

Full Length Research Paper

An analysis of the efficiency of indigenous chicken marketing channels in Makueni County, Kenya

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The indigenous chicken (IC) (*Gallus domesticus*) production is an important agricultural activity in many households in Kenya. Despite its importance, little research has been carried to enhance its productivity. Focus now is on IC because it presents an ideal poverty-food insecurity exit strategy especially for smallholders. It has been recently noted that market linkages is key in enhancing agricultural productivity and sustainability. However, there is little information on the marketing efficiency of IC in Makueni. Therefore the objective of this study was to analyse the marketing efficiency of the IC market and make policy recommendations to support IC value chain. A total of 66 IC traders and 130 producers were selected using purposive random sampling in Makueni and Nairobi counties. A pretested questionnaire was administered and data analysed using the shepherd index and multiple regression. A total of 8 marketing channels were identified, with a marketing efficiency index of between 5.29 and 1.81. Marketing cost, number of intermediaries, marketing margin, profit and price of IC had a significant effect on the marketing efficiency. Therefore it was recommended that contract models should be adopted for collective marketing and an improved marketing efficiency.

Key words: Indigenous chicken, productivity, efficiency, value chain, shepherd index.

INTRODUCTION

Agriculture contributes 25% of the Kenyan GDP, 65% of the export earnings and employs 70% of the population in the rural areas (RoK, 2010a, b). In addition, it plays a central role under the economic pillar of the Vision 2030 and is therefore closely linked to the Economy of Kenya (Gitau, 2009). The livestock sub sector contributes 7% to the GDP and provides raw material to other agro processing industries (RoK, 2010b). The livestock sub sector has poultry as one of its main components, of which 76% are indigenous chicken (IC), with a population of 31 million birds (Nyaga, 2007). These IC in Kenya contributes to the economic, social and cultural welfare (Kimani, 2006; Kitalyi, 1998).

A majority of the households in Kenya keep IC under various production systems (Nyaga, 2007; Okello et al., 2010; Okitoi et al., 2006). These production systems have different marketing systems, with large scale production being more formalized (Okello et al., 2010). However, most small holder farmers keep IC under free

range system, which requires low input levels (Okitoi et al., 2006; Menge et al., 2005).

The IC markets in Kenya have segments based on the consumer preferences and incomes (Upton, 2000; Ndegwa et al., 2000; Gamba et al., 2005). These IC markets have been expanding due to the increase in meat consumption (Delgado et al., 1999; Delgado, 2005). This increased consumption has been linked to the rise in income, urbanization and consumer tastes (Delgado, 2005; Upton, 2000). In addition, consumers are ready to pay higher prices for safe and quality products in the high income market segments (Gamba et al., 2005). Furthermore, demand for white meat is on the increase due to a rising health conscious consumer.

Makueni is one of the leading areas in Eastern Kenya

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in the production of IC despite the erratic rainfall and cases of crop failures (Omiti and Okuthe, 2007). Livestock production contributes to 50% of household incomes, while crops contribute to 30% (ACF-USA, 2012). However, despite the presence of high income market segments for IC, 60% of the population continues to live under the poverty line.

The marketing efficiency is related to the prices of products, the costs incurred, profits/incomes obtained by the participants (Lutz, 1994; Ferguson and Ferguson, 1994). However, there has been little research to establish the marketing efficiency of IC markets in Makueni. In Kenya, most of the studies on IC have focused on aspects of production of IC (Nyaga, 2007; Okello et al., 2010, Okitoi et al., 2006). In addition, some studies have described consumption patterns and consumer preferences (Delgado et al., 1999; Hazell, 2007; FAO, 2009). There are studies (Menge et al., 2005; Bett et al., 2012) that focused on the profitability and marketing of IC in Kenya, but none of these studies specifically calculated the marketing efficiency or determined the effects of various socioeconomic factors on it.

The aim of this study was to analyse the marketing efficiency of the IC market channels between Makueni and Nairobi. This was achieved by describing the marketing channels of indigenous chicken, calculation of the marketing efficiency and determining the effects of socioeconomic factors based on the marketing efficiency.

RESEARCH METHODOLOGY

Study site

Makueni District, found within Makueni County, lies between Latitude 1°35' South and Longitude 37°10' East and 38°30' East. The district covers 8,009 km² with an altitude of 600 - 1,900 m above sea level. It has rainfall variability with an annual range of 800 - 1,200 mm per year in the hilly areas and less than 500 mm per year in the other regions. The temperature range in the district is 20.2 - 24.6°C (RoK, 2005). Makueni is found in an area that is classified as arid and semi arid land (ASALs) (RoK, 2005). The variability of rainfall results into draught, scarcity of water and food shortage (FAO, 2013). According to ACF-USA (2012), there are two livelihood zones in Makueni County, which include marginal mixed farming zone and mixed farming zone. These zones are further divided into 3 agro pastoral zones. The main agricultural products from these zones are coffee, dairy, poultry including IC and food crops.

Data sampling and design

The sampling design that was used was a survey design. This comprised three stages. First, a purposive random

sampling was used to select Makueni District from among IC producing areas in Kenya. Secondly, random sampling was used to select three regions (divisions) from other divisions in Makueni District. These divisions were Kalawa, Kaiti, and Wote in Makueni from where traders were selected using random sampling technique. The traders were selected based on the availability of markets, since there is no agreed method of finding the sample size at the different levels of a value chain (Mendoza, 1995). A total of 130 households were selected from the three regions (divisions) and 66 traders were sampled from Makueni and Nairobi markets. Data were collected between 5th March and 27th April 2013 using a structured questionnaire.

Theoretical framework

Ajala and Adesehinwa (2007) noted a change in theoretical and applied models used in market analysis. These models included: Structure, conduct and performance (SCP), Commodity approach and Transaction Cost Economics (TCE). They attributed the wide array of models to inadequacy of any single model to study markets in the developing countries. Therefore they recommended a blend of the models for complementary purposes and depending on the nature of the problem under study.

Seanicaa et al. (2006) showed that there has been an evolution in the theory of marketing efficiency, which has led to emergence of at least two hypotheses. These two hypotheses include the "structure performance hypothesis" (SPH) and "efficient structure hypothesis" (ESH). The SPH proposes that markets with high concentration have a poor performance. On the other hand, the ESH proposes that performance is related to the market shares, which raises the profits. Examples of studies that confirmed the SPH are Bett et al. (2012), Afolabi (2007) and Olufemi (2010), while those that confirmed the ESH included Emam (2011), Massoud and Srinivasa (2012), Farayola et al. (2013) and Dastagiri et al. (2013).

As shown in Figure 1, the elements of Market Structure include: the barriers to entry and exit and marketing channels; Conduct include: pricing strategies and promotion strategies; and Performance include: marketing costs, marketing margins and profits (Greer, 1992). These elements of the markets were assumed to have a sequential relationship (Ferguson and Ferguson, 1994). On the other hand, the socioeconomic characteristics of the traders were conceptualized to have an effect on the marketing efficiency (Dastagiri et al., 2013; Farayola et al., 2013).

Model specification

To estimate the effect of variables on the marketing

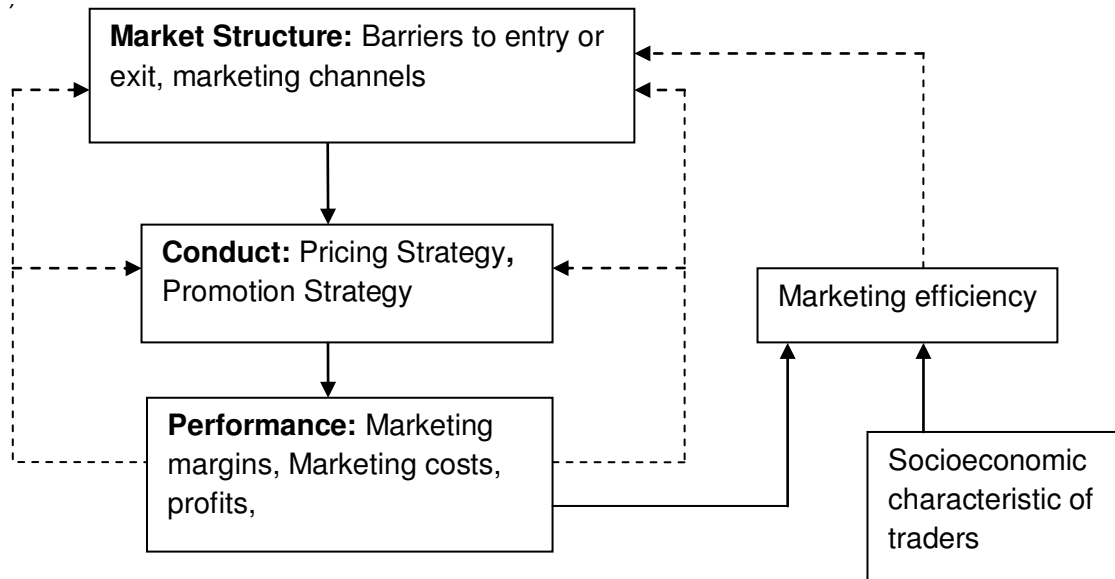


Figure 1. The conceptual framework. Modified from Lutz (1994).

Table 1. The independent variables used in multiple regression.

Variable	Explanation	Units	Expected sign
X ₁	Age of trader	Years	+
X ₂	Family size	Number	+
X ₃	Group member	1=Yes, 0=No	+
X ₄	Marketing cost	Kenya shillings	-
X ₅	Marketing margin	Kenya shillings	-
X ₆	Consumer price	Kenya shillings	+
X ₇	Profit	Kenya shillings	+
X ₈	Number of intermediaries	Number	-

efficiency, a multiple linear regression model was used. This was because the dependent variable was a continuous variable and therefore a multiple linear regression was suitable as shown in other studies by Farayola et al. (2013) and Dastagiri et al. (2013). The econometric model was specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + e$$

where Y = marketing efficiency, β parameter to be estimated and e is the error term and the other variables are specified in Table 1.

Data analysis

Marketing performance and efficiency

After marketing channels for the IC between Makueni and

Nairobi were described, the performance of the IC market was assessed by calculating marketing margins along these channels. In addition, the marketing costs along each channel were determined and subsequently used in calculation of the marketing efficiency of the IC market (Table 5). The marketing margins that were calculated included:

i) $\frac{EBP - FSP}{EBP} \times 100 = TGMM$ (Hays, 1975) where

TGMM is the total Gross Margin, EBP is the end buyer price and FSP is first seller price.

ii) $\frac{EBP - MGM}{EBP} \times 100 = GMMp$ (Hays, 1975) where

GMMp is the gross marketing margin of producers and

Table 2. Socioeconomic characteristic of traders.

Characteristic	Mean	Max	Min
Age of trader (Years)	36	22	60
Family size (Number)	4	1	8
Experience (Years)	8.1	0.5	23
Capital (Kenya shillings)	49,091	2,000	200,000

Table 3. The education levels and group membership of traders.

Variable	Percentage
Education	
Primary	32
Secondary	56
Tertiary	12
Group member	
Yes	21
No	79

MGM is marketing gross margin.

The marketing efficiency was calculated using the Shepherd index for each of the marketing channels that were identified:

$$\text{iii) ME} = \frac{V}{I} - 1 \quad (\text{Shepherd, 1965})$$

where ME= Marketing Efficiency Index;

V= Value of IC sold in Kenya Shillings per Kilogram (Ksh/Kg);

I = Total marketing cost in Kenya Shillings per Kilogram (Ksh/Kg).

Determinants of marketing efficiency

A multiple linear regression was done to determine the factors that have a significant effect on the marketing efficiency. The dependant variable was the marketing efficiency, while the independent variables are indicated in Table 1.

EMPIRICAL RESULTS AND DISCUSSION

The results of the socioeconomic characteristics of traders are shown in Tables 2 and 3. These results show that the average age of traders was 36 years, with a minimum of 20 years and a maximum of 60 years respectively. The average family size was 4, with a minimum of 1 (single) member and a maximum of 8

members. The average experience was 8 years, with a minimum of 0.5 years (6 months) and a maximum of 23 years. The traders started their business with an average of Ksh.49, 091, with a minimum of Ksh, 2000 and a maximum of Ksh, 200,000 (1 US \$=86.80 Kenya shillings).

The traders had some education level and group membership status was summarized in Table 3. There were 56% of the traders with a secondary level of education, while 32% had a primary level of education and 12% had a post secondary level of education. There were only 21% of the traders that belonged to trader groups, while 79% did not belong to any groups and operated alone.

The summary of the marketing characteristics of the traders is shown in Table 4. These characteristics include means of payments, when pricing is done, promotion strategies, how prices are arrived at, and value addition activities; the main sources of capital, storage of unsold stock and main sources of input.

Market channels

The marketing channels are components of the market structure (Lutz, 1994). There are eight main marketing channels that were identified, as shown in Figure 2, between the producers and consumers, in Makueni and Nairobi respectively.

The marketing channels for IC were of different length as shown in Figure 2. Channel 1 was a short and direct marketing channel, which had producers and consumers, who purchased IC at the farm gate in Makueni. The IC that did not satisfy the requirements for the distant markets in Nairobi was sold through this channel. The prices varied depending on urgency of raising money and negotiating skills of the buyers, which confirms with the findings of the study by Okitoi et al. (2006).

As indicated in Figure 2, channel 2 was made of producer, retailer 1 and consumers. This channel was used at the local markets at Makueni. The activities in this channel represented some form of vertical integration, which is similar to the activities that were reported in a study by Olufemi and Adeolu (2010) in poultry processing in Nigeria. However, in the current study, the retailers found at Makueni that information are provided to distant traders in Nairobi at this level.

Channel 3 had the producer, retailer 1, retailer 2 and the consumer. This channel was common in Nairobi and Makueni and included the local market, butcheries, supermarkets, hotels and guest houses. This channel therefore distinguished the two types of retailers (retailer 1 and retailer 2) in the IC market, based on value addition or processing. These markets have specific requirements and consumer preferences as shown by Gamba et al. (2005).

The fourth channel as shown in Figure 2 consisted of producers, assemblers, retailer 1 and the consumers.

Table 4. Summary of marketing characteristics.

Means of payment for IC	Response (%)	Pricing period	Response (%)
Cash	57	At delivery	32
Credit	30	Before delivery	50
Cash and credit	13	After delivery	18
Promotion strategies	Response (%)	Determinant of price	Response (%)
Good prices	45	Negotiation	50
Fair treatment	34	Availability	32
Advertising	20	Seasons	16
Others	1	Others	2
Value addition activities	Response (%)	Source of capital	Response (%)
Yes	45	Loans	16
No	55	Friends	5
		Own	80
Handling of unsold stock	Response (%)	Source of input	Response (%)
Kept for next day	38	Agro vet	33
Sold at lower price	48	Local market	60
Sold at another market	14	Others	6

Table 5. The marketing performance and efficiency of channels in Kenya currency (Ksh)*.

Variable	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
Producers' price	256.00	328.00	366.00	386.00	370.00	386.00	366.00	434.00
GMMp	69.00	57.44	55.20	55.60	48.43	45.84	38.65	38.78
Consumers' price	371.00	571.00	663.00	707.00	764.00	842.00	947.00	1119.00
Total marketing cost	59	211	267	252	255	283	303	381
Profit	56	32	30	69	139	173	278	304
Marketing margin	115	243	297	321	394	456	581	685
TGGM	31	42.56	44.80	45.40	51.57	54.16	61.35	61.22
Marketing efficiency	5.29	1.71	1.48	1.81	2.00	1.98	2.12	1.94

* Field Survey Data in 2013.

The supply of IC along this channel changed depending on demand, seasons and prices offered by other traders. These are common occurrence in livestock markets as reported by Barrett (2007). Consequently these results revealed retailers and assemblers as performing an additional role of linking producers to consumers and providing market information.

The producers, assemblers and consumers constituted the fifth channel as shown in Figure 2. This channel was used in cases where the assemblers at Makeni found better prices from traders at Nairobi, based on

negotiation, demand for IC and season (Table 4). However, the other factors that determine the choice of channel included availability of storage space and attraction of customers (Table 4). These results contradict those of a study by Ngigi (2002) that showed that producer may select channels on the basis of reducing costs, price and transactional risks that were associated with a market channel. Another factor that influenced the choice of a channel was the trust, which was based on the number of years that the traders had transacted with each other (Table 2). This reason gave

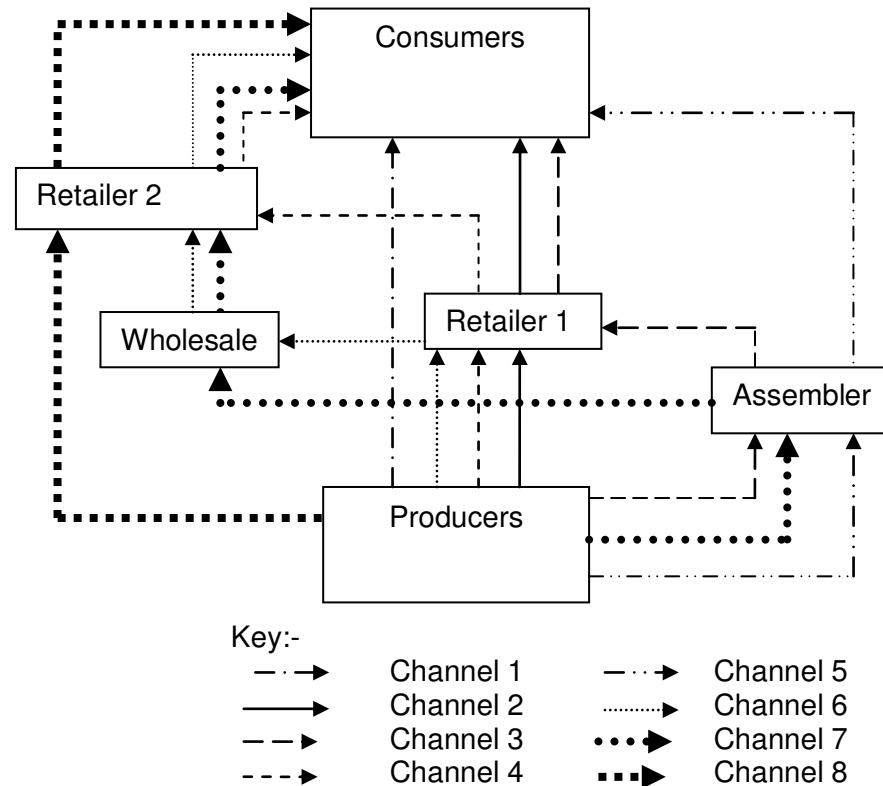


Figure 2. Marketing channels for IC between Makeni and Nairobi.

emergence to the sixth, seventh and eight channels respectively, which showed the different shopping options that the consumers in the high value markets used when obtaining IC from retailer 2.

Market performance and marketing efficiency

The results in Table 5 show that the 8 marketing channels had an average GMMp of 51%, which included channel 1 that had a GMMp of 69%, while channel 8 had a GMMp of 39%. This indicated that the producers had a good share in the final consumer prices in channel 1 compared to channel 8. This was due to the absence of intermediaries in channel 1 and the low marketing costs as presented in Figure 2 and Table 5 respectively.

On the other hand, the average TGGM of the 8 channels was 49%, with channel 7 and 8 having TGMM of 61% and channel 1 with a TGMM of 31%. The marketing margin was a total of the total marketing costs and profits (Table 5). Channel 1 had a marketing cost of Ksh 59/kg and a profit of Ksh 56/kg compared to channel 8 that had a marketing margin of Ksh 685/kg and a profit of Ksh 304/kg (Table 5). This situation was due to a consumer price of Ksh 1119/Kg along channel 8, which led to a marketing margin of Ksh 685/kg and a profit of Ksh 304/kg. These results therefore are consistent with those of Harigan et al. (1992) that showed there were

higher marketing margins when the transport costs were high and there was poor storage infrastructure.

The results in Table 5 show that the IC markets were efficient with an overall marketing efficiency of 2.29. There was a marketing efficiency of 1.94 in channel 8, channel 1 had a marketing efficiency of 5.29 while channel 3 had a marketing efficiency of 1.48 (Table 5). As shown by the results in Table 2, the related marketing costs for channel 8, channel 1 and channel 7 were: Ksh 207, Ksh 115 and Ksh 581 respectively. The large marketing costs in channel 7 were due to the large number of intermediaries in the channel (Figure 2). The results are consistent with those of Massoud and Srinivasa (2012) who reported lower marketing efficiency in marketing channels with higher marketing costs, and thus recommended the use of cooperatives to reduce the costs and increase the marketing efficiency. However, Emam (2011) established an inverse relationship between large marketing margins and marketing efficiency of retailers and wholesalers in tomato markets in Khartoum. Therefore this was an indication that despite some channels having large profits, they were not very efficient (Table 5).

The determinants of marketing efficiency

The age of the traders significantly influenced the

Table 6. The results of multiple regression of marketing efficiency.

Variable	Coefficient	Std. Err.	T	P>t
Age	0.0079	0.0034	2.32	0.022**
Marketing cost	-0.0158	0.0015	-10.53	0.000***
Profit	0.0028	0.0012	2.33	0.030**
Consumer price	0.0041	0.0001	41.00	0.000***
Marketing margin	0.0029	0.0013	2.23	0.023**
Number of intermediary	-0.0772	0.0390	-1.98	0.053*
Family size	-0.0183	0.0190	-0.96	0.340
Group membership	0.1578	0.0905	1.74	0.087*
Constant	2.1721	0.1955	11.11	0.000***

marketing efficiency at 5% level of significance (Table 6). The coefficient showed that an increase in the age of the trader by one year led to an increase in market efficiency by 0.8% holding all other variables constant. This increase was due to experience of the older traders in the identification of markets and performing marketing activities. The results agree with those of Farayola et al. (2013) that showed that age positively affected the marketing efficiency of small holder marketers in Oyo, Nigeria.

The marketing costs had a negative and significant effect on the marketing efficiency at 1% (Table 6). The coefficient showed that an increase in the marketing cost led to a reduction in the marketing efficiency by 16% holding all other factors constant. This was due to the transaction costs incurred by traders in sourcing, transporting and processing the IC. This result agrees with those of Dastagiri et al. (2013) who showed that marketing costs had a negative effect on the marketing efficiency of vegetables in India.

The price that was paid by the consumer had a positive effect on the marketing efficiency and was significant at 1% (Table 6). The coefficient indicated that an increase in the consumer price by Ksh 1 led to an increase in the marketing efficiency by 4% holding all variables constant. This was because good consumer prices motivated the traders and resulted in increased marketing efficiency. The results concur with those of Evan (2004) which showed that an increase in product prices leads to increased production and marketing efficiency due to motivation of producers.

The marketing margins had a negative and significant effect on the marketing efficiency at 5% level (Table 6). The coefficient showed that an increase in the marketing margin led to a reduction in marketing efficiency by 3%. The larger the marketing margins lead to a wide difference between the successive stages in the market, the more it discouraged marketers and reduced marketing efficiency. These results agree with those of Emam (2011) which found that marketing margins had a negative effect on the marketing efficiency of tomato in

Sudan.

The number of intermediaries between the producer and consumers had a significant and negative effect on the marketing efficiency at 10% (Table 6). The coefficient indicated that an increase in the number of intermediaries by one led to a reduction in the marketing efficiency by 8%, holding all other variables constant. The increase in number of intermediaries led to an increase in marketing costs, which resulted in reduced marketing efficiency. These results agree with those of Massoud and Srinivasa (2012) which showed that direct Saffron marketing channels had higher efficiency as compared to those that had many intermediaries.

There was a positive and significant relationship between being a member of a trader group and the marketing efficiency (Table 6). The coefficient indicates that being a member of traders' group leads to an increase in marketing efficiency. This increase is due to the access to marketing information, easy market access and benefits associated with being a member of these groups. The results agreed with those of Farayola et al. (2013) that showed that being a member of a cooperative increased the marketing efficiency of cocoa marketers in Oyo State in Nigeria.

There was a positive and significant relationship between the profit and marketing efficiency (Table 6) at 5% level of significance ($P < 0.05$). The increase in profits led to an increase in the marketing efficiency. This was because profits were an inducement to the traders and consequently an increase in the marketing efficiency. These results agree with those of Craig et al. (2006) which showed that better returns were an inducement for increased production and efficiency.

CONCLUSION AND RECOMMENDATION

The study concluded that these IC markets were not concentrated and therefore allowed for competition. The IC markets were found to have high marketing efficiency in the channels that had direct marketing. Therefore it is recommended to use centralized contract models for

direct marketing of IC, the reduction of the current marketing costs and to increase producers share in the final consumer price. The adoption of this strategy will make the IC products more competitive as a result of vertical integration with IC traders in the high value markets. The traders should also adopt product differentiation and diversify on their products as an upgrading strategy.

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