intervene in the regulation of their food markets, and many still do. Some have managed to achieve an effective price stability and some have not. The question unsolved is whether those who have not achieved stabilization used inappropriate instruments or whether they used appropriate instruments in an inadequate manner. This observation is the starting point of our paper that analyzes the pragmatic conditions for success of such a public intervention.

Inefficiencies may arise

A literature review of 14 different developing countries brought to light that, under certain circumstances, policies as implemented could fail to lower food price volatility or even increase it (Gérard, Alpha et al. 2010). This paper addresses the ability of stabilization policies to effectively lower food price volatility in Africa, considering that policies should not necessarily produce a constant price but a pattern of prices that either stabilizes and/or adds predictability to the market. In other words, an efficient stabilization policy lowers the unpredictable part of price variations. We want to test here the assumption that for a policy to be effectively able to remove price unpredictability, it

[1] These negative effects are likely to be more important in African countries, where markets are spatially segmented and where food expenditures account for most of household expenditures.

[2] In this case, the State role would be limited to the promotion of a regulatory framework and to investments in public goods.

must be temporally consistent, *i.e.,* the policy level must be appropriate to the price stabilization at each period of time. For instance, a tariff policy is not consistent *per se* in the objective of price stabilization. It is consistent if its level varies adequately with the objective of domestic price stabilization (a proportionate increase when world prices lower and a proportionate decrease when world price increases). To test the effect of policy consistency on the improvement of price predictability, we build an ARCH model adapted from Barrett (1997), where we introduce policy consistency as explanatory variables of price level and of price conditional variance.

The rest of the paper is organized as follows. In section 2, we present a literature review on the influence of pursued domestic policies on food price volatility. In section 3, we present the Kenyan case study and describe the ARCH model and the data used to test this model. In section 4, we present the results. A discussion follows on the policy recommendations that can be derived from these results.

2. The effects of State-led regulation on food price volatility (literature review)

Agricultural and food policies are among the many factors[3] that are likely to influence food price volatility (Abbott 2010; Gilbert and Morgan 2010; Roache 2010), but there is no consensus in the economic literature on the impact of policies pursued at national level on domestic food price volatility.

Price volatility definition and measure

The Organization for Economic Cooperation and Development defines price volatility as "*variations of such a frequency and scale that instead of constituting market signals to agents, they exceed agents' capacity to adapt*".

A common indicator to measure price variations is the coefficient of variation, which corresponds to the unconditional variance. However, agents' capacity to adapt to price depends on their capacity to predict prices. Indeed, some part of price variations is predictable (for example, seasonal price variations), and necessary for the functioning of markets. To take into account these predictable factors, conditional variance indicators have been developed (price forecast models). In this paper, we define price volatility as the unanticipated component of price instability, *i.e.,* the conditional variance, while instability could be defined as the unconditional variance in food prices over a time period, as summarized in table 1 (Chapoto and Jayne, 2009)[4].

Table1. Food price instability vs. food price volatility

[3] Some of these factors enter our model (see section3, presentation of the data used)

[4] Researchers have often resorted to compare price coefficient of variation across different periods characterized by varying policy regimes, but in our literature review we will only consider analyses that have been made with conditional estimates of price sensitivity.

	Definition	Measure
Instability	Unconditional variance (predictable and unpredictable components of price variations)	Coefficient of variation
Volatility	Conditional variance (unpredictable component of price variation)	ARCH models (squared forecast error)

The effect of economic reforms on food price volatility

Most of the analysis on food price volatility deal with international markets, and as a result relatively little information is available on domestic markets. However, domestic food prices can differ substantially from international prices because of localized production shocks, transport and transaction costs, and because of the insulating effect of trade and marketing policies. So far, the literature has not reached a consensus on the effects of policy on food price volatility. Over the past twenty years, several authors have considered the relationship between agricultural liberalization reforms and food price volatility, with different results. We build our model upon the seminal empirical works of Barrett and Shively in the late nineties, which have been considering the effect of liberalization policies on food price volatility (Shively 1996, Barrett 1997). Some empirical findings indicate that liberalization has caused an increase in cereals price volatility (Barrett 1997; Yang, Haigh et al. 2001), while other findings stand that market-oriented measures tend to reduce cereals price volatility (Crain and Lee 1996; Shively 1996). Now, considering the recent renewal of policies to deal with food price volatility in the context of food crisis, we didn't find studies addressing their effect. This could be related to a short delay between food crisis, policy responses and the present time. This paper is motivated by the absence of any clear relationship between the recent renewal of public intervention to cope with food price volatility and the evolution of food price distributions in developing countries.

Low policy consistency may entail policy ability to lower food price volatility

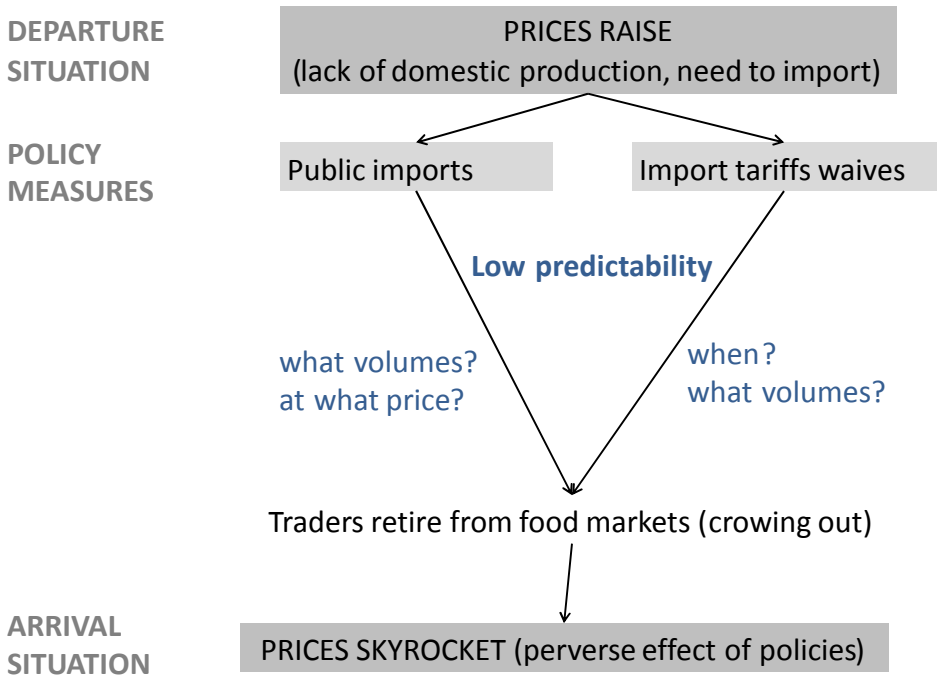
A growing literature on price stabilization policies deals with the concrete mechanisms through which policies are implemented. Part of this literature points out that the capacity of public intervention to regulate food price volatility may be entailed by governance problems (Poulton, Kydd et al. 2006), governance failures (Jayne and Tschirley 2009) or coordination failures (Dorward, Kydd et al. 2005). Seminal empirical studies have demonstrated that, in a context of prices leap, a public intervention aimed at containing the price surge could indeed result in having no effect on it (Galtier 2010), or worse, in an aggravation of it (Nijhoff, Jayne et al. 2002; Mwanaumo, Jayne et al. 2005; Chapoto and Jayne 2009). These inefficiencies can be due to:

- A lack of policy enforcement. It has been highlighted that, in some cases, government could announce a food stabilization policy but fail to effectively implement it, because of (i) deficient enforcement control and/or (ii) low financial capacities. Examples from Western Africa are given below. These low effectiveness problems are more likely to occur in low income countries because of reduced financial means allocated to regulation policies and dependence from international donors, and in landlocked countries because of practical difficulties to control borders. On the contrary, countries with specific financial means (as it is the case in Zambia with copper revenues) and island countries or countries presenting relatively few land frontiers are less exposed to the mentioned problems of deficient enforcement control and low financial capacities. The problem of low financial capacities is crucial in the case of public stockholding that requires important specific funds to effectively lower food price spikes. In the case of Mali, the government implemented a buffer stock in 2004, called the Stock d'Intervention de l'Etat, but because of deficient financial resources, this stock was too narrow to effectively lower food price raises in 2005 and 2008. The problem of deficient enforcement control is crucial both in the case of trade control and marketing policies. In the case of Mali, the government implemented export restrictions in 2008, but this measure did not succeed in containing price raises as it was impossible for the state to physically control the frontiers (illegal exports occurred). This problem of deficient control has been mentioned for marketing policies as well, as in the example of Zambia in 2001 where consumer subsidies, allocated to specific millers, were not passed through to consumers.

- (ii) A lack of policy predictability. When governments intervene in a discretionary and unpredictable way, the private sector cannot correctly anticipate government actions and may decide not to operate in food markets (crowing out effect). The behavioral interactions between the state and private sector in an environment of policy uncertainty has the potential to exacerbate price instability by leading to actions (or inaction) by one set of market actors that was not anticipated by the other (Byerlee, Jayne et al. 2006; Jayne and Tschirley 2009). In such a situation, public intervention may produce unanticipated consequences, such as crowding out private trade or imports that otherwise might have occurred, or were indeed expected by the government. Many examples from Eastern Africa countries are given in the Food Security Research Project.

This is summarized in figure 1.

Figure 1. Policy predictability: The examples of Zambia (2001,2002), Malawi (2005) and Kenya (2008)



These analyses, applied to prices stabilization policies, are consistent with more general analyses on governance forms that prevail in the elaboration and implementation of policies and that insist on the capacity of diverse players (government, private actors) to satisfy their objectives (Kaufmann, Kraay et al. 2010). The World Bank has developed governance indicators to evaluate *the capacity of the government to effectively formulate and implement sound policies* (Kaufmann, Kraay et al. 2010, p4). Somewhat summarized, these works suggest that *the precise policies may be less important than the fact that they exist and that main stakeholders find them credible* (Tschirley and Jayne 2010).

The other dimension we want to explore in this line is the temporal consistency in the use of the policy that makes prices more or less predictable. For instance, a tariff policy can increase or decrease domestic price volatility depending on the institutional capacity to ensure a counter cycling phasing of the tariff.

3. The regulation of maize market in Kenya (model and data)

Our aim is to test the influence of the recent renewal of public intervention on the distribution of food prices, focusing on the effectiveness and predictability of this intervention. The case of Kenya is particularly interesting as it is characterized by a long tradition of public intervention to regulate maize prices and still by the persistence of highly volatile maize prices. In the recent years, and especially starting from 2008, the country has been facing severe food insecurity problems.

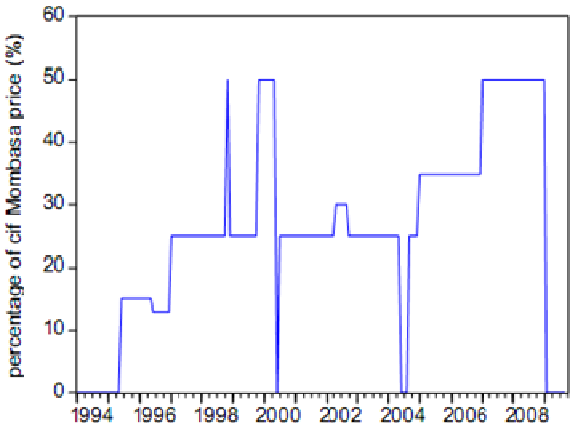
Maize trade and marketing policies pursued in Kenya

Maize prices are a crucial social and political issue in Kenya, maize being the main staple food, accounting for 36% of total food caloric intake in the country (Ariga, Jayne et al. 2010). Besides being the main staple food, maize is also the most common crop grown by rural poor households (Nyoro, Kiiru et al. 1999). The Kenyan government has been intervening extensively in maize markets through trade and marketing policies, even during the so-called liberalization period, and has reinforced its intervention in the last ten years.

Trade policies

Except in good harvest years, Kenya requires substantial maize imports. These imports, mainly coming from Uganda and Tanzania accounted for more than 10% of domestic consumption in the last ten years (WorldBank 2009). Government imposed tariffs on maize imports from 1994, but these tariffs have fluctuated since then, as it is represented in Figure 2. Imports from countries that are not part of either the East African Community or the Common Market for Eastern and Southern Africa are typically taxed at the rate of 50%, but this tariff can be waived and re-imposed without prior notification and is a source of major uncertainty for market participants. If the tariff rate is waived unexpectedly, local prices could quickly become higher than the cost of importing. While the tariff waiver normally triggers imports by the private sector, it can take many months before sufficient volumes are able to be move through a port and transport system with constrained supply capacities to push local prices back down to import parity (Jayne and Tschirley 2009). In addition to these tariffs, numerous non-tariff barriers to regional trade remain, as food quality and safety standard certificates (Ariga, Jayne et al. 2010).

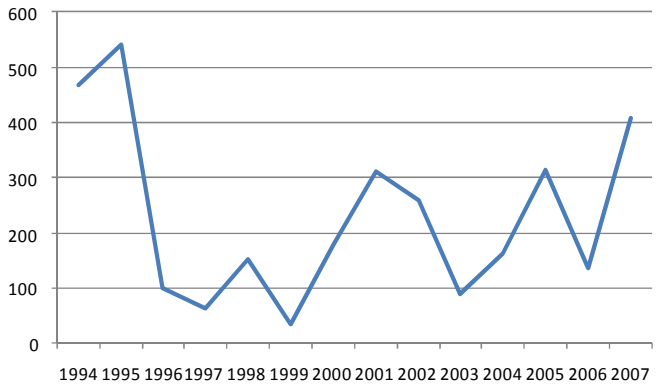
Figure 2. Maize import tariffs at Mombasa Port (from Kenyan Ministry of Trade and industry)



Marketing policies

The National Cereals and Produce Board (NCPB) was created in 1979, to regulate maize markets through the administration of prices, the purchase of domestic maize production and the management of a public buffer stock. With the liberalization reform, between 1995 and 2000, the NCPB scaled back its purchases, providing greater scope for the private sector to operate. However, since 2000, the government has gradually increased NCPB's purchases, as shown in figure 3 (Ariga, Jayne et al. 2010). The NCPB remains a dominant player in the maize market, purchasing in normal or good years around 25-35% of the total domestically marketed maize, most of all from large scale farmers (Jayne, Yamano et al. 2001).

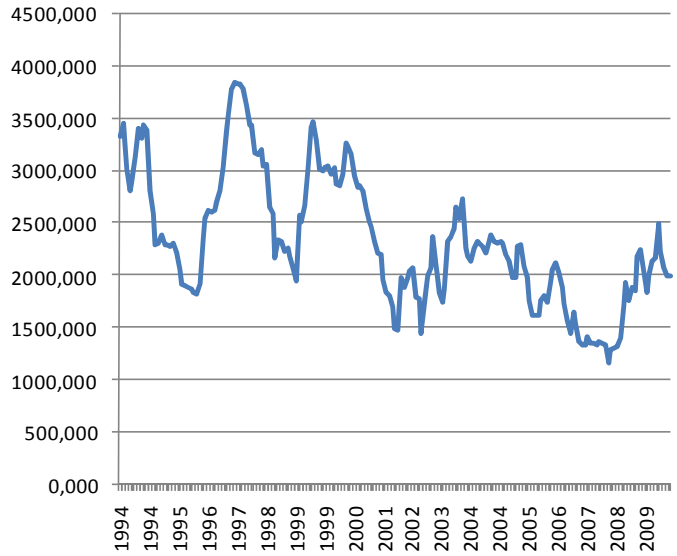
Figure 3. NCPB maize purchases (MT) (from (Ariga, Jayne et al. 2010))



The evolution of maize trade and marketing policies in Kenya has been marked by frequent and usually unanticipated changes in trade tariffs, NCPB prices set and volumes purchased (Ariga, Jayne et al. 2010). Empirical studies showed that these discretionary policies raised market uncertainties for private stakeholders and led to inefficiencies (Chapoto and Jayne 2009; Tschirley and Jayne 2010).

The evolution of Nairobi maize wholesale prices from January 1994 to December 2009 is depicted in Figure 4. Nominal data were deflated by the traditional consumer price index.

Figure 4. Nairobi maize wholesale real prices in Kenya (KSH/kg)



At first sight, maize price volatility does not look as constant through time: that motivates a deeper analysis on the structural factors of volatility. Policies could be considered as such a structural factor. Indeed, prices seem to be characterized by lower amplitude variations in the recent period that corresponds to reinforcement of maize marketing and trade policies. We calculated the coefficients of variation corresponding to the period 1994-1999 and to the period 2000-2009. This choice has been motivated by the fact that 2000 corresponds to a reinforcement of both maize marketing and trade policies. It appears that prices are more stable in the 2000-2009 period (CV = 19%) than in the 1994-1999 period (CV = 24%). However, if the coefficient of variation is a meaningful measure of price variations, we saw that it does not account for the predictable component of volatility.

An ARCH modelization of food price distributions in Kenya

ARCH models are used to characterize and model observed time series (Engle 1982). ARCH modeling allows simultaneous estimation of temporal variation in the conditional mean and variance of a dependent variable, which is in our case the deflated maize price. The analysis of the error term of the mean equation at any time t can provide useful information when one wants to interpret price predictability. In particular, the conditional variance of the error term of the mean equation is rarely homoscedastic, and this variance can be interpreted as a measure of price unpredictability: this is basically what has been done by Shively and Barrett who wanted to assess the impact of policy reforms on price volatility (Shively 1996; Barrett 1997). Therefore, significant explanatory variables of conditional variance are valuable explanatory factors of price unpredictability. This price unpredictability is not exactly synonymous with volatility; it captures the unpredictable component of price volatility as measured by the squared difference between the actual price and the predicted price

from a model using a given set of explanatory variables known by most market participants at the time that the prediction is made.

The ARCH model general structure is as follows.

$$p_{it} = \beta_0 + \sum_{k=1}^{s} \beta_k p_{i,t-k} + \gamma' X_{it} + \varepsilon_{it} \qquad \varepsilon_{it} \qquad iid\mathrm{N}(0, h_{it}) \tag{1}$$

$$h_{it} = \alpha_0 + \sum_{k=1}^{r} \alpha_k \varepsilon_{it-k}^2 + \sum_{k=1}^{q} \omega_k p_{i,t-k} + \lambda' X_{it} + \nu_{it} \tag{2}$$

Where the subscripts *i* and *t* stand for region and monthly period respectively. Equation (1) is the mean equation, that determines the maize price p_{it} process as an autoregressive process of *s* periods, and a vector X_{it} of exogenous variables explaining the level of maize price. A least square estimation of such a process generates a heteroscedastic error term and biased estimates. Equation (2) determines the conditional variance of the error term of equation (1), as an autoregressive process of *q* periods, by past prices, and by the same vector of exogenous variables explaining price unpredictability, X_{it}. The observed price for a month is a linear function of a constant, the lagged month's price, a monthly time trend, the real exchange rate, the international price, maize buffer stock release, and a seasonal dummy variable.

Data

Many factors are likely to influence food price volatility. Basically, food price volatility is related to supply and demands fundamentals, which are likely to include market-specific and broader economic factors (Roache 2010), and changes in these factors may have large effects because the short run supply and demand elasticities of food prices are typically low (Balcombe 2009). The following factors are taken into account in our analysis, and correspond to the ones included in Barrett's model specification (Barrett 1997).

Past prices. There are periods of relatively high and low price volatility, though the underlying unconditional volatility remains unchanged. This principle underlines the choice of an ARCH model. Nominal data were deflated by Kenyan consumer price index to construct real price series for maize from January 1994 to December 2009.

Inflation. Inflation has an obvious direct effect on food price volatility: to account for this effect, we have been working on consumer price index deflated price series.

Stock levels. Stocks have an important role in theoretical models of commodity pricing (Williams and Wright 1991; Deaton and Laroque 1992). In theory, when stocks are low, volatility is expected to increase; empirical evidence, so far, has been mixed. To account for this potential effect, we used data

of the United State Department of Agriculture (USDA PSD database) to include stocks levels in our model.

Exchange rate. Volatile exchange rates are likely to induce a higher volatility in food prices, as the riskiness of returns increases (Balcombe 2009). Exchange rate data, obtained from the Kenyan Bureau of Statistics, are included in the first step of our model.

International price. International price was calculated as prevailing international market prices, extracted from the database of United Nations Conference on Trade and Development (UNCTAD) converted into KSH at the nominal exchange rate and then deflated by Kenyan CPI.

Other economic factors that potentially influence food price volatility were not included because of lack of data or redundant information, such as weather patterns[5], oil price volatility[6], and speculation[7].

Added to these common economic factors that constitute the heart of Barrett's model specification, we integrate in our model one additional "institutional" factors reflecting policy inconsistency. We approximate policy inconsistency by the dynamic analysis of import tariffs policies in Kenya related to international prices. Two proxies are tested: instantaneous inconsistency and temporal inconsistency.

INST_INCONS is a dummy that equals one for the event of simultaneously high international price (higher than its average) and high tariff (higher than its average) or of simultaneously low world prices and low tariff. In these events, policy is inconsistent with the objective of removing effects of world price instability. In all other cases, INST_INCONS equals zero;

TEMP_INCONS is a dummy that equals one at time t if the moving average of the world price has been increasing for 6 months before t, and if the tariff has not been decreasing between t-1 and t or, conversely, if the moving average of the world price has been decreasing for the last 6 periods of time before t, and if the tariff has not been increasing between t-1 and t.

The variables description is summarized in table 2.

[5] Extreme weather events (drought, floods) are directly affecting agricultural productivity (Haile 2005). Thus, these events are one important source of food price volatility and extreme climate indices are used to analyze the impact of climate volatility on poverty (Ahmed et al 2009).

[6] Recent empirical work has suggested a transmission of prices between oil and food prices, trough the channel of fertilizer prices, mechanized agriculture and freight costs (Balcombe 2009). To account for this effect, some authors introduce the US CPI deflated petroleum spot price (International Monetary Fund data).

[7] The impact of speculation on food price volatility is a controversial debate (Roache 2010). Roache, S. (2010). What explains the rise in food price volatility? . I. W. P. WP/10/129, International Monetary Fund.

Roache, S. (2010). What explains the rise in food price volatility? . I. W. P. WP/10/129, International Monetary Fund.

Table 2. Explanatory variables used

Variable name	Variable description	Sources
lagged prices	Nairobi maize wholesale real prices (ZMK/kg)	Bureau of Statistics (CPI), Ministry of Agriculture (nominal prices)
Stock levels (STOCK)	Annual stock level (MT)	USDA PSD database
Exchange rate (ER)	ZMK/USD	Bureau of Statistics
International price (IP)	Maize real international price (USD/kg)	US Bureau of Labor Statistics (US CPI), UNCTAD (nominal prices)
Policy inconsistency (INST_INCONS and TEMP_INCONS)	Import tariffs variability	Calculations from Ministry of Trade and Industry data

Empirical model specification

Above data have been collected in 6 areas in Kenya, and we thus have 6 time series for price. We introduce a dummy variable for each of these areas (but one to avoid multicollinearity), both in mean and variance. We also introduce a dummy variable for the post-harvest season to capture seasonal regularities in prices and in price unpredictability. We also introduce a monthly trend in both processes. The level of stock at the beginning of each year (STOCK) is also an explanatory factor both for the price level (with a negative effect expected) and for price unpredictability (with a negative effect expected). Mean and conditional variance specific variables are international price level (IP), the yearly exchange rate (ER), the level of stock (STOCK), and the policy inconsistency (INCONS) taking the value INST_INCONS or TEMP_INCONS.

$$p_{it} = \beta_0 + \beta_1 p_{it-1} + \gamma_1 IP_t + \gamma_2 ER_t + \gamma_3 STOCK_t + \gamma_4 TREND_t + \\ + \gamma_5 INCONS_t + \theta_3 S_3 + \sum_{r=1}^{6} \phi_r R_r + \varepsilon_{it} \quad (3)$$

$$h_{it} = \alpha_0 + \alpha_1 \varepsilon_{it-1}^2 + \omega . p_{it-1} + \lambda_1 IP_t + \lambda_2 ER_t + \lambda_3 STOCK_t + \lambda_4 TREND_t + \\ \lambda_5 INCONS_t + \rho_3 S_3 + \sum_{r=1}^{6} \mu_r R_r + \nu_{it} \quad (4)$$

Positive coefficient for UNPREDI, $\lambda_5 > 0$, means that the tariff policy unpredictability tends to favour more volatile prices.

4. *Results*

Results from the ARCH model estimates from maximum likelihood estimation are found in Table 3. The mean equation shows that the maize price is an autoregressive process with a strong monthly autocorrelation. In average, maize price in Kenya appears significantly decreasing. There is no

significant effect of international prices on price level. As expected, the exchange rate tends to increase domestic price, and the level of stock has a significant decreasing effect on price level. Highly significant seasonal effects are as expected, and correspond to post-harvest times. These results are consistent with Sively (1996) and Barrett (1997).

Table 3. Estimates of ARCH model

	Instantaneous inconsistency		Temporal Inconsistency	
	Mean	Conditional variance	Mean	Conditional variance
Constant	-0.003	0,007	0,053	1,05 E-8
	(-0,07)	(1,36)	(1,3)	(0)
Lagged price	0.90	0,0099	0,014	0,018
	(63,36)	(6,63)	(64,7)	(8,0)
International price	0,03	-5,8 E-22	0,055	-1,7 E-20
	(1,64)	(0)	(2,76)	(0)
Exchange rate	0,002	9,7 E-24	0,0019	0,0001
	(3,34)	(0)	(3,18)	(2,48)
Stock	-0,000097	6,4 E-9	-0,00014	-1,39 E-24
	(-2,75)	(0)	(-4,01)	(0)
Trend	-0,000035	2,5 E-9	0,00017	-7,7 E-23
	(-0,15)	(0)	(0,79)	(0)
INST_INCONS	-0.004	0,003	-	-
	(-0,49)	(3,63)		
TEM_PINCONS	-	-	-0,029	0,0029
			(-3,34)	(3,39)
Post harvest dummy	-0,038	0,0008	-0,04	0,0009
	(-4,47)	(0,87)	(-5,32)	(1,05)
Region Kit	0,001	0,0026	0,006	0 ,003
	(0,11)	(2,21)	(0,54)	(2,81)
Region NAi	0,0006	-9,97 E-23	0,006	1,06 E-22
	(0,05)	(0)	(0,53)	(0)
Region Kis	-0,0008	-5,1 E21	0,002	4,88 E-22
	-0,06)	(0)	(0,21)	(0)
Region Mom	-0,001	8,7 E-24	0,005	-4,4 E-24
	(-0,08)	(0)	(0,43)	(0)
Region Eld	-0,004	0,0005	0,00001	0,00014
	(0,01)	(0,48)	(0)	(0,14)
ARCH1		0,10		0,12
		(2,39)		(2,8)
	N=912		N=912	
	R^2=0,87		R^2=0,88	

t value in parentheses

Regarding the analysis of the conditional variance, the most interesting result is the highly significant positive effect of tariff policy inconsistency, showing that unpredictable policies tend to generate more volatile prices. It might appear unsurprising that policy inconsistency increase price volatility but the contribution is essentially empirical. It draws the attention on the fact that a policy instrument like variable tariff is not per se a stabilizing policy. Only when it is used with temporal consistency is it an

efficient policy for stabilization. Stocks and policy effectiveness do not appear to have a significant effect on food price volatility. We do not have convincing explanation for the absence of any significant effect of stock on food price volatility. This finding stands in contrast with Jayne, Myers and Nyoro's observations that NCPB activities have stabilized maize prices in Kenya (Jayne, Myers et al. 2008) and with Barrett results (Barrett 1997). It could be interpreted in another way: it may be less the choice of the policy (public storage) than the fact that this policy is implemented in a transparent way that matters. Indeed, the structural effect of institutions (policy unpredictability) has a potentially greater role than short term environment, including stock level. The absence of significant effect of policy effectiveness may be related to the proxy used in this paper: this proxy, extracted from the World Governance Indicators database, is not specific to maize price policies implemented in Kenya, and encompass a rather large set of policies (to better address institutional factors, our paper may benefit from a fieldwork research in Kenya).

5. Conclusion

In the last twenty years, the debate has shifted from whether State led regulation is better than market led regulation, to one in which the major issues concern the way in which state and market can be integrated to provide the most effective coordination (Dorward, Kydd et al. 2005). Drawing from the Kenyan case, we found that a low predictability of policies could reduce the capacity of these policies to lower food price volatility. Policy inconsistency is likely to be even more prevalent in the context of fragile states. The fact that these factors may influence policy results does not mean that no public intervention is needed to manage food price volatility but rather, that government actions should be as rule-based and transparent as possible (Poulton, Kydd et al. 2006), or at least based on transparent advance consultation between the state and the private sector over future policy actions. In the current context of price swings, governments may be tempted to implemented policies that were successful in tackling food price volatility in other contexts. Our results indicate that « context matters » and suggest to care together about the nature of the policy tool and the institutional conditions of its enforcement.

Our results appeal for a better integration of governance issues in the analysis of food prices stabilization policies, and some important research questions arise. How to reinforce policy predictability and policy effectiveness? How to design institutions that engender greater trust between public and private actors? Empirical policy analysis set out that concertation between different stakeholders could facilitate policy credibility (David-Benz, Rakotoso et al. 2010). The implementation of consultative processes involving a broad range of stakeholders should be recommended, even if "*the policies emerging from such a process are not likely to approximate first best recommendations*" (Tschirley and Jayne 2010).

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