Effect of Sweet Potato Market Conduct on the Nexus Between Sweet Potato Market Structure and Market Performance in Kenya

Alphonce Odondo[1]

Abstract: Kenya's sweet potato industry yields an average of 8.2 tons per hectare against her potential of 50 tons per hectare. This dismal performance is partly ascribed to paucity of market information which the current study sought to address through Hierarchical multiple regression model anchored on the Structure Conduct Performance (SCP) paradigm. The study revealed that market share, market concentration, entry barriers and product differentiation had significant positive effects on sweet potato market performance. Market conduct significantly moderated the strength of the relationship between entry barriers and market performance. Thus, conduct of market players should be checked to minimize activities that enhance sweet potato market inefficiencies.

Keywords: sweet potato; market conduct; market structure; market performance; Kenya

1. Introduction

1.1. Background

According to Cassey (2007), market structure denotes the variables that are fairly stable over time and affect the conduct of firms in an industry. Such variables include but not limited to: barriers to entry into a market, product differentiation and market concentration (Odondo, 2023; Odondo, Mukras & Momanyi, 2013; Cassey, 2007; Lipczynski et al., 2013). Market conduct on the other hand refers to the manner in which sellers behave amongst themselves and it depicts the competitiveness of a market. From the theory of industrial organization, its measurable dimensions include research and development, pricing collusion, advertising and inter-firm-coordination. Market performance is the outcome of the market structure and market conduct (Ngigi, 2008). The three concepts ore their origin to the structure, conduct and performance (SCP) model that can be traced to the works of 1930s Harvard economists Edward Mason and Edward Chamberlin (Cassey, 2007). The SCP paradigm pervaded empirical studies in industrial economics between 1950s and 1980s and has been extensively used as a

---

[1] PhD, Tom Mboya University, Homa Bay, Kenya, Address: P.O. Box 199-40300, Homa Bay, Kenya, Corresponding author: alphonceodondo@gmail.com.

means of classification of markets and as a framework for analysing performance of industries in economics. Chamberlin in Cassey (2007) argues that pragmatic analysis is crucial because theories are based on mathematical constructs whose relevance cannot be established without empirical observations.

Numerous empirical studies in economics have since then focused on the elements of the SCP model to understand characteristics of various industries. A sizable number of existing studies on the dimensions of the SCP model have yielded differing results. For instance, a study by Goldschmidt et al. (1974) on the effect of price-cost margins on a 4-firm concentration in the United States of America industry, revealed that market concentration had a small, but significant effect on price-cost margins. VanHoose (2009) in his study of the Bank Behaviour, Market Structure, and Regulation in Berlin Heidelberg observed that high market power of a single producer or a few producers, may enable a firm to set higher prices hence more profits. In the United Kingdom, albeit Lyons (1981) revealed a significant positive relationship between market concentration and price cost margins, Geroski (1981) revealed conflicting results. He asserted that market concentration had both positive and negative effects on price-cost margins over several concentration ranges. Such conflicting results suggest that every market may have its unique characteristics which are likely to impact on its performance (Odondo, 2023). Information on market characteristics and their relationship with performance is generally important for policy formulation and implementation at the firm and at the industry level.

In sub-Saharan Africa for instance, it is argued that the growth of sweet potato industry is constrained by lack of dependable information on sweet potato market structural characteristics (CIP, 2009). Kenya is the seventh largest sweet potato producer in Africa with an average yield of 8.2 tonnes/ha (FAO, 2003) against a potential of 50 tonnes/ha (FAO, 2002). The Government of Kenya has put efforts through the ministry of Agriculture by introducing new sweet potato varieties and training farmers on how to reduce post-harvest losses. This resulted in increased national sweet potato output from 400 metric tons in 2010 to 690 metric tons in 2011, a 72% increase (Andea, 2012).

Sweet potato (Ipomea batatas L) is increasingly becoming an important food security and famine relief crop during seasons of crop failure (CIP, 1998; Nungo et al., 2007; Kibwage et al., 2009). In Kenya, it is grown in continuous cycles partly because of the piecemeal harvesting of tubers which commonly extends its season (Kapinga et al., 1995). The crop is essentially grown for its tuberous storage roots, which are commonly steamed or boiled (Carey et al., 1997). The roots provide energy, proteins, vitamins A (particularly in orange fleshed sweet potato varieties), B1 and B2, ascorbic acid and folic acid in diets. Other important nutrients in sweet potato roots are calcium, phosphorous, sodium, iron and potassium (Woolfe, 1992). Young sweet potato leaves are also consumed as vegetables in some countries and are rich in vitamins A, B1, B2, proteins and iron (Woolfe, 1992). Generally, the storage roots of sweet potato and foliage are also important supplementary fodder in livestock production. Hence, sweet potato plays a vital role in ensuring food security, especially during drought in large parts of Africa (CIP, 1998).

According to USAID in Andea (2012), sweet potato global market is growing every year, presenting opportunities for export and for subsistence farmers not only to improve their food security situation but also boost income from the sales of surplus. Exporting surpluses may greatly benefit the market players especially where market inefficiencies are minimized through interventions like market liberalization. Jayanthakumara cited in APEC (2008) asserted that market liberalization is one of the ways through which developing economies can benefit from burgeoning global markets. He argues that trade

liberalization opens up markets and promotes exports through the operations of comparative advantage. Domestic price disciplining and removal of excess profits earned by domestic firms with market power operating in oligopolistic markets are done by subjecting domestic markets to external competition. Enhanced competition removes inefficiencies which in turn enhances productivity according to Verdoon's law (APEC, 2008).

However, if liberalization is not managed, it may lead to large firms establishing themselves as oligopoly or even monopolies in the newly liberalized market. Because of market dominance, such firms may behave against competitive practices which may subsequently distort the markets (APEC, 2008). In Africa for instance, after independence, most governments continued the policies of tight market controls that were put in place by colonial governments in order to protect farmers from exploitation by other marketing agents and stabilize market prices. However, over time, it became overt that the removal of market forces and reliance on such bureaucracies was not an efficient way to harmonize supply and demand, and the system became increasingly inefficient as indicated by serious economic imbalances, volatile and unpredictable food crop prices among others (Thomas, 2006).

From the foregoing discussion, it is clear that information on various market aspects is inevitable for the success of an industry to be realized. Notwithstanding the need for information in the sweet potato industry, the underscored conflicting results on some of the aspects of the SCP model points to the possibility of a moderator between the market structure and market performance. The current study, therefore, seeks to fill the information gap by assessing the effect of sweet potato market conduct on the relationship between sweet potato market structure and performance in Kenya.

1.2. Theoretical Framework

This study was based on the theory of Industrial Organization (IO) that deals with the structure of industries in an economy and the behaviour of firms in those industries. The theory has been largely used in industrial economics and business management (Tesfaye & Abdurezak, 2018). From the theory, the interrelationship between the Structure, Conduct and Performance (SCP) is drawn. The SCP paradigm was the brain child of the Harvard school of thought and was popularized during 1940-60 with its empirical work involving the identification of correlations between industry structure and performance (Seanicaa et al., 2006; Odondo et al., 2014). The paradigm serves as a concession between formal structures of neo-classical economic theory (e.g., perfect competition, monopoly, monopolistic competition and oligopoly) and empirical structures of organizational experience in imperfect markets (Harris, 1993; Byaruhanga, 2002). The general approach in this model has been to identify and specify the chains linking dimensions of market structure and those of market conduct and industrial performance. New developments in industrial economics have highlighted the possibility of feedback effects. For example, it can be argued that advertising as an item of business conduct can significantly affect elements of market structure such as barriers to entry into the market and the market concentration (Ngigi, 2008).

The paradigm hypotheses that profit margins tend to be higher in those markets where entry barriers are higher and that technological progressiveness and cost efficiency are lower in the markets where seller concentration and barriers to entry are higher as competition will be less stiff. Higher market concentration results in high prices and profits, a likely indication of market power operation to the

detriment of social welfare (Lipczynski et al., 2013; Shafer, 2004). In this study, the paradigm helped in understanding how sweet potato sellers behave and perform given the constraints within the commodity's supply chain.

2. Research Methodology

2.1. Research Design

The study was based on positivists approach (Positivism-paradigm). Positivism is associated with quantitative research and involves hypothesis testing to obtain "objective" truth that can be used to predict what may happen at a future date (Rossman & Rollis, 2003). Based on the approach, the study adopted correlational research design that helped in advancing the understanding of relationships among the market dimensions.

2.2. Study Area

Kenya's Economy is basically dependent on agricultural production. This study focused on Rachuonyo South District of Kenya where sweet potato production, processing and marketing were common. The region lies between longitudes 34˚25 and 35˚0 East and latitudes 0˚15 and 0˚45 south. Sweet potatoes produced in the region are old locally in the district and to other market outlets such as Ahero town, Nakuru town and Nairobi city.

2.3. Data Sources and Data Collection Methods

Both primary and secondary data were collected on aspects of sweet potato market in the area. Primary data were collected using closed and open-ended questionnaires as well as interview schedules. To avoid misinterpretation of the questions by respondents, the researcher administered the questionnaires with the help of a team of locally trained research assistants who also served as interpreters. Secondary information was obtained from: farmers, retailers, and wholesalers' records, annual district agricultural reports, statistical abstracts, periodicals, journals, economic reviews and market reports from the municipal council.

Profitability was used as a proxy for firm performance and was measured in terms of gross profit margin per year using the formula specified as:

$$Gross\ profit\ margin\ (P) = \frac{Gross\ profit}{Revenue} * 100 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. Equation\ 1$$

Where: Gross Profit = Revenue – Cost of sweet potatoes Sold

Market share was computed in terms of annual percentage contribution of a market player to the total market sales using Equation 2 below.

$$Market\ Share\ (MS) = \frac{A\ firm's\ sales}{Total\ industry\ sales} * 100 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. ...Equation\ 2$$

Where: A firm = An individual sweet potatoes seller

An industry = A collection of sweet potatoes sellers

Market conduct, market concentration, barriers to entry into the market, and product differentiation were measured on an ordinal scale as responded by the interviewees.

2.4. Sampling Procedure

The sampling frame was a list of 166 farmers registered by the department of social services as commercial sweet potato growers; 55 wholesalers and an infinite number of retailers though estimated to be more than 10,000. From the sampling frame, the most conservative sample size for the sweet potato farmers was determined at 95% confidence level using Kothari's (2010) formula given as:

$$n = \frac{Z^2 P. Q. N}{e^2(N-1) + Z^2 * P * Q} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots Equation\ 3$$

Where: n = sample size

z = standard variate at a given confidence level

Q = sample proportion of successes, Q = 1-P,

N = Size of population,

e = acceptable error (precision)

Hence, the most conservative number of farmers to be interviewed was:

$$n = \frac{1.96^2(0.5) * (0.5) * 166}{0.5^2(166-1) + 1.96^2 * (0.5) * (0.5)} = 116.1238 \approx 116\ Farmers$$

For the infinite population of retailers, the following Fischer formula cited in Mugenda and Mugenda (2003) was used:

$$n = \frac{Z^2 * P * Q}{e^2} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots Equation\ 4$$

Where: n = desired sample size,

z = standard normal deviation at 95% confidence level,

P = proportion in target population with characteristics being used,

Q = 1-p, implying proportion in target population without characteristics being used

e = acceptable error (precision)

The value of "P" recommended by Fisher is 50%.

Since the population of retailers was infinite although approximately more than ten thousand (10,000), the recommended sample size of the retailers was thus:

$$n = \frac{1.96^2 * (0.5)(0.5)}{0.5^2} = 384\ Retailers$$

Fifty (50) out of the 55 wholesalers were involved in the actual data collection exercise because five (5) of them participated in the questionnaires pretesting. Individual farmers and retailers were selected using simple random sampling (SRS) technique. This technique gives each element of the target population an equal chance of being selected (Babbie, 1989).

2.5. Model Specification

To address the study objective, the following models were estimated:

$$p_i = \beta_0 + \beta_1 MS_i + \beta_2 EB_i + \beta_3 MC_i + \beta_4 PD_i + \varepsilon_1 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots Equation\ \ 5$$

$$p_i = \beta_0 + \beta_1 MS_i + \beta_2 EB_i + \beta_3 MC_i + \beta_4 PD_i + \beta_5 CN_i + \varepsilon_1 \dots\dots\dots\dots\dots\dots Equation\ \ 6$$

Where:

MC = Market Conduct,

MS = Market Share,

MC = Market Concentration,

EB =Entry Barrier,

PD = Product Differentiation

CN = Market Conduct

P = Performance represented by Profitability

i = individual respondent

$$p_i = \beta_0 + \beta_1 MS_i + \beta_2 EB_i + \beta_3 MC_i + \beta_4 PD_i$$
$$+ \beta_5 CN_i + \sum_{j=1}^{4} \alpha_j CN_i * X_{ij} + \varepsilon_1 \dots\dots\dots\dots\dots\dots. Equation\ 7$$

Where: X denotes the measures of market structure i.e. Market Share, Market Concentration, Entry Barrier, and Product Differentiation.

$$CN_i * X_{ij} = Interaction\ term$$

$$\forall i = 1,2,3 \dots 421$$

$$j = 1,2,3,4$$

The total number of questionnaires duly filled were 421 out of the expected 550 respondents (i.e 50 wholesalers, 116 farmers and 384 retailers) representing 76.55% response rate. According to Babbie (2010), a response rate of 70% or more is very good for social science research.

2.6. Data Analysis

Hierarchical regression models were estimated as depicted in Equations 5, 6 and 7. These models helped to determine the possible indirect relationship where market structure influences market performance through market conduct and the possibility of direct effect of market structure on market performance being influenced by market conduct. Pearson correlation was used to establish bivariate association between the study variables. Multicollinearity was tested by computing the variance of inflation factors (VIFs) presented in Table 4. The VIFs fell within the threshold of 10, suggesting absence of severe multicollinearity (Gujarati, 2004). According to Pindyck and Rubinfeld (1998), if multicollinearity is not severe, a do nothing approach can be adopted instead of dropping a variable of interest in a given model.

3. Results and Discussions

Table 1 shows that all the explanatory variables had significant positive association with sweet potato market performance. The positive correlation between market conduct and performance ($r = 0.468$, $p < 0.001$) suggests that as market conduct improves (i.e. competitive behavior of sellers, fair market practices and ethical dealings), *ceterisparibus,* performance tends to improve. Similarly, the statistically significant, weak positive association ($r = 0.272$, $p < 0.001$) between market share and market performance, suggests that while larger market share is related to higher performance, other factors beyond market share are likely to play a stronger role in determining sweet potato market performance. Economists generally believe that higher market share leads to more profits. However, new developments in industrial economics suggest that the relationship between market share and profitability depends on competitive and strategic context (Ritz, 2008). The significant positive association between market share and profitability could be due to the efforts by market players to form groups and societies aimed at enhancing their bargaining power on pricing of the sweet potatoes. This concurs with (Odondo, Mukras & Momanyi, 2013) who noted that sweet potato farmers formed societies and farmers' groups aimed at addressing their sweet potato market related challenges among other market constraints.

Market conduct deals with the actual behaviour of firms in a market and how the firms react to the conditions created by the market structure and interacts with business rivals (Kai-Yu & Freek, 2003). Such behaviour includes but not limited to competition or collusion among the firms, inter-firm-coordination and pricing behaviour (Nambiro et al., 2001). The positive association between sweet potato market conduct and profitability is a likely indicator of competitive behaviour of the market players which significantly impacts on their performance. Market concentration on the other hand had $r = 0.311$, $p < 0.001$ suggesting that as market concentration (i.e., fewer firms dominating the market) increases, market performance tends to improve significantly. Barriers to entry into the market and product differentiation had $r = 0.234$, $p < 0.001$, and $r = 0.261$, $p < 0.001$ respectively, a likely indication that as barriers to entry into the market increase, performance of existing firms also tend to improve significantly. Sweet potato sellers that differentiate their products also tend to achieve better performance. The study findings are in tandem with Byaruhanga (2002) who although looked at the fish industry in Kenya, established a positive association between market concentration and firm profits, a likely indicator of market power that tends to depress social welfare. Positive association between

market concentrated and profit margins was also established by Maman et al. (2012) who assessed the relationship between concentration and price-cost margin in the Indonesian food and beverage sector. Conversely, Geroski (1981) observed that market concentration had both positive and negative effects on price-cost margins over several concentration ranges. High profit rates earned by individual firms could be ascribed to high levels of product differentiation, which may enable firms to obtain market protection for their products (Church & Ware, 2000). In Rachuonyo region, Odondo (2023) alluded to the existence of some aspects of sweet potato differentiation. The positive association therefore, suggests that sweet potato differentiation is important in decision making for better financial returns. In addition, demand for sweet potato, to a considerable extent depends on the type of sweet potato in the market (Mukras, Odondo & Momanyi, 2013).

Table 1. Correlation matrix for the study variables

		Profitability	Market Conduct	Market Share	Market Concentration	Entry Barrier	Prod. Differentiation
Profitability	Pearson Correlation	1					
	Sig. (2-tailed)						
Market Conduct	Pearson Correlation	.468**	1				
	Sig. (2-tailed)	.000					
Market Share	Pearson Correlation	.272**	.255**	1			
	Sig. (2-tailed)	.000	.000				
Market Concentration	Pearson Correlation	.311**	.407**	.234**	1		
	Sig. (2-tailed)	.000	.000	.000			
Entry Barrier	Pearson Correlation	.234**	.208**	.267**	.209**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
Product Differentiation	Pearson Correlation	.261**	.312**	.111*	.085	.166**	1
	Sig. (2-tailed)	.000	.000	.022	.082	.001	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

As indicated in the methodology section, a moderated multiple regression model was estimated to test the moderating effect of the sweet potato market conduct on the relationship between the market structure and performance. Table 2 shows that the explanatory power of model 1 was 0.196 implying that 19.6% changes in profitability was jointly explained by the four dimensions of sweet potato market structure. When market structure was entered into the model, the explanatory power improved to 0.277, suggesting that the five explanatory variables accounted for 27.7% changes in the firm profitability. When the interaction terms were introduced, the explanatory power increased to 0.29. While the R-

square changes associated with the first two models are statistically significant at p < 0.001, the R-square change (0.013) linked to the moderator is insignificant at p > 0.05. This suggests that, overall, when all the measures of sweet potato market structure (market share, product differentiation, market concentration, and entry barriers) are considered together, sweet potato market conduct does not moderate the direct relationship between market structure and market performance. However, there remains the possibility that market conduct moderates the relationship between individual measures and performance as opined in the theory of industrial organization.

Table 2. Model Summary

Model	R	R Square	Adj R Square	Std. Error of Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
						Change Statistics				
1	.443a	.196	.188	.8391084	.196	25.324	4	416	.000	
2	.527b	.277	.269	.7964206	.081	46.790	1	415	.000	
3	.539c	.290	.275	.7931441	.013	1.859	4	411	.117	.947

   a. Predictors: (Constant), Product differentiation, Market Concentration, Market share, Entry Barrier
   b. Predictors: (Constant), Product differentiation, Market Concentration, Market share, Entry Barrier, Market conduct
   c. Predictors: (Constant), Product differentiation, Market Concentration, Market share, Entry Barrier, Market conduct, MC_CN, EB_CN, PD_CN, MS_CN
   d. Dependent Variable: Profitability

ANOVA results presented in Table 3 show that all the three models are significant. Therefore, the models can still be used to explain the existing relationships despite the low coefficients of determination (Greene, 2002).

Table 3. ANOVA results for the three models

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.322	4	17.831	25.324	.000b
	Residual	292.907	416	.704		
	Total	364.229	420			
2	Regression	101.000	5	20.200	31.847	.000c
	Residual	263.229	415	.634		
	Total	364.229	420			
3	Regression	105.678	9	11.742	18.665	.000d
	Residual	258.551	411	.629		
	Total	364.229	420			

   a. Dependent Variable: Profitability
   b. Predictors: (Constant), Product differentiation, Market Concentration, Market share, Entry Barrier
   c. Predictors: (Constant), Product differentiation, Market Concentration, Market share, Entry Barrier, Market conduct
   d. Predictors: (Constant), Product differentiation, Market Concentration, Market share, Entry Barrier, Market conduct, MC_CN, EB_CN, PD_CN, MS_CN

Generally, moderation is a means through which researchers check whether or not a third variable influences the strength or direction of the relationship between an explanatory and explained variable (Rayees & Sandeep, 2017). In the case of mediation, an explanatory variable triggers a change in the mediator variable, which consequently changes the dependent variable. However, in practical sense, the nexus between the explanatory variable, mediator, and the explained variable are not tested for causality

but rather associationship. Therefore, the essence of mediation analysis is to asses if the influence of the mediator is stronger than the direct influence of the independent variable (Baron and Kenny, 1986). As generally expected in moderated multiple regression models, the problem of multicollinearity would be experienced in this study. However, this was avoided by using residual values of the interaction term. The variance of inflation factors (VIFs) associated with all the variables thus, fell within the recommended range of 10, suggesting absence of severe multicollinearity (Gujarati, 2004).

Model 1 in Table 4 shows that the four elements of sweet potato market characteristics have significant positive effects on sweet potato profitability. These significant positive results are in line with Odondo et al. (2014) profitability models that showed direct effects of sweet potato market structural characteristics on profitability at the farm, retail and wholesale levels in Rachuonyo South District. When market conduct is entered as a mediator, the direction of effects of all the dimensions of sweet potato market structural characteristics remained unchanged except the magnitude of effects that have slightly reduced in all cases. These findings suggest that sweet potato market structural characteristics can significantly influence sweet potato market performance through the market conduct, a finding that conforms to the structure, conduct performance paradigm (Tesfaye & Abdurezak, 2018). Model 3 shows the results when market conduct is entered as a moderator. It can be seen that out of the four dimensions of market structure (market share, market concentration, entry barrier and product differentiation), only entry barrier was significant at $p = 0.045 < 0.05$, suggesting that market conduct moderates the effect of entry barriers on the performance of sweet potato market. The finding is in tandem with the contestability theory, which argues against presumptive regulation of the monopolist. If a given market is contestable, the pricing behaviour of the existing firm would be disciplined by the threat of new entrants (Bratland, 2004). In fact, the behaviour of sweet potato market players e.g. on pricing of the commodity at different levels within the supply chain may either encourage or deter entry into the sweet potato business and eventually impact on the profits accruing to the sale of the commodity (Odondo, 2013). Similarly, Efficient Structure hypothesis posits that under the pressure of market competition (reduced or absence of entry barriers leading to more firms gaining entry into the industry), efficient firms win the competition and grow and eventually obtain greater market share leading to higher profits (Sathye, 2005).

Heger and Craft (2008) aver those conditions of entry and exit are imperative in determining the incumbent firms' possibilities to exert market power. Snider and Williams (2011), using regression discontinuity approach to analyse barriers to entry into the US airline industry revealed that nearly half of the reduction in fares was compelled by the entry of low-cost carriers into the markets. Kiandiko (2007), who investigated the extent to which barriers to entry impacted on profitability in the air compressor industry in Kenya, agrees with this observation. Although, these studies were in other sectors, their findings corroborate those in the current study. From the results, it can be argued that removal or reduction of entry barriers identified by Odondo (2023) such as uncertainties in market demand for sweet potatoes coupled with inadequate storage facilities and pecuniary requirements particularly for transportation of the commodity can enhance competitiveness of the industry especially at the wholesale level which is less contestable. Value addition may widen the customer base hence increased demand and profits ceterisparibus.

Table 4. Estimated coefficients associated with the three models

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	9.794	.041		239.492	.000		
	Market share	.218	.061	.166	3.565	.000	.892	1.121
	Market Concentration	.249	.049	.232	5.071	.000	.921	1.086
	Entry Barrier	.114	.050	.107	2.287	.023	.889	1.124
	Product differentiation	.227	.050	.205	4.588	.000	.966	1.035
2	(Constant)	9.794	.039		252.328	.000		
	Market share	.161	.059	.122	2.743	.006	.874	1.144
	Market Concentration	.127	.050	.119	2.547	.011	.803	1.245
	Entry Barrier	.093	.048	.087	1.962	.050	.886	1.129
	Product differentiation	.132	.049	.119	2.691	.007	.888	1.126
	Market conduct	.387	.057	.333	6.840	.000	.735	1.361
3	(Constant)	9.786	.043		229.040	.000		
	Market share	.176	.061	.134	2.898	.004	.805	1.242
	Market Concentration	.123	.052	.114	2.355	.019	.733	1.364
	Entry Barrier	.077	.049	.072	1.583	.114	.839	1.192
	Product differentiation	.134	.051	.121	2.660	.008	.831	1.204
	Market conduct	.370	.058	.318	6.383	.000	.695	1.439
	MS_CN	-.051	.040	-.059	-1.271	.204	.800	1.250
	MC_CN	.051	.041	.055	1.249	.212	.876	1.142
	EB_CN	.079	.039	.091	2.013	.045	.837	1.195
	PD_CN	-.042	.036	-.053	-1.168	.244	.847	1.181

a. Dependent Variable: Profitability

4. Conclusion and Recommendations

The study sought to determine effect of sweet potato market conduct on the nexus between sweet potato market structure and performance in Kenya. From the findings, sweet potato market concentration, market share, product differentiation and entry barriers all had direct significant positive effects on sweet potato profitability. It was also established that the four dimensions of sweet potato market structure could influence profitability through behaviour change among the market participants. Additionally, the relationship between entry barriers and sweet potato profitability is moderated by the behaviour of sellers in the market. Therefore, the study concludes that sweet potato market conduct significantly

moderates the link between entry barriers and performance as opposed to the other three (i.e. market concentration, market share, and product differentiation) measures of market characteristics. Secondly, the market is imperfectly competitive due to the existence of oligopoly market tendencies. These market tendencies can be reduced through market interventions such as provision of market demand through value addition within the supply chain and enhancing market participation through reduction or elimination of perceptible barriers to entry into the sweet potato industry. Such interventions together with monitoring of the conduct of sweet potato sellers may strengthen market efficiency and increase social welfare among the market players.

Acknowledgement

References

Andea, G. (2012). *Sweet potato production up in Kenya*. Kenya Agricultural Commodity Exchange LTD. http://www.kacekenya.co.ke/news.asp?ID=275.

APEC Agricultural Technical Cooperation Working Group. (2008). *Market liberalization and its relationship with market structure, conduct and performance of the food processing industry in ASEAN Economies*. http://www10.iadb.org/intal/intalcdi/ PE/2009/03350.pdf.

Babbie, E. (1989). *The practice of social science* (3rd ed.). Belmont, C.A.: Wadsworth Cengage.

Babbie, E. R. (2010). *The Practice of Social Research* (12th ed.). Belmont, CA: Wadsworth Cengage.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology,* 51, 1173–1182.

Bratland, J. (2004). Contestable Market Theory as a Regulatory Framework: An Austrian Post-mortem. *Quarterly Journal of Austrian Economics, 7*(3), 3-28.

Byaruhanga, J. K. (2002). *Structure and performance of fish Market in Lake Victoria region, Kenya*. Unpublished PhD thesis, Maseno University, Kenya.

Carey, E. E., Gichuki. S. T., Ndolo, P. J., Turyamureeba, G., Kapinga, R., & Lutaladio, N.B. (1997). Sweet potato breeding for Eastern Central and Southern Africa: An Overview. In *Proceedings of the 4th Triennial Congress of the African Potato Association*. Pretoria, South Africa, 23-28 Feb. 1997, 89-93.

Cassey, L. (2007). *SCP, NEIO and Beyond*. Working Paper Series Vol. 2007-05.

Church, J., & Ware, R. (2000). *Industrial organization: a strategic approach*. McGraw-Hill.

CIP. (2009). *Unleashing the potential of sweet potato in Sub- Saharan Africa: Current challenges and way forward*. Social Sciences. Working paper no. 2009-1.

FAO. (2002). *The state of food insecurity in the world*.

FAO. (2003). *The state of food insecurity in the world*.

Geroski, P. (1981). Specification and testing the profit-concentration relationship, some experiments for the U.K. *Economica*, *48*(1981), 279-288.

Goldschmidt, H. J., Mann, M., & Weston, J. F. (1974). *Industrial concentration: The new learning* (4th ed.). Little Brown & Company.

Greene, W. H. (2002). *Econometric Analysis* (5th Ed.). Upper Saddle River: Prentice Hall.

Gujarati, D. N. (2004). *Basic Econometrics* (4th Ed.). McGraw-Hill Companies.

Harris, B. (1993). *There is method in my madness: Or is it. Vice versa? Measuring agricultural market. Performance*.

Heger, D., & Craft, K. (2008). *Barriers to entry and profitability*. Discussion Paper no. 08-071. http://ftp.zew.de/pub/zew-docs/dp/dp08071.pdf.

International Potato Centre (CIP). (1998). *Annual Report*, pp 8-9.

Kai-Yu, H., & Freek, V. (2003). The Structure of Competition: How Competition Between One's Rivals Influences Imitative Market Entry. *Organization Science*. Articles in Advance, pp. 1–2.

Kapinga, R. E., Ewell, P.T., Jeremiah, S. C., & Kileo, R. (1995). *Sweet potato in Tanzanian farming and food systems: Implications for research. CIP, Sub-Saharan Africa region, Nairobi, Kenya*. Ministry of Agriculture, Dar-Es-salaam, Tanzania.

Kiandiko, K. R. (2007). *Analysis of the extent to which barriers to entry have contributed to profitability in the air compressor industry in Kenya*. Published MBA thesis, University of Nairobi, Kenya.

Kibwage, J. K., Odondo, A. J., & Momanyi, G. M. (2009). Assessment of Livelihood Assets and Strategies among Tobacco and Non-tobacco Farmers in South Nyanza region, Kenya. *African journal of Agricultural Research*, *4*(4), 294-304.

Kothari, C. R. (2010). *Research Methodology: Methods and Techniques* (2nd ed.). New Delhi.

Lipczynski, J., Wilson, J. J., & Goddard, J. (2005). *Industrial Organization: Competition, strategy, policy* (2nd ed.). Prentice Hall.

Lyons, B. R. (1981). Price cost Margins, Market Structure and International Trade. In D. Currie, D. Peel and W. Peters (Eds.), *Micro economic Analysis*. London: Croom Helm.

Maman, S., Grigorios, E., & Alfons, O. L. (2012). Industrial Concentration and price-cost margin in the Indonesian food and beverage sector, *Applied Economics*, *1*(27).

Mugenda, O. M., & Mugenda, A. G. (2003). *Research Methods, Quantitative and Qualitative Approaches*. ACT, Nairobi.

Mukras M. S., Odondo J. A., & Momanyi G. (2013). Determinants of Demand for Sweet Potatoes at the Farm, Retail and Wholesale Markets in Kenya. *British Journal of Advances in Economics and Business, 1*(2), 150-158.

Nambiro, E., Hugo, D. G., & Willis, O. K. (2001). Market structure and conduct of the hybrid maize seed industry; A case study of the Tranzoia district in western Kenya. A paper Presented in *the Seventh Eastern and Southern Africa Regional Maize conference* 11th-15th February, 2001, pp. 474–479. http://www.cimmyt.org/english/docs/proceedings/africa/pdf/98Nambiro.pdf.

Ngigi, J. (2008). *Structure, Conduct and Performance of Commodity markets in South Sudan: Linkages Food Security*. http://www.fao.org/fileadmin/user upload/sifsia/docs/SouthSudan_ SCP_study%20 report_1.pdf.

Nungo, R. A., Ndolo, P. J., Kapinga, R., & Agili, S. (2007). Development and promotion of sweet potato products in Western Kenya. *Proceedings of the 13th ISTRC Symposium*, Arusha, Tanzania, pp. 790-794.

Odondo J. A., Mukras M. S., & Momanyi G. (2013): An analysis of Market power of sweet potato traders in Kenya: A Case of Rachuonyo South District and its Key Market outlets. *British Journal of Advance Academic Research*, *2*(1), 54-61.

Odondo J. A., Mukras M. S., Momanyi, G., & Bosire, E. K. (2014). Determinants of Sweet Potatoes (Ipomoea Batatas L) Profitability In Rachuonyo South District, Kenya, *International Journal of Managerial Studies and Research (IJMSR), 2*(4),48-60.

Odondo, A. (2023). Structural Characteristics and Conduct of Sweet Potato Market in Rachuonyo Region, Kenya: Perception of Sweet Potato Farmers and Traders. *East African Journal of Business and Economics*, *6*(1), 242-254.

Pindyck, R. S., & Rubinfeld, D. L. (1998). *Econometric models and economic forecasts* (4th ed.). Boston: Irwin/ McGraw-Hill.

Rayees, F., & Sandeep, V. I. (2017). Moderating Variables in Business Research, *The IUP Journal of Business Strategy*, *14*(4), 35-46.

Ritz, R. A. (2008). Strategic incentive for market share. *International Journal of Organization*, *26*(2008), 586–597.

Rossman, G. B., & Rollis, S. F. (2003). *Learning in the Field: An introduction to Qualitative Research* (2nd ed.). Thousand Oaks, CA: Sage.

Sathye, M. (2005). Market Structure and Performance in Australian Banking, *Review of Accounting and Finance*, *4*(2), 107-122.

Seanicaa, E., Albert, J. A., & Saleem, S. (2006). *Market structure Conduct Performance(SCP) hypothesis revisited using stochastic frontier efficiency analysis*. http://ageconsearch.umn.edu/ bitstream /21350/1/sp06ed01.pdf.

Shafer, S. (2004). Patterns of competition in banking. *Journal of Economics and Business, 56*, 287- 213.

Snider, C., & Williams, W. (2011). *Barriers to entry in the airline industry: A regression Discontinuity Approach*. University of Georgia. http://www. econ. ucla.edu/people/papers/Snider/Snider507.pdf.

Tesfaye, B. L., & Abdurezak, M. K (2018): The Structure Conduct Performance Model and Competing Hypothesis- A Review of Literature. *Research Journal of Finance and Accounting, 9*(1), 76-89.

Thomas, H. C. (2006). *Trade reforms and food security: country case studies and syntheses*. ftp://ftp.fao.org/docrep/fao/009/a0581e/a0581e00.pdf.

VanHoose, D. (2009). *The Industrial Organization of Banking, Bank Behaviour, Market Structure, and regulation*. Springer - Verlag, Berlin Heidelberg.

Woolfe, A. J. (1992). *Sweet potato: An untapped food resource*. Cambridge University Press, Cambridge. http://pdf.usaid.gov/pdf_docs/pnabn334.pdf.