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Market Concentration in the Dairy Processing Industry in Kenya and Producer Milk Prices

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SUMMARY

The dairy processing industry in Kenya has been quite dynamic characterized by acquisitions, change in market leaders and new entrants. In addition, a few major players control a large market share likely making the industry concentrated. Mergers and acquisition are likely to increase market concentration. Theoretically, a highly concentrated market is less efficient in distributing industry gains. Recent analysis on changes in market structure and how this has affected market concentration and welfare is not available. In this study, we calculate market concentration in the dairy processing industry and relate it to changes in producer milk prices. The analysis relies on milk intake data and producer milk prices. We use the Herfindahl–Hirschman Index (HHI) to measure the degree of market concentration. Results shows that at any one time from 2005-2015, the market leader controls more than a third of market share. Calculations show that the dairy processing industry in Kenya is moderately concentrated on average. Additional, we observe that though nominal milk prices have increased overtime, real prices have actually fallen. HHI has also fallen overtime, but prices have fallen more sharply. Correlation analysis yields a negative but insignificant coefficient, meaning that we can't conclude   a relationship between HHI and prices. We recommend exploring ways of ensuring increasing real producer milk prices; regularly monitoring changes in market structure and concentration; encouraging more players in the industry hence addressing entry challenges; and more rigorous analysis on the effect of market concentration on milk prices.

BACKGROUND

The dairy processing industry in Kenya, which commands about 15% of marketed milk, has been quite dynamic. After the liberalization of the subsector, the industry witnessed a surge in the number of processors, mini-dairies and cooperatives involved in milk processing. Karanja et al. (2003) notes that 42 milk processors had been licenced by the Kenya Dairy Board (KDB) since 1992 although only 34 of these were operational in 1999. In December 2007, the four largest processors and their market shares were: New KCC (39%), Brookside (31%), SpinKnit (13%) and Githunguri Dairy (9%) (Technoserve, 2008). Thus the three largest processors controlled about 73% of the market. In the year 2009, Brookside acquired Spin Knit, the fourth largest player at the time, and this had an effect on the market structure (Muriuki, 2011). The three largest processors, now New KCC, Brookside and Githunguri dairy, controlled about 85% of the market (SNV, 2013), possibly indicating high concentration. In addition, Brookside dislodged new KCC as the market leader, contolling 36% as opposed to New KCC's 34%. This is likely to have increased market concentration within the subsector as a result of the reduction in the number of players, and a large market share being controlled by fewer processors.

Since then, there have been several other changes in the market structure. Several other processors such Buzeki Dairy and Delamere were acquired by the market leaders. At the same time, there have been new entrants into the market including Kinagop Dairy, Aspendos Dairy, Upland premium Dairy, Wakulima and Sameer Agriculture and Livestock Limited (SALL). Meru Central FC also saw a resurgence in 2015

with increased processing capacity. There has also been cases of other processors closing down.

Theoretically, the more concentrated a market is, the more inefficient it is in translating the gains of the industry to other players in the chain. This is because of the likely movement towards oligopolistic/oligopsonistic tendencies by players with huge market shares. According to economists, perfect competition, which represents a market dominated by many small players, is the model that translates most welfare to society (Stavins et al., 1996).

Rationale

Updated information on how the structure of the dairy processing industry in Kenya has changed in the recent past is not available. Concerns about the market being even more concentrated arise because of the main industry player acquiring small processors. But a good understanding of the market concentration will only be clear with an analysis based on market shares.

Additionally, concerns about increased market concentration in the Kenyan dairy processing industry come at a time when farmers have been complaining about low producer prices. This leads to the question whether there may be any correlation between the degree of market concentration and the trend in producer prices, and if so, if market concentration has an impact on the prices. Indeed, the ability to influence prices (hence margins) is considered one incentive in pursuing mergers and acquisitions.

Objectives

In this study, we map the trend in the structure of the dairy processing industry, calculate the level of market concentration and relate it to changes in milk producer prices.

Data and Methods

This study uses quantitative data on milk intakes by various processors obtained from the Kenya Dairy Board for the years 2005-2015. Milk producer prices are obtained from the KNBS statistical abstracts. Data on market share (based on milk intakes by various processors) is used to calculate concentrations ratios and market concentration index. We use the Herfindahl–Hirschman Index (HHI) to measure the degree of market concentration (Perekhozhuk et al., 2014; Bikker and Haaf, 2002). Degree of concentration refers to the extent to which a relatively large percentage of the market is controlled by a relatively small number of firms. We use graphic and correlation analysis to relate concentration measures with producer milk prices.

Findings

a) Trends in milk intake market share by processors

As earlier indicated, New KCC was the market leader controlling the largest market share of milk intake by processors until 2009 when Brookside took the market lead (Fig 1). Since then, brookside has been controlling atleast 35% of the market whith a high of 41% in 2014 though this dropped again in 2015.

New KCC, though being in the second position dropped its market share to below 30% since 2012 and this has remained in the range of 20%. Indeed, the gap between the two in terms of market share has widened overtime.

Spin Knit had been in the third position until 2007 when it was overtaken by Githunguri dairy, and it was later acquired by Brookside in 2009. Githunguri dairy has maintained the third position with a market share ranging from 14-17% since year 2009. In 2015, Sammer A & L was number four with a share of 10% followed by Meru Central FC at 7%.

Fig 1. Processor milk intake market share from 2005-2015 (%)
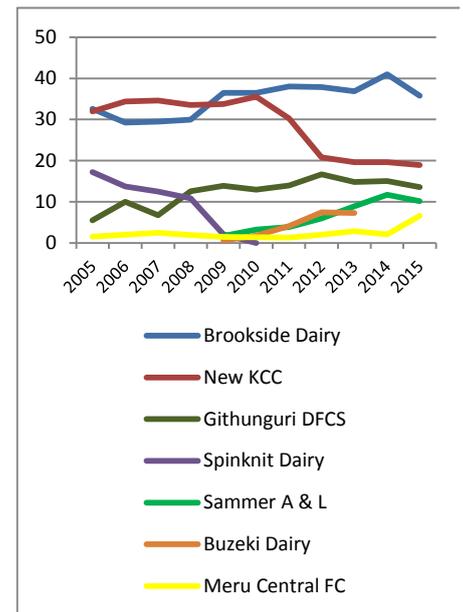
b) Trends in market concentration

Table 1 shows concetration ratios (CR) and the HHI for the industry from 2005 to 2015. CR_n inidacates the market share (based on milk intake) contolled by the top n firms.

Table 1. Concentration measures in the Kenya dairy processing industry

Year	CR_1	CR_2	CR_3	CR_4	HHI
2005	33	65	82	87	0.24
2006	34	64	77	87	0.23
2007	35	64	77	83	0.23
2008	34	64	74	87	0.23
2009	36	70	84	86	0.27
2010	36	72	85	88	0.28
2011	38	68	82	86	0.26
2012	38	59	75	81	0.23
2013	37	57	71	80	0.21
2014	41	61	76	87	0.24
2015	36	55	68	78	0.20
Av.	36	63	77	85	0.24

CR_1 ranges from a low of 33% in 2005 to a high of 41% in 2014, with a mean of 36%. This means that at any one time from 2005-2015, the market leader

controlled about 36% of the market, which is more than a third. The two largest processors controlled an average of 63% of the market in those 11 years while the 3 largest controlled 77%. All CRs peaked in the years 2009-2010 before gradually slowing down and then falling further in 2015.

The HHI is a measure of concentration for the whole industry. It ranges from 0 to 1, with 0 depicting a market with many but very small firms and 1 a pure monopoly or monopsony. According to international practice, HHI below 0.15 indicates low concentration, HHI between 0.15 and 0.25 indicates moderately concentrated markets, and HHI above 0.25 highly concentrated markets (Perekhozhuk et al., 2014). At an average of 0.24, the dairy processing industry in Kenya is moderately concentrated. In the years 2009-2011, the industry was highly concentrated with the HHI being more than 0.25.

c) Trends in milk prices

Figure 2 show average milk prices paid by processors in Ksh per liter. Nominal prices paid have increased from a low of Ksh 16/liter in 2005 to an average of Ksh 36.2 in 2015. While this may seem like an increase, the real prices have actually decreased.

**Fig 2. Trends in produce milk prices in Ksh/liter.**
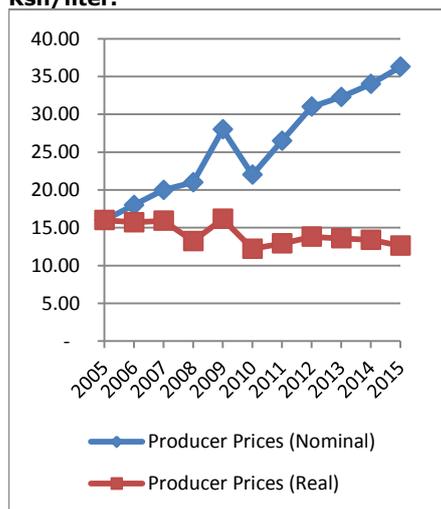
We used the consumer price index (CPI) to adjust the prices to real ones with 2005

as the base year. Real prices have actually fallen from Ksh 16 observed in 2005 to about Ksh 12.6 in 2015. This means that farmers are actually receiving less when the prices are adjusted to account for the effect of inflation.

d) Correlating market concentration and milk prices

Figure 3 shows a graphical analysis of real producer milk prices and HHI. For the purpose of this presentation and to allow visual comparison with HHI, prices are shown in Ksh/10 ml of milk (per liter prices divided by 100).

Fig 3. Real milk producer prices and HHI (2005-2015)
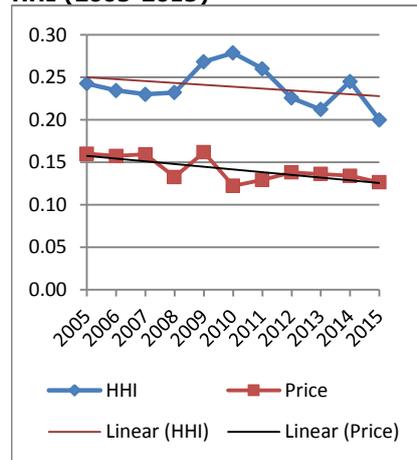
The graph shows that real prices and HHI have fallen overtime, especially since 2009. However, prices have fallen more sharply with the linear line for price having a bigger slope. Simple correlation analysis indicates a negatives correlation coefficient, which may seem to suggest that a rise in HHI is associated with a decrease in milk prices. However, this coefficient is not statistically significant hence we can not make this conclusion.

Conclusions

Our results shows several changes in market structure. New KCC was the market leader until 2009 when it was dislodged by Brookside. Overtime, the gap between the two in terms of market share has widened. Since 2009, Githunguri dairy has maintained the

third position with a market share ranging from 14-17%.

At any one time from 2005-2015, the market leader controls more than a third of market (av.36%). In the same period, the two largest processors controlled an average of 63%. Using the HHI, our calculations show that the dairy processing industry in Kenya is moderately concentrated at an average HHI of 0.24. The industry was highly concentrated in 2009-2011 and this is the time when Brookside bought out Spin Knit Dairy and overtook New KCC.

A look at the trends in nominal milk prices paid by processors shows an increase overtime. When prices are deflated using CPI to adjust for inflation, we observe that real prices have actually fallen.

Results further show that real prices and HHI have fallen overtime, but prices have fallen more sharply. Correlation analysis yields a negative but insignificant coefficient, meaning that we can't conclude a relationship.

Recommendations

1. Ways of ensuring famers recieve increasing real producer milk prices should be explored.
2. It is important to regularly monitor changes in market structure in agribusiness industries and relate them to welfare indicators to prevent undesirable practices of highly concentrated markets.
3. Since a low concetrated market is desirable, it is important to address entry challenges to encourage more players in the industry.
4. More rigorous analysis should be undertaken to ascertain if the moderately concentrated processing industry has a significant relationship with both producer and consumer prices. The analysis should be expanded to include the informal marketing sector which controls majority of marketed milk.

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