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Killing the goose? The value chain for sorghum beer in Kenya

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Abstract

Purpose – The decision by the Government of Kenya in 2013 to increase tax revenue by imposing excise duty of 50 percent on sorghum beer resulted in economic losses for smallholders, the brewery, and the government itself because it effectively killed the value chain. In 2015, the government reversed the policy decision and reduced excise duty to 10 percent. The purpose of this paper is to analyze the impact of this policy decision on the value chain, adaptation by growers and the brewery, and the rationale for this policy change and its reversal.
Design/methodology/approach – The author analyzes this episode using a conceptual framework derived from complex adaptive systems, focusing on four properties of such systems: sudden, endogenous shocks, interacting agents, and adaptation.
Findings – The author shows how the nature of politics in Kenya exposed the value chain to endogenous shocks as the result of conflicts between interacting agents, where smallholder farmer organizations were important for successful adaptation. Conflicts between development and political objectives in neo-patrimonial states are sources of complexity and uncertainty in smallholder value chains.
Research limitations/implications – Complex adaptive systems proved a useful framework to understand decision making by government and business actors in the value chain.
Originality/value – The paper applies a novel conceptual framework to the analysis of an important value chain in Kenya.

Keywords Agriculture, Kenya, Value chain

Paper type Research paper

1. Introduction

> A cottager and his wife had a goose that laid a golden egg every day. They supposed that the goose must contain a great lump of gold inside, and in order to get the gold they killed her. Having done so, they found to their surprise that the goose differed in no respect from their other geese. The foolish pair, thus hoping to become rich all at once, deprived themselves of the gain of which they were assured day by day (TRADITIONAL FABLE).

Smallholder value chains sometimes behave in unpredictable ways. There are some obvious reasons for this. On the supply side, production may be interrupted by climatic events that lead to a poor harvest that leaves smallholders with little to sell, or forces them to prioritize home consumption. On the demand side, competition may push up prices and reduce demand from some end-users, which in turn may reduce the supply of specific products. Sudden changes in government policy may affect both supply and demand by creating incentives for growers to increase production, or by imposing periodic trade bans that reduce access to regional or global markets. In combination, these factors create an uncertain environment for smallholder value chain development.

The story of sorghum beer in Kenya illustrates the importance of government policy for the development of smallholder value chains. The successful development of this value chain was possible only because of a tax break that made sorghum beer competitive in price with illegal brews. However, this left the future growth of the value chain vulnerable to changes in policy. The sudden removal of this tax break in 2013 brought the growth of the value chain to

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a shuddering halt, and resulted in lower profits for the brewing industry and loss of income for smallholders. Ironically, the increase in government revenue from the excise duty was far below expectations, making the change in policy counter-productive. The episode brings to mind the old fable of "killing the goose that laid the golden eggs."

In the language of complex systems, the value chain for sorghum beer was sensitive to initial conditions. This sensitivity reflects the close connection between business and politics in Kenya. In the case of sorghum beer, this had two aspects. First, sorghum beer was as much a political as a commercial creation, because without government's agreement to waive excise duty it was not commercially viable. From the government side, sorghum beer was seen as an instrument of social control, extending its reach over the extensive trade in illicit brews that accounted for 40 percent of the market for alcohol, and a step toward imposing order over an area outside state control. Second, politics in Kenya is dominated by ethnic rivalries. The concentration of crops and livestock in specific regions means that "there is a strong association between a particular [ethnic] group and most of the main agricultural value chains in the country" (Poulton and Kanyinga, 2014). Sorghum's concentration in Eastern Kenya made the value chain vulnerable to these rivalries when the region ended up on the losing side. Defeat in the election of 2013 left Eastern Kenya dangerously exposed. The decision by the new government to impose excise duty on sorghum beer was as much a tax on political opponents as a device for boosting government revenues. Thus, the close connection between government and business could work to the disadvantage as well as to the advantage of the value chain. Government policy can both make and break smallholder value chains.

The episode raises a number of research questions:

RQ1. What effect did the imposition of excise duty have on the value chain?

RQ2. Why did government initially agree to a zero excise duty and then suddenly change its mind?

RQ3. How did the value chain actors adapt to this policy change and why, after just two years, did government execute a U-turn and reverse its decision to impose excise duty on sorghum beer?

The development of clear sorghum beer and the impact of the policy change are well documented. This study synthesizes information both from primary sources (national statistics on beer consumption, the national press, and company reports) and from secondary literature, including business case studies based on personal interviews with brewery executives, policy studies and briefs, and studies of alcohol consumption in Kenya. One limitation is the absence of primary data from interviews with the civil servants and policy makers responsible for this change in policy. Since we did not have access to these individuals, our analysis of the rationale for this decision is based on circumstantial evidence, including their justification to Parliament and the nature of policy making in Kenya. Given its politically sensitive nature, the reasons for this policy decision and its sudden reversal may never be fully known.

The general objective of this paper is to answer these questions using a conceptual framework based on complex adaptive systems (Orr *et al.*, 2018). Specifically, we apply four of the common properties of this framework. First, we use the properties of sudden and endogenous shocks to illustrate the impact of this policy change on the value chain. Second, we use the property of interacting agents to understand the behavior of different value chain actors. Third, we use the property of adaptation to deepen our understanding of how different actors responded to this policy change. To the extent that other value chains are also vulnerable to sudden changes in government policy, the findings have wider relevance for understanding the development of smallholder value chains.

The paper is divided into six sections. Following this introduction, Section 2 describes the value chain and the policy shock. Sections 3 and 4 analyze the interactions between agents that led to the policy decision, and how these agents adapted. Wider issues raised by this episode are discussed in Section 5. The final section concludes.

2. Sudden and endogenous shocks

In economic models, changes in tax policy are treated as an exogenous shock. However, this restricts the analysis to explaining the effects of economic policy rather than its causes. It treats government as a *deus ex machina* outside the system. However, if we view the economy as a complex adaptive system of which government is a part, then we cannot avoid the question of why certain policy decisions are made. From the perspective of complex adaptive systems, therefore policy is endogenous because it is created by interacting agents within the system. Thus, the decision to hike the excise duty on sorghum beer policy was not something like rainfall, over which agents had no control, but was the result of a process of negotiation between different actors in the value chain. Hence, we should not see shocks as something external to the value chain, but also as generated from within the value chain, by uncertainty, by technological change, and also by "interacting agents" whose individual behavior can have unpredictable results for the system as a whole (Orr *et al.*, 2018). Again, complex systems are characterized by sudden changes, caused by feedback loops, where the system lurches suddenly to a new equilibrium (Orr *et al.*, 2018). The value chain for sorghum beer in Kenya illustrates the role of these two common properties of complex adaptive systems. In this section, we set this sudden, endogenous shock in historical perspective, placing it within the wider context of the growth of the brewing industry, its contribution to government revenue, and the government's fiscal policy.

A wide variety of alcoholic drinks are available in Kenya. Table I describes the drinks mentioned in this paper, distinguishing between "commercial" beers and "home-brews." In Kenya, "home-brew" spirits (*chang'aa*) have always been illegal while traditional "home-brew" beers (*busaa*) were declared illegal by President Moi in 1979 (Willis, 2002)[1], although they were still widely consumed, often with the connivance of the police (Bodewes, 2010; Roberts, 2000; de Smedt, 2009). The Liquor Act of 2007 legalized *busaa* but not *chang'aa* (Mutisya and Willis, 2009).

Although traditional opaque beers have a long history in Kenya, the commercial production of clear lager beer began in 1922, with the establishment of Kenya Breweries Limited (KBL) (Willis, 2002). By independence in 1963, KBL was part of East African Breweries Limited (EABL) with subsidiaries in Tanzania (Tanzania Breweries Limited) and a major share in Uganda Breweries (Rodwell, 1982). With consolidated profits of GBP1.5 million and assets of GBP1.6 million, KBL was Kenya's largest local company (Rodwell, 1982). When in 1947 Kenya revoked the legal ban on Africans drinking bottled beer, the stage was set for the take-off of the formal brewing sector. By 2011, EABL was the second biggest company in Eastern Africa valued at $1,599 million (*African Business*, 2012). Not surprisingly, the history of EABL is seen as "an unmitigated success story" (Partanen, 1991).

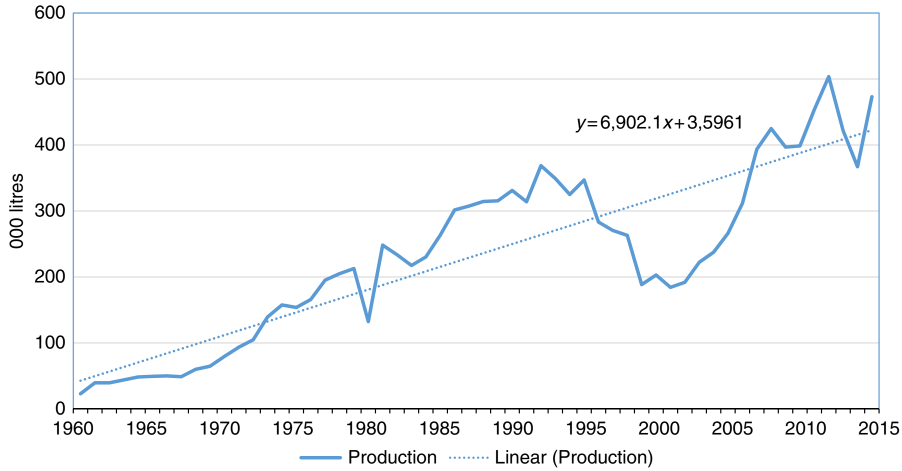
Figure 1 shows beer production in the formal sector between 1960 and 2015. This represents total beer production – there is no separate series for clear sorghum beer, which was not introduced in Kenya until 2006[2]. By 2009, Senator keg had overtaken Tusker as Kenya's biggest-selling beer by volume (Ogola and Mungai, 2011b). According to Euromonitor, by 2011 Senator keg was the second-most popular beer in Kenya, commanding 15.3 percent of the beer market by volume, and had earned EABL $380 million in net sales[3].

Over the period 1960-2015, the production of beer in Kenya rose from 23,000 to 4.7 million liters. Except for a dip in 1980, the period 1960-1992 was a period of uninterrupted growth. During the 1970s, KBL worked at full capacity and struggled to meet demand (Rodwell, 1982). However, the ten years 1992-2002 saw a sharp and prolonged fall in

Name	Legal status in Kenya	Starch source	Amylolytic agent	Fermentation	Alcohol content (% v/v)
Commercial					
Clear Lager Beer (Tusker)	Legal	Barley	Barley malt	Brewers' yeast	4.2
Clear Lager Beer (Senator Keg)	Legal	Sorghum and barley	Barley malt	Brewers' yeast	6
Opaque sorghum beer (*chibuku*)	Legal	Sorghum	Sorghum malt	Brewers' yeast	2-4
"New generation" or "power" drinks	Unclear	Millet, maize, banana, pineapple juice, etc.	Na.	Yeast	10-25
Home-brews					
Opaque beer	Illegal until 2007	Sorghum	Sorghum malt	Wild yeasts	2-4
Opaque beer (*busaa*)	Illegal until 2007	Maize, maize flour	Finger millet malt	Wild yeasts	2-4
Spirits *(chang'aa)*	Illegal	Maize beer residues, jaggery	Na.	Bakers' yeast	25-60

Notes: Home-brewed opaque beer made from sorghum was never common in Kenya. In semi-arid eastern Kenya, where sorghum is still widely grown, opaque beer was usually made from honey or sugarcane (Lindblom, 1920/1969, pp. 518-519), or millet if these were not available (Dundas, 1913, p. 503). Cheap imports and mechanical cane-crushers increased the use of sugar for brewing beer (Ambler, 1991, pp. 168-169). Nout's (1981) review of traditional beers in Kenya does not mention beer made from sorghum
Sources: Opaque beer (*busaa*), opaque sorghum beer (*chibuku*) and home-brew spirits (*chang'aa*) (Nout, 1981); Opaque beer (*pombe*) (Bryceson, 2002); "New generation" or "power" drinks (Willis, 2003); for legal status see Willis (2003)

Table I. Alcoholic beverages mentioned in the text



Source: Kenya National Bureau of Statistics (1960-2016)

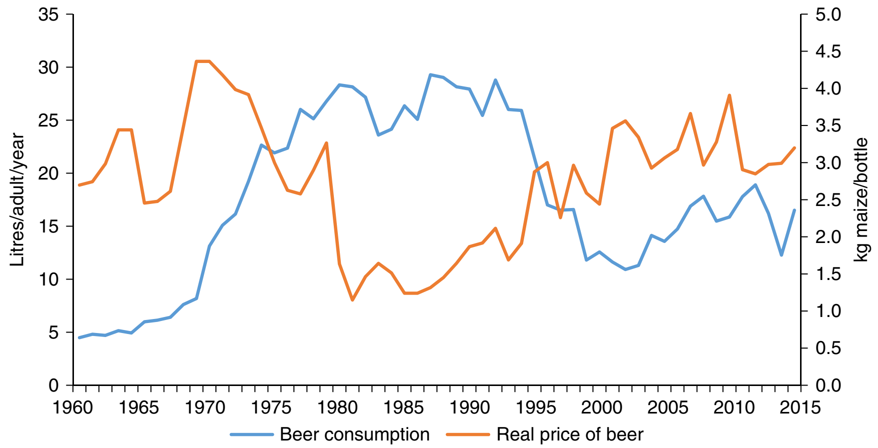
Figure 1. Beer production in Kenya, 1960-2015

production from 3.7 to 1.9 million liters per year. This represented a drop of 48 percent. By comparison, in the period 2012-2014 production fell sharply from 5.6 to 3.4 million liters, representing a drop of 27 percent. Thus, the crisis over sorghum beer was not the first time that beer production in Kenya had experienced a sudden shock. Moreover, the drop in 2013 was neither as severe nor as prolonged as that in 1992. As we shall see in Section 3, both these sudden drops in production were the direct result of government policy.

Beer consumption in Kenya shows a similar picture (Figure 2). Consumption per head rose strongly after 1960, reaching 28 litres/adult/year in 1980. Average consumption then remained steady for the next decade before plunging in 1992, reaching a low point of 11 liters in 2002, before recovering to reach 19 litres/adult/year in 2012. Consumption fell sharply again between 2013 and 2014 to 12 litres/adult/year, before recovering to 17 litres/adult/year in 2015. Since the 1990s, average consumption has remained at less than half the level reached in the 1970s and 1980s. The only available price series for beer is for Tusker, EABL's flagship brand. To compute the real price of beer, we deflated the retail price of Tusker by the retail price of maize grain. The results show that rising beer consumption in the period 1960-1980 was aided by falling real prices for beer, from 4.4 kg maize/bottle in 1970 to just 1.1 kg maize/bottle in 1981. At this period in Kenya's history, the price of beer was directly controlled by government, and these controls were lifted only in the 1980s. Since the early 1990s, there was a steady rise in the real price of bottled beer, which reached between 3 and 3.5 kg maize/bottle in the last decade. The result was to exclude many potential customers from the formal sector, forcing them to rely for alcohol on the informal sector, including illicit brews (*chang'aa*) with their high-health risks.

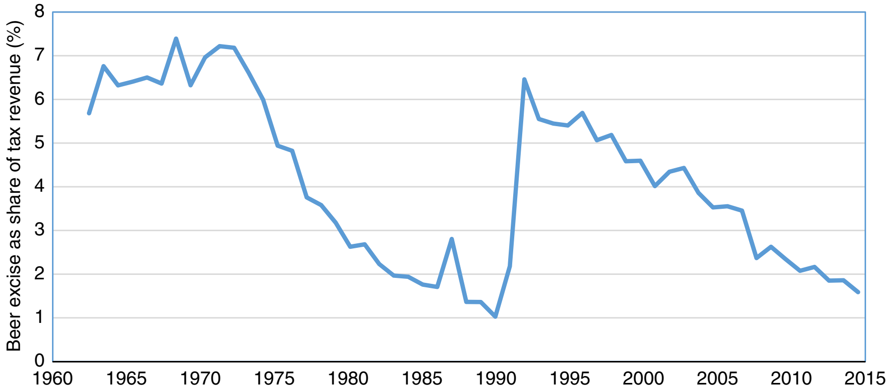
As elsewhere, alcohol in Kenya is a lucrative source of government revenue. Figure 3 shows the share of excise duty on beer to total tax revenue. The results are the reverse image of beer production. While the period 1960-1992 saw a steady rise in beer production and consumption (Figures 1 and 2), the same period saw a fall in the share of tax revenue from excise duty on the sale of beer, which dropped from 6 to 7 percent in the early 1970s to just 1 percent in 1990. Conversely, the steep fall in beer production and consumption after 1992 and the rise in the real price of beer from the 1990s were mirrored by a rise in the share of excise duty on beer as a share of total tax revenue. This climbed sharply to reach its previous level of 7 percent. Subsequently, however, the share of excise duty on beer started a slow decline until by 2015 it had reached just 2 percent to tax revenue, close to the lowest level reached in the early 1990s.

The sudden drop in beer production in 2013 was caused by the government's decision to hike the excise duty for sorghum beer. In September 2013, a new tax regime came into force through the Customs and Excise Act that introduced excise duty on beer made from



Source: Kenya National Bureau of Statistics (1960-2016)

Figure 2.
Beer consumption per head and real price of beer, 1960-2015



Source: Kenya National Bureau of Statistics (1960-2016)

Figure 3.
Beer excise as share of total tax revenue, 1960-2015

sorghum, millet, or cassava at 50 percent of the rate charged on other beverages on top of the 16 percent VAT that beer already attracts. The new tax measure added 35 KES/liter to the cost of producing sorghum beer. EABL passed most of this increase on to 1 he consumer. As a result, the price of 300 ml glass increased from KES20 to between KES45 and KES50. Unfortunately, we do not know the price elasticity of demand for clear sorghum beer. However, we know that the consumption of Tusker beer is price elastic with an own-price elasticity of demand of –1.1 in the short run and 2.12 in the long run (Karingi *et al.*, 2001). Thus, a 10 percent increase in the price of Tusker reduces demand for lager by 10 percent in the short run and 22 percent in the long run. If we assume the same unitary short-run price elasticity of demand for clear sorghum beer as for Tusker, then increasing the price Ks20 per 300 ml glass to Ks45 would have reduced sales significantly. According to the brewing industry, sales volume fell by over 75 percent (EABL, 2014). A price increase of 50 percent that resulted in a 75 percent drop in sales implies a short-run price elasticity of −1.25. Falling sales forced EABL to reduce production at its main Nairobi plant in Ruaraka from seven to five days a week[4]. The plunge in sales made the tax self-defeating. The government expected to generate an extra KES6.2 billion each year. However, analysis of tax remission by EABL to the government before and after the imposition of excise duty shows a 5 percent decline in tax remission and a 62 percent loss to the anticipated tax income with excise duty (Opiyo, 2014a). By contrast, when the government reduced the excise duty from 50 to 10 percent, the demand for sorghum by EABL trebled and tax revenues from clear sorghum beer increased by 30 percent (EABL, 2015).

The impact of this policy change was felt right along the value chain. Between 2009 and 2012, EABL had increased the utilization of sorghum from 474 to 12,715 tons (with the greatest increase reported between 2011 and 2012). In 2014, however, EABL purchased just 4,500 tons. Intermediaries – the companies and small traders that collected and transported sorghum to EABL – found that business had dried up. Sorghum growers – mostly smallholders in semi-arid Kenya who relied on sorghum for cash income – were left without a cash crop. The exact number of farmers affected is unknown. According to EABL, the number of smallholders supplying the brewery reached 60,000 by 2013 (East African Breweries Limited (EABL), 2013). The average quantity of sorghum marketed by smallholders in Kitui county in 2012-2013 was 305 kg/household (Orr *et al.*, 2014). Using this figure and a total utilization of 12,715 in 2012 gives the number of smallholders supplying sorghum to EABL as 41,668. However, EABL sourced sorghum from Sudan and Tanzania as well as Kenya. Hence, the number of small farmers affected in Kenya was somewhere between 20 and 30,000. One estimate put the total cost of the damage caused by the excise duty at KES6,396,463, of which 4,138,130 (65 percent) was incurred by EABL, 2,000,000 (31 percent) by the government in lost tax revenue, 180,050 (3 percent) by sorghum growers, and 78,283 (1 percent) by intermediaries (Opiyo, 2014a). The basis for these figures is not given. Whatever the real figure, the damage was certainly substantial. On the other hand, these estimates do not take account of the benefits from the hike in excise duty that might have resulted for other sectors of the economy, notably the manufacturers and retailers of home-brewed beer and spirits (chiefly women) and their suppliers.

3. Interacting agents

Complex adaptive systems are characterized by interacting agents, where the behavior of individual agents is not fixed but depends on the behavior of other agents. Small differences between agents can therefore have a large effect on the overall system, and interaction between agents can produce unpredictable results. Thus, interacting agents generate uncertainty from within the system (Orr *et al.*, 2018). In this section, we analyze the interactions between the key actors in the value chain for sorghum beer. In particular, we focus on interactions between government and EABL and the breakdown in this relationship which led to the imposition of excise duty on sorghum beer.

Kenya is a prime example of a "neo-patrimonial" state, in which political patrons use state resources to buy loyalty from clients. Business and politics in Kenya are closely intertwined (Hornsby, 2013). Successful businessmen become politicians, and successful politicians use their power to become businessmen. Political vendettas are carried over into the world of business, with economic weapons used to settle political scores. In these systems, political parties are not based on ideology, but are factions that combine simply to win elections. Consequently, a "policy change" is not part of a wider ideological agenda but is designed to keep the ruling party in power, by buying friends or punishing enemies.

The relationship between EABL and government has been mixed (Table II). Until the 1990s, the relationship was harmonious. After independence, the twin objectives of the government's industrial policy were import substitution (replacing imports with products made in Kenya) and Africanization (jobs for black Kenyans). This suited EABL. Kenya Breweries has always marketed itself as a "national company," wrapping itself in the

1992	General and presidential elections, December
1993	Government increases combined taxes on beer to 153% per unit
1993-2003	Beer consumption in Kenya falls from 14 to 8 liters per capita
1997	EABL launches "Citizen" Lager, a non-malted, bottled barley beer
1998	SABMiller enters Kenyan beer market with subsidiary Castle Brewing, Thika
2002	SABMiller exits Kenyan beer market
2003	EABL launches "Senator" a non-malted barley beer, for $0.33 per 300 ml bottle
2004	Government reduces excise tax for non-malted keg beer to 30%
2004	EABL re-launches "Senator" as "Senator Keg" for $0.27 per 300 ml glass
2006	Government reduces excise tax for non-malted keg beer by 100%
2007	General and presidential elections, December
2008	Production of "Senator Keg" overtakes production of "Tusker"
2009	EABL buys a majority stake in Serengeti Breweries, Tanzania
2010	Production of "Senator Keg" reaches 2 million hectoliters
2013	General and presidential elections, March
2013	Government introduces 50% excise duty on non-malted keg beer, October
2013	Alcoholic Drinks Control (Amendment) Bill 2010 (the "Mutotho law") restricts drinking hours and legalizes licensed production of bottled *chang'aa*
2013	Demand for Senator Keg drops by 75%
2015	Government reduces excise duty on sorghum beer from 50% to 10%, May

Table II. Timeline for sorghum beer in Kenya, 1993-2015

Kenyan flag to win the loyalty of domestic consumers and to enlist state support in fighting off foreign competition. This is illustrated by the "Beer War" between EABL and SABMiller, South Africa's biggest beer company. After independence in 1963, EABL swiftly bought out smaller breweries and enjoyed a virtual monopoly until 1998, when SABMiller bought Castle Brewing in Thika. Competition between EABL and SABMiller for Kenya's shrinking beer market saw EABL invoked patriotism by marketing its Tusker brand under the slogan "My Country, My Beer"[5]. The "Beer War" ended with a truce in 2002 when SABMiller sold Castle Brewing to EABL, which promptly closed it down. In return, EABL closed Kibo Breweries in Moshi, Tanzania, with SABMiller agreeing to distribute EABL beers in Tanzania and EABL agreeing to distribute SABMiller beers in Kenya. Victory for EABL in the Beer Wars was also a victory for import substitution and left EABL with a monopoly in the beer market in Kenya. Similarly, the Africanization of top management was an early priority for EABL, with the first African Kenyan directors appointed in 1959, and the first African Kenyan chairman in 1978 (Rodwell, 1982). Even before independence, most distribution was in the hands of Africans and "beer propelled the success of a new generation of African entrepreneurs" (Willis, 2002). Some, like the distributor Njenga Karume, became powerful politicians (Swainson, 1980). By 1977, nine in ten EABL shareholders were East African residents (Rodwell, 1982).

This relationship soured in the 1990s. EABL openly supported the transition to multi-party rule in 1992 (Willis, 2003). Kenneth Matiba, the first African Chairman of EABL (1978-1984) and himself an MP, and Charles Rubia, an EABL Director and the Mayor of Nairobi, led the campaign to topple President Daniel arap Moi (Hornsby, 2013). When Moi was unexpectedly re-elected President in 1992, EABL paid a heavy price. To help pay for Moi's re-election, the new government hiked the excise duty on bottled beer. Between 1993 and 1994, beer prices doubled in real terms (Figure 2). The share of beer in total excise revenue rose sharply, from just 16 percent in 1989 to 59 percent in 1994, and has remained at between 50 and 60 percent of total excise revenue to this day (Figure 3). Thus, the close connection between business and the state was a two-edged sword. Backing the wrong horse had serious consequences for EABL. Twenty years before a similar episode with sorghum beer, this experience demonstrated the effect that a sudden hike in excise duty could have on the demand for beer and on the brewing industry.

The close relationship between government and business was also evident in the decision by EABL to develop clear sorghum beer. From a government perspective, this was attractive for two reasons. First, it promised potential health benefits. Real income per head fell throughout the 1990s and did not recover until 2003. In 2006, real income averaged KES34,000 per head, the same level as in 1990 (Mwega and Ndung'u, 2008). This "lost decade" encouraged consumers to search for cheaper sources of alcohol (Willis, 2003), particularly illicit brews (Bryceson, 2002). In 1978, *chang'aa* accounted for one-third of all alcohol consumed in Kenya – twice as much as bottled beer and formal sector spirits combined (Partanen, 1991). Poisoning from *chang'aa* and "power drinks" captured the headlines[6]. The government was blamed for taxing beer beyond the reach of poorer consumers. This was not a challenge that the government could ignore. The legitimacy of the post-colonial state rested on its claim to be in control of development and the well-being of its citizens (Willis, 2002). The Ministry of Health supported EABL's campaign for tax breaks on non-malted beers, on public health grounds (Ogola and Mungai, 2011b). The second attraction for government was that it encouraged local production of sorghum. This was not without a political dimension. Eastern Kenya – the center of sorghum production – is home to the Akamba tribe, which had voted overwhelmingly for President Kibaki and his party in the presidential elections in 2002 (Hornsby, 2013). Stimulating the market for sorghum was a way of rewarding the Akamba for their political support.

For EABL, sorghum beer made good commercial sense. First, EABL faced stiff competition from "new generation" or "power drinks (Willis, 2003). These emerged as a direct response to higher prices for bottled beer. Although packaged as "modern" drinks, they were classed as "traditional," and attracted an excise tax of just 10 percent. In terms of alcohol content, "power drinks" were four to five times cheaper than EABL's "Citizen" lager and successfully competed for the lower end of the market. Although EABL successfully lobbied for a government ban on "power drinks" in 1998, this proved impossible to enforce[7]. At the same time, the government lifted the ban on the manufacture of palm wine, a favorite on the coast (Mutisya and Willis, 2009). Clearly, the lack of a consistent or effective policy toward illegal alcohol meant that EABL had to compete on price. Second, the devaluation of the Kenya shilling in the 1990s raised the cost of imported malt, while the price of barley also rose sharply in the 1990s relative to the price of sorghum (Orr *et al.*, 2014). Although Kenya produces barley, price fluctuations encouraged EABL to search for cheaper alternatives. According to EABL, replacing barley with a sorghum adjunct cut production costs by 20-30 percent[8]. Finally, in-house expertise was available through Guinness International Limited, which had bought 48 percent of EABL during the "Beer Wars" when EABL issued shares needed to raise capital (Willis, 2002). In 1997 Guinness merged with Diageo, which started the production of clear sorghum beer in Ghana in the early 2000s (van Wijk and Kwakkenbos, 2011)[9]. In combination, these factors made clear sorghum beer an irresistible commercial opportunity for EABL.

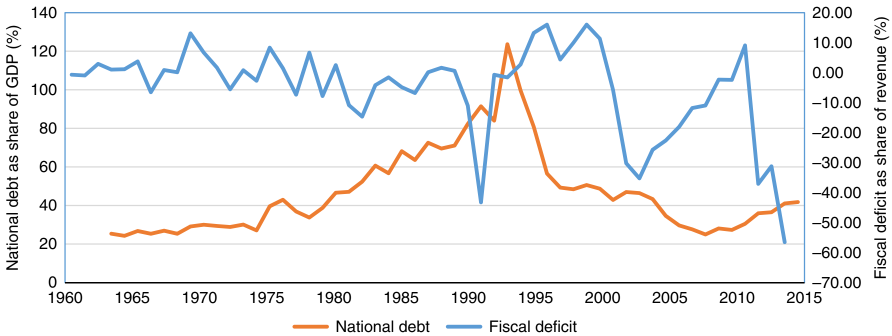
Clear sorghum beer was designed for a specific segment of the consumer market. The new beer was targeted at "aspirational" consumers wanting to "trade up" from home-brewed drinks who could not afford bottled beers made from more expensive malted barley. The decisive factor in this market was price. Kenya's first locally produced clear sorghum beer – Senator – was released in 2003[10]. Disappointing sales of Senator led to the decision to sell clear sorghum beer in kegs, rather than bottles, in order to reduce packaging costs[11]. Senator keg, launched in 2004, combined two "modalities" of alcohol usage (Bryceson, 2002), blending the sociability of the traditional, communal pot with the middle-class image of a clear, hygienic beer consumed in a modern setting. Senator keg bars, with their colorful branding, were like a sanitized shebeen. Despite this packaging, however, the price of Senator keg was still above the KES20 price point that would allow it to compete with local brews. To make Senator keg competitive, EABL had to persuade government to waive the excise duty on sorghum beer (EABL, 2013). The decisive factor in Senator keg's success was the tax break granted to non-malted beers. Market research by EABL revealed that 56 percent of alcohol consumption consisted of traditional fermented brews (*busaa*) or distilled spirits (*chang'aa)*, which were illegal and therefore untaxed. Eliminating excise duty would encourage consumers to switch to Senator keg, boost sales of legal beer, and allow government to collect some of the VAT and corporation tax lost from the sale of illicit brews. In 2004, the government granted a remission of 30 percent on excise duty, increased to 100 percent in 2006. This allowed Senator keg to be sold at KES20 (USD0.26) per 300 ml glass, the same price as most illegal brews (Ogola and Mungai, 2011b).

The tax break on Senator keg lasted until 2013, when the government re-imposed an excise duty of 50 percent. Beer made fully from sorghum, millet, and cassava continued to enjoy full remission in excise duty, however[12].

The government gave two reasons for the imposition of excise duty on sorghum beer (Business Daily, May 31 2013). First, the original objective of discouraging illegal brews was not being met. Second, consumers of bottled beer were switching to Senator keg. This posed a threat to revenue collection, since bottled beer carried a high excise duty[13]. The government had used the same argument to resist the call for tax exemption on Senator keg (Kanter and Bird, 2009). How justified were these claims? Senator keg may indeed have reduced demand for *chang'aa*, but there was no proof of this, since neither EABL nor the Ministry of Health had commissioned research to validate this claim[14]. The second argument is impossible to prove without comparing sales figures for different brands, which are a closely guarded secret. However, EABL was aware of this possibility. Senator, EABL's first attempt at sorghum beer, had reduced sales of other brands of bottled beer (Kanter and Bird, 2009). To avoid this, Senator keg was sold in specially branded outlets where retailers were forbidden to sell other EABL beers (EABL, 2013; Mutisya and Willis, 2009). On the other hand, EABL was planning to launch Senator Dark Extra (September, 2013) and Senator Stout (May 2014). As clear sorghum beer they were exempt from excise duty, but these were bottled beers targeted at higher-income consumers. This was not part of the original deal, where EABL had pledged to use a separate route to market for Senator keg in order that government would not lose revenue from excise duty on bottled beers (Kanter and Bird, 2009).

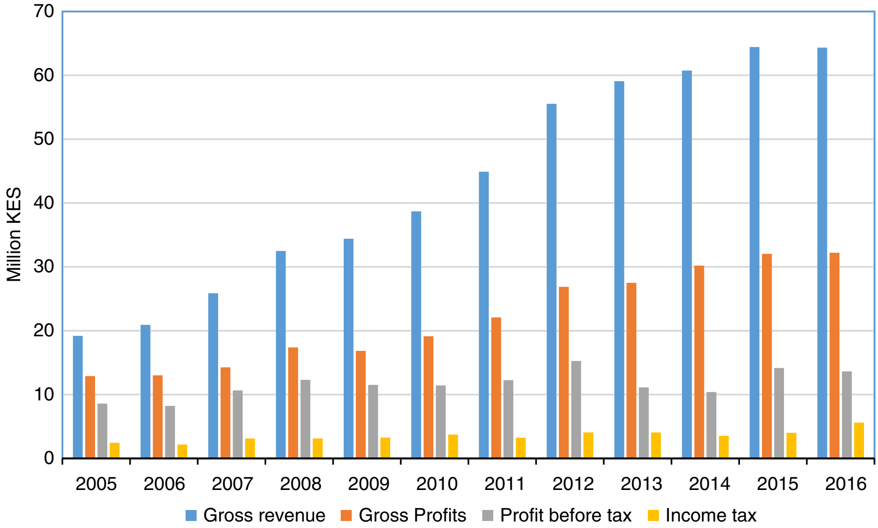
Besides these reasons given by the government, there were two other compelling reasons for the imposition of excise duty. One was the rising level of government expenditure. Just as President Moi's decision to raise excise duty on beer followed an election in December 1992, so President Kenyatta's decision to impose excise duty on sorghum beer followed elections in March 2013. The election brought a rise in the ratio of national debt to GDP (36 percent in 2012/2013) and the ratio of the fiscal deficit to government revenue (−37 percent in 2012/13) (Figure 4). This was attributed to the cost of the election itself and promises made during the election campaign, included decentralized county governments and higher salaries (World Bank, 2014). This made it imperative to raise government tax revenue. Excise duty on sorghum beer was expected to generate an additional KES6.2 billion in tax revenue.

Why did government target EABL? One reason may be the growing gap between company sales and income tax payments. Figure 5 shows key financial indicators for EABL between 2005 and 2016. Following the launch of Senator keg in 2004, EABL's net sales rose from KES19 million in 2005 (the year before full remission of excise duty) to 59 million in 2013. In the same period, income tax payments by EABL rose from KES2 million to KES4 million. However, the ratio of income tax payments to net sales fell from 13 percent in 2005 to just 7 percent in 2013. Thus, on top of the bonanza in sales revenue thanks to duty-free sorghum beer, EABL was also paying relatively less income tax. This may have raised suspicions (justified or not) that EABL was paying less than its fair share. Although the Government of President Uhuru Kenyatta was pro-business, the businessmen who had Kenyatta's ear were from the newer industries like telecoms, rather than from established industries like brewing (Booth *et al.*, 2014). And the new President was under no financial obligation to EABL. Kenyatta's family was so wealthy that it could pay its own election expenses without depending on financial support from business interests and others (Booth *et al.*, 2014).



Source: Kenya National Bureau of Statistics (1960-2016)

Figure 4.
National debt and budget deficit, Kenya, 1960-2015



Source: East African Breweries Limited (2005-2016)

Figure 5.
Sales and profitability for East African Breweries Limited, 2005-2016

Finally, we cannot discount political factors. The centers of sorghum production in Kenya are the Eastern region (home to the Akamba tribe) and Western region (home to the Luo). These were the power bases of Raila Odinga, the opposition presidential candidate, and of Odinga's running-mate Kalonzo Musyoka. In the 2013 election that brought President Uhuru Kenyatta to power, Eastern and Western Kenya voted solidly for the opposition. Just as with EABL in 1992, sorghum growers in Kenya had backed the losing side and could not expect any favors from those in power.

Adaptation

Complex systems are "adaptive" because they evolve and learn. Adaptation is defined as "change in behavior to ensure survival or success" (Mitchell, 2009). In this section, we compare the adaptive strategies used by the different actors in the value chain. Ultimately, these strategies succeeded in making government reverse its decision to impose a 50 percent excise duty on sorghum beer.

The strategies followed by EABL illustrate how large companies successfully adapt to shocks. One strategy was innovation. Following the decline in sales of Senator keg as the result of higher prices, EABL simply replaced Senator keg with a new product, a cheap spirit called Jebel Gold[15]. Already in the innovation pipeline, the launch of Jebel Gold was accelerated following the imposition of excise duty on Senator keg (EABL, 2014). Packaged in a 30-liter keg dispenser, and competitively priced at KES10-15 per 30 ml tot, Jebel Gold was a remodel of the bottled Jebel Special brand, which EABL had introduced in 2012 at KES100 for a 200 ml bottle (EABL, 2013). Just like Senator keg, Jebel Gold was targeted at the consumer segment of "aspirational" drinkers trading up from *chang'aa*. Sales of Jebel Gold grew by 32 percent in 2014 (EABL, 2015).

A second adaptive strategy was to cut dividends, from KES8.75/share in 2012 to KES5.50/share in 2013 and 2014 (EABL, 2013, 2014). This was a significant cut of 37 percent. Thus, shareholders suffered. However, the impact on the profits of EABL was far less severe. Profits before tax fell by just 6 percent between 2012 and 2013 (Figure 4). As a diversified company with multiple brands and subsidiaries in Uganda, Tanzania, and south Sudan, EABL was well insulated from sudden shocks to a specific brand in one location. As the Group Chairman reported, "The impact of the duty rise in Senator keg was cushioned by the stronger sales growth in premium and mainstream beer as well as spirits" (EABL, 2014). Profits before tax fell a further 6 percent in 2014, but the dividend was pegged at the same level of KES5.50/share. This was still more than shareholders received before the success of Senator keg. Overall, therefore, EABL was able to weather the storm without great difficulty. And after the decision to impose excise duty on sorghum beer was reversed, shareholders were rewarded with a record dividend of KES12/share in 2016.

Smallholders were a weaker position. As demand from EABL dried up, they had no choice but to cut production. Growers first heard the news about the imposition of excise duty in the budget speech of June 5, 2013, well before the main planting season for sorghum in the short rains (October-December). However, they ignored the implications. The area planted to sorghum in Kitui county – the biggest producer – actually rose from 58,000 ha in 2012 to 76,000 ha in 2013 before falling back to 59,000 ha in 2014 (Ministry of Agriculture, Livestock and Fisheries, 2016). Alternative markets for sorghum in Kenya are limited. The livestock-feed industry relies on maize, which is cheaper. Flour processors require sorghum but not as much as the 12,000 t bought by EABL in 2012. Finally, smallholders in the semi-arid regions where sorghum is grown had few alternative cash crops.

Opposition to the excise duty was led by a national farmers' organization, the Cereal Growers Association (CGA). Besides its representative role, the CGA was implementing two donor-funded projects to increase sorghum production among 35,000 growers in semi-arid regions (Opiyo, 2014a). They formed a coalition to lobby for the remission of excise duty. Members of this coalition included the East African Grain Council (a regional trade association, which included grain processors) and an international NGO, the Alliance for a Green Revolution in Africa (AGRA)[16]. The CGA had the resources to commission a review by a respected think-tank, the Tegemeo Institute, which provided evidence on the income lost by farmers as well as the meager benefits for government revenue (Opiyo, 2014a). EABL does not seem to have been involved in this coalition directly, preferring to operate behind the scenes[17]. This coalition of farmers, processors, and NGO formed a powerful advocacy group which was hard for government to ignore.

By contrast, the government's case was not strong. First, there was hard evidence that the excise duty had not delivered the expected increase in tax revenue. Second, the negative impact on sorghum growers contradicted other policy objectives, including the agricultural policy to raise production in semi-arid regions (Mailu and Mulinge, 2016) and the Millennium Goal of poverty reduction. Finally, the tax was regressive, penalizing low-income consumers and potentially increasing the risks to public health from the consumption of *chang'aa*. In combination, these made the imposition of the excise duty hard to defend. On the other hand, the pressure to generate additional tax revenue had eased. Higher rates of economic growth after 2013 raised taxable incomes, while improved management raised tax collection (Booth *et al.*, 2014). This gave government greater room for manoeuver. Two years later, the government relented and removed the excise duty. The Alcoholic Drinks Control (Amendment) Act (May, 2015) replaced the excise duty of 50 percent for beer made from sorghum, millet and cassava, by a duty of just 10 percent, on condition that this was packed in kegs rather than in bottles[18].

Thus, the end result was a face-saving compromise that allowed both sides to claim victory. The excise duty on sorghum beer was reduced rather than eliminated, as EABL wanted. Consequently, sorghum beer would continue to contribute to government revenue, while the higher price of Senator keg would not deter consumers and allow sales to recover quickly. In fact, revenue from sales by EABL in 2016 were close to the levels reached in 2012. When government next raised excise duty in the budget of 2015, the burden fell on bottled beers and spirits rather than on Senator keg (EABL, 2016).

Conspicuously absent from this story of adaptation are the consumers – the *wananchi* or common man whose thirst had fueled the boom in sales of sorghum beer. They did not need any organization to make their voice heard. Their adaptation was straightforward: they simply walked away. There are plenty of other products to choose from. At the end of the day, the actors on the supply side of the value chain, and the government, were at the mercy of the consumer. Adaptation was their only option, because the market power of the bottom of the pyramid was simply too big and too lucrative to ignore.

4. Discussion

Viewed from the perspective of complex adaptive systems, the story of sorghum beer in Kenya raises some general issues about the performance of smallholder value chains. In this section, we reflect on three of these issues, setting them within a wider context.

The first issue is the nature of endogenous shocks. Unlike in Southern Africa, where government played a major role in opaque sorghum beer, brewing in Kenya was always a private enterprise (Partanen, 1991). The creation of the value chain for sorghum beer was based on a partnership between business and government. Indeed, the key partner was government. Without its agreement to first reduce and then to eliminate excise duty in order to make Senator keg competitive with *chang'aa*, sorghum beer was not commercially viable. The same was true for sorghum beer in Uganda, where EABL's competitor SABMiller had developed Eagle Lager, launched in 2002. As in Kenya, success relied critically on government support:

> Raw material inputs represent only about 15% of the retail selling price of beer and thus it is clear that even a drastic reduction in the cost of raw materials will not have a significant impact on the retail selling price if margins are to be maintained. The key success factor in a project of this nature, then, is to obtain a reduction in excise duty applicable to a product made from predominantly local raw materials and which could demonstrably contribute to economic development within the country (Mackintosh and Higgins, 2004, p. 238).

The value chain's dependence on what was effectively a state subsidy made it vulnerable to policy change. First of all, government support was not binding: what was given could also be taken away. EABL's initial agreement was with the government of Mwai Kibaki (2002-2007) but the government of Uhuru Kenyatta (2013-present) was not bound by this decision. Second, excise duty on alcohol was traditionally an important source of tax revenue. Across the region, this was set at high levels. This gave legitimacy to the government's decision to extend excise duty to sorghum beer. Third, policy is often a compromise between competing objectives. In this case, the government had to reconcile at least four policy objectives: finance (fiscal stability), public health (the threat from *chang'aa*), economics (growth of the value chain) and development (reducing poverty for smallholders). Priority-setting among these objectives reflects the relative power of different Ministries and the pressure of events on government. Fourth, there is the time-pressure on government to make quick decisions. The election was held on March 4, 2013, the new National Treasury Cabinet Secretary was appointed on 23rd April, and the budget speech that imposed excise duty was made on 13th June. For a new government with a myriad issues to consider, a space of just eight weeks left little time for consultation. Thus, the policy decision on excise duty came out of the blue. Finally, there is the fog of ignorance in which government operates. The career civil servants who made the decision to impose excise duty on sorghum beer were experienced economists[19]. But because EABL refused to disclose its revenue from Senator keg (Business Daily, 31 May, 2013), they had no idea how much the excise duty would reduce sales. On the other hand, they already knew that the excise duty on bottled beers was too high to maximize revenue (Karingi *et al.*, 2001). Thus, the decision to impose a 50 percent excise duty on sorghum beer was a leap in the dark. This uncertainty over the impact of policy decisions created additional uncertainty in the value chain.

A second general issue is the nature of adaptation in smallholder value chains. Clearly, the capacity for adaptation varied greatly between different value chain actors. Adaptation was relatively easy for EABL, a large, multinational company with income spread across three countries in the region and KES11 billion in assets (EABL, 2014). At the other extreme, the capacity for adaptation among 30,000 smallholders with few alternative markets for sorghum was limited. In a democracy where parties are not based on class interests but on ethnic rivalries, smallholders in Eastern Kenya were vulnerable to a change in regime. Defeated in the 2013 election, their political patrons were powerless to protect them. However, this asymmetry in adaptive capacity did not make smallholders passive victims. Through the CGA they were able to mobilize enough political support to have the decision overturned. The CGA is just one of a number of special-interest groups that have mushroomed in Kenya in the 1990s following market liberalization. By changing the institutional landscape, market liberalization has created a powerful counterweight to government's control over agricultural policy. However, if these interest groups are not consulted when policy is formulated, their power becomes evident only after policy has been made and its effects become clear. As a result, government policy tends to proceed by trial and error. This helps explain the policy U-turns that characterize policy making for smallholder agriculture in some developing countries (Harrigan, 2003). What appears as a lack of consistency is actually part of the process by which agricultural policy is made.

A general point here is the political role that farmer organizations can play in smallholder value chains. Typically, economists see this role in purely functional terms as providing scattered and physically isolated smallholders with services and access to markets. But they play multiple roles. Through its control of resources from donor projects, the GGA was a patron in their own right. This reinforced its interest in protecting the value chain. More generally, a political system that centers on ethnic rivalries creates the space for farmer organizations to play the role of political parties that represent economic interests. Obviously, such organizations represent smallholders with different levels of resources. But they can be effective in uniting these smallholders to protect a common interest and, in doing so, provide smallholders with a political voice. In protecting the value chain for sorghum beer, this role was critical.

A third and final general issue is the wider problem of uncertainty in smallholder value chains. Unlike risk, where the probability of a given outcome can be calculated, uncertainty refers to situations where the probability of a given outcome is unknown. In the case of sorghum beer, one major source of uncertainty is government policy. This reflects something more fundamental, namely the conflict between development and political objectives.

From the standpoint of development, the value chain for sorghum beer has great potential. Multinational breweries are searching for new markets as beer consumption falls in developed countries (Swinnen and Vandermoortele, 2011). Demand for beer in Africa is growing thanks to a large and expanding middle class. If we define "aspirational" consumers as those with an income of \$2-\$4 per day, the potential consumers of sorghum beer in Kenya numbered nine million and accounted for 22 percent of the total population (Lufumpa *et al.*, 2015). This growing middle class will fuel consumer demand for processed products. Unfortunately, we do not have projections for Kenya. But projections for three countries in the same region (Tanzania, Ethiopia, and Mozambique) suggest that by 2040 middle-class households with incomes of \$2-\$4 per day will account for 21 percent of consumer expenditure on food (Tschirley *et al.*, 2015). Kenya is already the third biggest market for beer in Africa (World Health Organization, 2011). Africans have long seen bottled beer as a badge of modernity (Willis, 2002; Partanen, 1991). As incomes rise, the next few decades will see growing numbers of middle-class consumers aspiring to buy products that match their new status.

Kenya's brewing industry is well placed to meet this demand. EABL enjoys a virtual monopoly of the beer market in Kenya, with a market share in 2011 of 83 percent[20]. EABL can also tap the regional market through its subsidiaries in Tanzania, Uganda, and South Sudan. The company has made strategic investments, selling off its minority share in Tanzania Breweries Limited, buying a controlling stake in Serengeti Breweries in Tanzania in 2010, and buying out SABMiller's remaining stake in KBL[21], as well as building capacity both in Kenya and across the region (EABL, 2011, 2012). Targeting consumers at "the bottom of the pyramid," in this case those living just above the poverty line, is viewed as a winning business strategy (Prahalad and Hart, 2002). Competition is fierce, however, and EABL's Senator keg must compete with SABMiller's Eagle Lager, a sorghum beer popular in Tanzania and Zambia (Inspiris Limited, 2006). Investment in sorghum beer can have powerful multiplier effects. An evaluation of the economic impact of Eagle Lager in Uganda estimated benefits to the economy of USD 92 million (Kapstein *et al.*, 2009). From a development perspective, therefore, the development of the value chain for sorghum beer is a win-win scenario: higher incomes for farmers, bigger sales for EABL, cheaper, safer beer for ordinary Kenyans, and more tax revenue for government.

Will this development potential be realized? In a "developmental state" on the East Asian model, the answer would be an unequivocal Yes. In Kenya, however, the answer is less certain. This uncertainty surrounding the future trajectory of the value chain stems from the nature of politics in Kenya. As political scientists have pointed out:

> Five to six moderately large [ethnic] blocs make up a large share of the total. To construct a winning coalition, it is only necessary to attract the leaders of two or three of those blocs. This creates the virtual certainty that the outcome of an election will exclude at least one or two substantial ethno-regional groups from participation in government. This raises the stakes to a very high level […]. Presidents and governments cannot afford to govern in the national interest, lest they undermine the sectional support on which their re-election depends (Booth and Golooba-Mutebi, 2014, p. 18).

Thus, the source of uncertainty in the value chain for clear sorghum beer in Kenya lies in the political structure. Resolving this uncertainty will require changing this structure through the development of new institutions – a new "political settlement" – that will allow government to follow national as opposed to sectional interests (Booth and Golooba-Mutebi, 2014). This does not mean that the value chain is doomed to fail. As we have seen, it has proved extremely resilient. But it does suggest that (as in 1992 and 2013) its future trajectory may be interrupted by sudden, endogenous shocks, disputes between interacting agents, and adaptation as government coalitions change and as development objectives are sacrificed to short-term political advantage. Our analogy with the fable of the goose that laid the golden eggs is based on the premise that the government wished to optimize short-term revenue. But if the objective is not economic but political – to inflict damage on political opponents – then our analogy is based on a false premise. In a political system based on the principle of "it's our turn to eat," the winner takes all – and the losers go hungry (Wrong, 2009).

5. Conclusion

The micro-history of a single policy decision can teach us useful lessons about smallholder value chains. Sorghum beer is a case in point. We conclude by summarizing three lessons that have emerged from our analysis.

The story of clear sorghum beer in Kenya shows the importance of contextual factors in explaining the behavior of smallholder value chains. The importance of these factors is easily overlooked by conventional value chain guides, which take the context as given. In the case of sorghum beer, however, the context is central to the story. This value chain reflects the close relationship between business and politics in Kenya. Sorghum beer was conceived not just as a commercial opportunity but as an instrument of social control. Commercial success was conditional on political support. However, this made the value chain vulnerable to changes in political regime. The success of sorghum beer in Kenya rested on fragile foundations that could crumble overnight if the government changed its mind. The general point here is that smallholder value chains where there are close links between business and politics face a high risk of endogenous shocks. The brewing industry is a prime example. Because of the importance of alcohol to government both for revenue and for social control, the price of beer is a barometer for this relationship. This political dimension creates an additional source of uncertainty in the value chain. Furthermore, the political system in Kenya – a neo-patrimonial state based on ethnic rivalries – makes the relationship between business and politics unstable. In particular, transitions from one regime to another can be hazardous for any business that supports the wrong side. The result is to create uncertainty in any value chain whose development relies on the government's continuous support.

Smallholder value chains can adapt to sudden, endogenous shocks, but this requires organizational capacity and skills. In the case of sorghum beer, resistance to government policy was led by a national farmer's organization that had a vested interest in the value chain and the ability to form and lead a coalition of stakeholders that succeeded in having the change in policy reversed. Adaptation therefore requires that smallholders are represented at the national level by organizations whose power is recognized. Without such organizations to give them a political voice and mobilize support from other stakeholders, smallholders have little chance of influencing policy. This reinforces the need to strengthen capacity in farmer organizations to identify potential threats and develop adaptive strategies, including the need for stronger communication with government on the impact of specific policy choices on smallholders.

Framing the story in terms of complex systems helps capture the inner dynamics of smallholder value chains. In particular, it focuses attention on the agendas of different value chain actors, how far these agendas overlap, and potential sources of conflict between them. Although the agendas of smallholders, EABL, and government were initially in close agreement, they changed over time. The agenda for government shifted from public health to revenue, which prompted the hike in excise duty. By contrast, the agenda for EABL was the same throughout, namely to make a profit from consumers at the bottom of the pyramid. When this strategy ran into difficulties EABL did not hesitate to switch products from sorghum beer to cheap spirits. Only when the agendas of government and EABL coincide will smallholders in Kenya continue to benefit from the value chain for sorghum beer.

Notes

1. The decision to declare home-brewed beer illegal was not motivated by the desire to increase government revenue, but simply by President Moi's personal aversion to alcohol (Haugerud, 1995, p. 86).
2. Unlike in South Africa, Rhodesia and Botswana (Rogerson and Tucker, 1985; Haggblade, 1992) the commercial brewing of opaque sorghum beer (*chibuku*) was never industrialized in Kenya.
3. Hustlers now mourn tax hike on Senator Keg in the 2013/2014 Kenya Budget, *Standard Digital*, June 15, 2013.
4. "EABL stops daily brewing as growth hits a four-year low," *Business Daily*, March 13, 2014.
5. "Kenya: return of SABMiller Stirs New Beer Wars" March 28, 2011, available at http://allafrica.com/stories/201103290088.html

6. Poisoning from *chang'aa* resulted from adulteration with jet fuel, methanol, battery acid, and embalming fluid. Less lethal ingredients reportedly included decomposing rats and women's underpants. "Kill me quick: Kenya's lethal brew deserves its name." *The Economist*, April 29, 2010. For the early history of *chang'aa*, see de Smedt (2009).
7. Once more illustrating the close ties between government and business, the parliamentary motion to ban "power drinks" was brought by John Michuki, an MP who had held a beer distributorship for Kenya Breweries Limited since the 1960s (Willis, 2003, p. 251).
8. EABL sees sales drop after new tax measures on Senator Keg, *Business Daily*, January 23, 2014.
9. The first commercial producer of sorghum clear beer was Nigerian Breweries Limited, a member of the Heineken group, which started production in 1988 following the decision by the Government of Nigeria to ban the import of barley malt.
10. Senator became known as "Obama" beer since the launch in 2004 coincided with Barack Obama's election as Senator for Illinois in January 2005. His father, Barack Obama Sr, was born in Siaya district, Kenya, and a Luo, available at: http://news.bbc.co.uk/1/hi/world/africa/7251273.stm
11. Packaging costs account for up to 60 percent of beer production costs.
12. "EABL sees sales drop after new tax measures on Senator Keg," *Business Daily*, January 23, 2014.
13. Budget Speech June 13, 2013, paragraph 78, available at: http://www.citizennews.co.ke/news/2012/local/item/11232-budget-2013-2014-speech-by-henry-rotich
14. EABL claimed that by 2008 Senator Keg had "wrested 44% of the informal alcohol market" (EABL, 2013).
15. "EABL targets Senator Market with Sh10 spirit", *Business Daily*, November 5, 2014.
16. "Grain value chain/Kenya – a collective win for sorghum value chain actors", August 5, 2015, available at: http://agritrade.cta.int/en/Agriculture/Commodities/Cereals/Grain-value-chain-Kenya-A-collective-win-for-sorghum-value-chain-actors
17. A former President of AGRA, Jane Karuku, had joined the EABL Board of Directors in September 2013 and subsequently became Managing Director of KBL in 2015 (EABL, 2014, annual report).
18. "Uhuru signs into law Bills on beer, domestic violence, public service", *Business Daily,* May 15, 2015.
19. Henry Rotich, the National Treasury Cabinet Secretary, who presented the budget, had been Head of Macroeconomics at the Treasury, since 2006; Joseph Kinyua, the Permanent Secretary to the Treasury, Ministry of Finance, and Mutua Kilaka, Financial Secretary at the Ministry of Finance. All three were trained economists. Details available at: http://treasury.go.ke/index.php/aboutus/senior-management/
20. "Kenya is Africa's third Largest Beer Market", available at: https://abacus.co.ke/kenya-is-africas-third-largest-beer-market/
21. "Diageo buys out Kenya Breweries" Brewers Guardian.com, June 7, 2011, available at: www.brewersguardian.com/brewing-features/international/995.html

References

African Business (2012), "Africa's top companies", No. 385, April, pp. 16-24.

Ambler, C.H. (1991), "Drunks, brewers, and chiefs: alcohol regulation in colonial kenya, 1900-1939", in Barrows, S. and Brown, R. (Eds), *Drinking, Behavior and Belief in Modern History*, University of California Press, Berkeley, CA, pp. 165-183.

Bodewes, C. (2010), "*Chang'aa* drinking in Kibera slum: the harmful effects of contemporary changes in the production and consumption of traditional spirits", *African Journal of Drug & Alcohol Studies*, Vol. 9 No. 1, pp. 49-55.

Booth, D., Cooksey, B., Golooba-Mutebi, N.F. and Kanyinga, K. (2014), "East African prospects: an update on the political economy of Kenya, Rwanda, Tanzania and Uganda", Overseas Development Institute, London.

Booth, D. and Golooba-Mutebi, F. (2014), "How the international system hinders the consolidation of developmental regimes in Africa", Developmental Regimes in Africa, Working Paper No. 4, Overseas Development Institute, London.

Bryceson, D.I. (2002), "Changing modalities of alcohol usage", in Bryceson, D.I. (Eds), *Alcohol in Africa: Mixing Business, Pleasure, and Politics*, Heinemann, Portsmouth, pp. 23-52.

De Smedt, J. (2009), " 'Kill me quick': a history of Nubian Gin in Kibera", *International Journal of African Historical Studies*, Vol. 42 No. 2, pp. 201-220.

Dundas, C. (1913), "History of Kitui", *Journal of the Royal Anthropological Institute of Great Britain and Ireland*, Vol. 43, July-December, pp. 480-549.

East African Breweries Limited (EABL) (2013), "How an elephant learned to dance: the senator story", available at: http://m.eabl.com/downloads/The-Senator-Story.pdf

East African Breweries Limited (EABL) (1978-1984, 2014, 2015, 2016), "Annual reports", East African Breweries Limited, Nairobi.

Haggblade, S. (1992), "The shebeen queen and the evolution of Botswana's sorghum beer industry", in Crush, J. and Ambler, C. (Eds), *Liquor and Labor in Southern Africa*, Ohio University Press, OH, pp. 395-412.

Harrigan, J. (2003), "U-Turns and full circles: two decades of agricultural reform in Malawi 1981-2000", *World Development*, Vol. 31 No. 5, pp. 847-863.

Haugerud, A. (1995), *The Culture of Politics in Modern Kenya*, Cambridge University Press, Cambridge.

Hornsby, C. (2013), *Kenya: A History since Independence*, I.B. Taurus, London.

Inspiris Limited (2006), *Bottling Success: The Case of Eagle Lager in Uganda and Zambia*, Inspiris Limited, Lusaka.

Kanter, R.M. and Bird, M. (2009), "Diageo and East African Breweries Ltd: trading new markets for social good", Case Centre Report No. 9-310-010, Mimeo, Babson, MA, 23pp.

Kapstein, N., Kim, R. and Ruster, W. (2009), "The socio-economic impact of Nile Breweries in Uganda and Cerveceria Hondurena in Honduras", Mimeo, London, 17pp.

Karingi, S.N., Kimenyi, M.S. and Ndung'u, N.S. (2001), "Beer taxation in Kenya: an assessment", KIPRA Discussion Paper No. 6, Kenya Institute for Public Policy Research and Analysis, Mimeo, Nairobi, 30pp.

Kenya National Bureau of Statistics (1960-2016), *Statistical Abstracts*, Kenya National Bureau of Statistics, Nairobi.

Lindblom, G. (1920/1969), *The Akamba in British East Africa. An Ethnological Monograph*, 2nd ed., Negro Universities Press, New York, NY.

Lufumpa, C.L., Mubila, M. and Ben Aissa, M.S. (2015), "The dynamics of the middle class in Africa", in Ncube, M. and Lufumpa, C.L. (Eds), *The Emerging Middle Class in Africa*, Routledge, London, pp. 9-33.

Mackintosh, I. and Higgins, B. (2004), "The development of a sorghum-based lager beer in Uganda: a model of cooperation between industry and government in the development of local ingredients for the production of a quality lager beer and consequential benefits for all parties involved", *Aspects of Applied Biology*, Vol. 72, pp. 235-245.

Mailu, S.K. and Mulinge, W. (2016), "Excise tax changes and their impact on sorghum demand in Kenya", paper presented at the Fifth International Conference of African Agricultural Economists, Addis Ababa, September 23-26, available at: http://ageconsearch.umn.edu/bitstream/246959/2/294.%20Excise%20taxes%20in%20Kenya.pdf

Ministry of Agriculture, Livestock and Fisheries (2016), "Economic review of agriculture (ERA), 2015", Central Planning and Project Monitoring Unit, Ministry of Agriculture, Livestock and Fisheries, Nairobi.

Mitchell, M. (2009), *Complexity: A Guided Tour*, Oxford University Press, Oxford.

Mutisya, D. and Willis, J. (2009), "Budget drinking: alcohol consumption in two Kenyan towns", *Journal of Eastern African Studies*, Vol. 3 No. 1, pp. 55-73.

Mwega, F.M. and Ndung'u, N.S. (2008), "Explaining African economic growth performance: the case of Kenya", in Ndulu, B.J., O'connell, S. A., Azam, J.-P., Baker, R.H., Fosu, A.K., Gunning, J.W. and Njinkeu, J. (Eds), *The Political Economy of Economic Growth in Africa, 1960-2000*, Vol. 2 Country Case Studies, Cambridge University Press, Cambridge, pp. 325-368.

Nout, M.J.R. (1981), "Aspects of the manufacture and consumption of Kenyan traditional fermented beverages", unpublished PhD thesis, University of Wageningen, Wageningen.

Ogola, F.G.O. and Mungai, E. (2011b), "Corporate social innovation in East African Breweries Ltd (EABL): the launch of senator", Case Centre Report No. 711-008-1, Mimeo, Babson, MA, 14pp.

Opiyo, J. (2014a), "Effect of excise duty on sorghum beer and implication on welfare of sorghum growers", Tegemeo Institute of Agricultural Policy and Development, Egerton University, Mimeo, 23pp.

Orr, A., Donovan, J. and Stoian, D. (2018), "Smallholder value chains as complex adaptive systems: a conceptual framework", *Journal of Agribusiness in Developing and Emerging Economies*, Vol. 8 No. 1, pp. 1-21.

Orr, A., Mwema, C. and Mulinge, W. (2014), "The value chain for sorghum beer in Kenya", Socioeconomics Discussion Paper Series No. 16, International Crops Research Institute for the Semi-Arid Tropics, Patancheru, available at: http://oar.icrisat.org/7840/1/SDPS_16.pdf

Partanen, J. (1991), "Sociability and intoxication: alcohol and drinking in Kenya, Africa, and the Modern World", Finnish Foundation for Alcohol Studies, Helsinki.

Poulton, C. and Kanyinga., K. (2014), "The politics of re-vitalising agriculture in Kenya", *Development Policy Review*, Vol. 32 No. 2, pp. 151-172.

Prahalad, C.K. and Hart, S.L. (2002), "The fortune at the bottom of the pyramid", *Strategy + Business*, Vol. 26 No. 1, pp. 1-16.

Roberts, B.D. (2000), "Always cheaply pleasant: beer as a commodity in a Rural Kenyan Society", in Haugerud, A., Shore, M.P. and Little, P.D. (Eds), *Commodities and Globalization: Anthropological Perspectives*, Rowland and Littlefield Publishing Inc., Lanham, MD, pp. 179-196.

Rodwell, E. (1982), *Sixty Years of Kenya Breweries*, Durnford Hall & Partners, Nairobi.

Rogerson, C.M. and Tucker, B.A. (1985), "Commercialisation and corporate capital in the sorghum beer industry of Central Africa", *Geoforum*, Vol. 16 No. 4, pp. 357-368.

Swainson, N. (1980), *The Development of Corporate Capitalism in Kenya, 1918-1977*, Heinemann Educational Books Ltd, London.

Swinnen, J.F.M. and Vandermoortele, T. (2011), "Beeronomics: the economics of beer and brewing", in Swinnen, J.F.M. (Ed.), *The Economics of Beer*, Oxford University Press, Oxford, pp. 335-356.

Tschirley, D., Reardon, T., Dolislager, M. and Snyder, J. (2015), "The rise of a middle class in East and Southern Africa: implications for food system transformation", *Journal of International Development*, Vol. 27 No. 5, pp. 628-646.

Van Wijk, J. and Kwakkenbos, H. (2011), "Beer multinationals supporting Africa's development? How partnerships include smallholders into sorghum-beer supply chains", in Van Dijk, M.P. and Trienekens, J. (Eds), *Promoting Sustainable Value Chains: The Role of Governance*, Amsterdam University Press, Amsterdam, pp. 71-88.

Willis, J. (2002), *Potent Brews: A Social History of Alcohol in East Africa, 1850-1999*, James Currey Limited, Oxford.

Willis, J. (2003), "New generation drinking: the uncertain boundaries of criminal enterprise in Modern Kenya", *African Affairs*, Vol. 102 No. 407, pp. 241-260.

World Bank (2014), *Take-Off Delayed?*, Kenya Economic Update Edition No. 10, The World Bank, Washington, DC, June.

World Health Organization (2011), "Global status report on alcohol and health", World Health Organization, Geneva.

Wrong, M. (2009), *It's Our Turn to Eat: The Story of a Kenyan Whistleblower*, Harper Perennial, New York, NY.

Further reading

Diageo Plc (2011), "Generating prosperity through doing good business in Africa", available at: www.diageo.com/Lists/…/1078/CSR%20Africa%20Report_web.pdf (accessed February 10, 2017).

Opiyo, J. (2014b), "Implication of excise duty on sorghum value chain", Policy Brief No. 16, Tegemeo Institute of Agricultural Policy and Development, Egerton University, Nairobi.

Ogola, F.G.O. and Mungai, E. (2011a), "Corporate social innovation in East African Breweries Ltd (EABL): Senator Keg", Case Centre Report No. 711-020-1, Mimeo, Babson, MA, 11pp.

Okello, A.K. (2001), "An analysis of excise taxation in Kenya", African Economic Policy Discussion Paper No. 73, Equity and Growth through Economic Research. Mimeo, Alexandria, VA, 28pp.

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