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MARKET POWER OF COOPERATIVES –A LIVELIHOOD ENHANCEMENT APPROACH: EMPIRICAL EVIDENCE FROM ETHIOPIA

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Abstract
This paper examines whether cooperatives in Ethiopia exercise market power or not and investigates the factors that influence market power. In order to examine the extent of competition among market agents, market share is taken as proxy indicator of market power. A standard analytical tool, namely, Herfindahl index is employed to analyze the degree of market concentration within the defined marketplace. On top of this, binary logit has been employed to analyse determinants of market power. A threshold of 35% is used as a barometer to determine the existence of market power in the industry. Accordingly, the study shows that the share of cooperatives is significantly low indicating that the market is dominated by non-cooperative firms. Result from logistic regression also shows that out of the total eleven variables included in the model only five of them are found to have statistically significant partial effect on the market power of cooperatives. The finding indicates that poor capital, low access to market information, poor control and decision over strategic resources coupled with high marketing cost and low purchasing have contributed cooperatives to have low market share and weak market power. In order for cooperatives to have balanced power and thereby contribute much to members' livelihood, cooperatives must be vibrant and competent on one hand and build their institutional capacity through broadening their financial base, improving information networks, and member education on the other hand.

Key words: Cooperatives, Market power, Livelihood.

Introduction

Globally, exploitation of farmers by other actors in the market still remains a serious challenge because of a number of limiting factors and weak bargaining position in the market. The study made by Ken (ND) pointed out that individual farmers are at a disadvantage in buying farm supplies and selling farm products. In line with this, poor infrastructure, shortage of capital, access to support from business service providers, technology, lack of domestic interaction, intense competition and gaining low benefits due to inequality in the chain governance coupled with absence of legitimate incentive are the major constraints for low bargaining and market power (Schmitz 2005; Arrow and Intriligator, 2001). Cooperatives in Ethiopia are also suffering from similar problems and challenges in a much deeper way.

The response to this imperfection is the establishment of proactive, dependable and efficient institutions as rightly stated by Dalton in 1982. The entire aim of any development effort is to correct such market failure for enhanced livelihood and reduced poverty. To this end, cooperatives as one of development institutions play a prominent role in impacting household livelihood. Research has shown that cooperatives can be as efficient as possible and operate at cost levels lower than their proprietary counterparts (Richard et al., 2005); when operating this way only that the existence of a cooperative in a market will force profit-maximizing firms to behave more competitively. The study made by Lucila et al. (2006) also has come up with the empirical finding justifying that cooperatives, above all, provide for the exercise of market power by their members through collective negotiations with suppliers or buyers, by controlling or withholding member supply into the market, and by informing members about prevailing terms of trade. Kenkel et al. (2006), in their study revealed that cooperatives have unique potential for economic benefits.

The 2005-2010 poverty reduction strategy of Ethiopia, called Plan for Accelerated and Sustained Development to End Poverty (PASDEP), has also focused on accelerating agricultural transformation through cooperatives to enhance livelihood and reduce hunger and poverty. The package for interventions envisaged under PASDEP for achieving this goal above all include the improvement of marketing system through better access to rural infrastructure which links producers to market and thereby improve market efficiency and bargaining power that ultimately enhance livelihood (ADB and ADF, 2006). Cooperatives in Ethiopia were primarily designed as a response to such strategy with the intention to alleviate members' economic ills as well as to play significant role in improving agricultural marketing system that enhance household livelihoods. Despite such efforts and commitment, the fact on the ground in Ethiopia a decade before and even at present is to the contrary. The study made by SNV -Ethiopia (2005), revealed that cooperatives in Ethiopia are generally weak and inefficient. Their commercial prospects are limited. Besides, their competitiveness is less as compared to traditional grain traders. Owing to the fact that they are not profit oriented enterprises and have poor interaction with other chains, cooperatives are not well developed. Study by Bezabih (2005) also indicated that the average marketable surplus in Ethiopia is not more than 28% of the total production, even in good harvest year. The same study shows that cooperatives handle only

less than 5% of the grain traded in Ethiopia. As a result they are not able to gain a lot from the market. Even this limited amount of marketable surplus reaches the market place passing a chain of intermediaries that unnecessarily increases the marketing cost and makes the consumer price extremely high. This situation again has a negative impact on both the income of the farmer and on the consumer welfare and threatens household livelihood and exacerbates the incidence and intensity of rural poverty.

This study, therefore, attempts to give an answer to such an open question. To this end, the present study tries to examine the degree to which cooperatives in Ethiopia exercise market power in the supply chain system and to identify key factors influencing cooperatives market power that ultimately hamper members' livelihood.

Materials and Methods

Sampling procedure

The sampling frame is the total households who are members of agricultural cooperatives found in the area. Purposive sampling technique is used to select two sample agricultural cooperatives found in major wheat growing areas. Then proportion to size probability sampling procedure is employed to draw samples from the sampled cooperatives. Finally, a total of 138 households are taken using simple random sampling technique from the sample frame.

The sample size is determined using a formula, $n= z_{cl}^2 * \frac{p(1-p)}{e^2}$ …… (1)

where: e=acceptable sample error of 5%,
p= 10% which is estimate of the proportion of households who are members of a cooperative, z=1.96 at 95% cl, (Zikmund, 2005).

Data Set

In order to meet the objectives of this study, data is collected from both primary and secondary sources. Survey method is applied to collect primary (administering an interview schedule) to data on determinants of cooperative market power. Structured survey questionnaire is prepared in English and carefully translated in to the local language "Afan Oromo", and is tested prior to the actual survey. Five years data are collected from secondary sources to answer questions related to the degree to which cooperatives exercise market power in supply chain system.

Method of Data Analysis

In order to analyze the data both quantitative and qualitative methods are employed. Descriptive and econometric models are employed to analyze quantitative or survey data. Herfindahl-Hirschman Index (HHI) is also used to find out the extent of concentration.

Definition of variables and Modeling

In this study, the dependent variable is "market power of cooperatives". It takes binary numbers (1, 0). For variables with binary responses, binary logistic regression is usually proposed (Gessner and Colleagues, 1988, cited in Gary et aI., 2005). Accordingly, binary logit[1] is used to analyze the determinants of market power.

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[1] *The model is given as:* $$p_i = \frac{e^{Y_i}}{1+e^{Y_i}}$$

Where, P_i: is the probability that the market power of the i^{th} cooperative is positively influenced by explanatory variables

Y_i: is a function of n explanatory variables which is expressed as:

$$Y_i = \ _o + \ _1X_1 + \ _2X_2 + \ldots \ _nX_n + £_i$$

Where, $£_i$: error term, $_1$, $_2$,... $_n$ are the logit parameters of the equation in the model.

To check the robustness of the model, different methods such as the classification table, Hosmer and Lemeshow test, and goodness of fit of the model are used. Besides, multicollinearity test is employed with the help of coefficient of contingency. Wald Chi-square test is also employed to assess the statistical significance of each of the explanatory variables.

To *measure the degree of market power*, Herfindahl-Hirschman Index (HHI)[2] is used.
In this study, variables that are assumed to influence market power are used as explanatory variables. For most of these variables cannot be measured quantitatively, we proximate them with dummy variables based on the perceptions of individuals, in a formal survey. Creating a logistic[3] regression model using partly or exclusively dummy variables provides three distinct advantages (Garavaglia and Sharma, 2008).

Results and Discussion

Model Fitness

In this study, Hosmer and Lemeshow test is used to accept or reject the null hypothesis that "the model does not adequately describe the data". Accordingly, since ψ^2 (7, N=116) =6.631and its ρ=.468, the null hypothesis is rejected justifying the model is statistically significant to adequately describe the data. Moreover, the classification table shows that the model is able to correctly classify 56.9 percent of those members of the cooperatives who agreed that their cooperative has market power and 83.1 per cent who disagreed, for an overall success of 71.6 per cent. By and large, multicollinearity test shows weak association between explanatory variables with a maximum c value of 0.403 for the explanatory variables "access to market information and control and decision of strategic resources".

Market share and Market Power

Five years (2010-2014) data are collected from secondary sources to analyze the market share of each firms operating in wheat market supply chain. Three firms participated in the market. The five years aggregate analysis reveals that the market share of cooperatives is 5 per cent while that of other firms as well as whole sellers is 44 per cent and 51 per cent respectively. Sanderson and Tepperman (2007) suggested that firms with market share exceeding a threshold of 35 per cent are dominant in the market place. On the basis of this, the study indicates that these two firms possess significant market share (Figure-1). Moreover, the HHI for the last five years is 4562. This empirical finding indicates the dominance or monopoly of a single firm in the industry, resulting in a decrease in competition and market efficiency. The study also indicates that since the market share of the cooperatives are so small, they have lost market power. As a result, the assumption that cooperatives play competitive yardstick to correct market failure by forcing other firms to behave competitively has failed (Table-1). This aggregate analysis confirms that whole sellers enjoy higher degree of market power, while cooperatives' share is so small denoting that they have lost their market power that ultimately threatens members' livelihood.

The coefficient shows how the log odds in favour of the market power of cooperatives changes as the value of explanatory variables change. The value Pi, is the probability that the market power of cooperatives is positively influenced by explanatory variables, and the odds ratio being $P_i / (1- P_i)$.

[2] *The Herfindahl index, HHI[2], is given by the sum of the squared shares. With k firms, the model is given as:*

$$HHI = S_1^2 + S_2^2 + S_3^2 + \ldots + S_k^2 = \sum_{i=1}^{k} Si^2$$

Where, $Si = \frac{qi}{Q}$, *the share of the* $_i^{th}$ *firm in the market and, i=1, 2...k.*

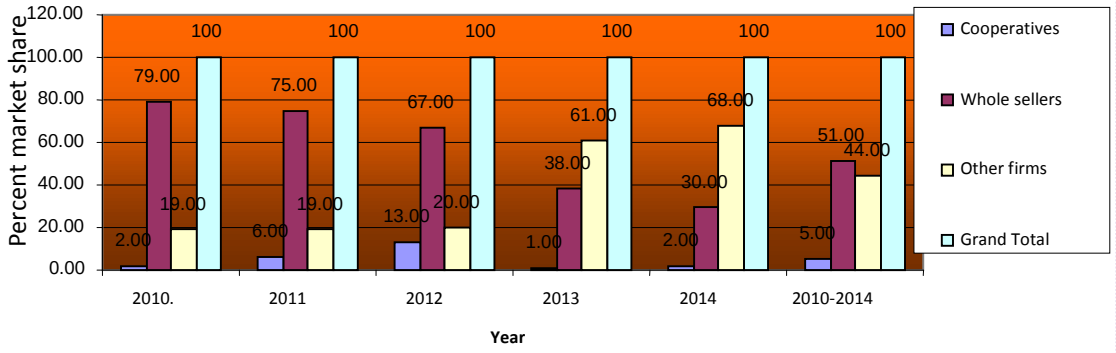
[3] One of the advantages is that it helps the calculation, understanding and interpretation of odds ratio simple while it increases the stability and significance of the coefficients. On the other, in addition to the direct benefits to statistical analysis, representing information in the form of dummy variables makes it easier to turn the model into a decision tool. The last but not the least is that, in addition to the benefit of flexibility, the elementary statistics (e. g., mean and standard deviation) for dummy variables have interpretations for probabilistic reasoning

Determinants of Cooperative Market Power

Eleven explanatory variables are considered to explain the cooperative market power. Employing 5 per cent criterion of statistical significance, out of the total eleven variables included in the model only five of them (i.e. access to market information (MARKINFN), marketing cost (MARKCOST), marketable surplus channeled through cooperatives (PCTCHANC), control and decision of strategic resources (CONTDSR) and share capital contribution (CAP)) have statistically significant partial effect on the market power of cooperatives. Since other explanatory variables do not statistical significance they are not dealt with (see Table-2).

Market share which is an indicator of market power is influenced by the volume of marketable surplus products channeled through cooperatives. If quantity channeled through cooperatives increases so does market share. On the other hand, volume of marketable surplus depends highly on the availability of cooperatives' capital. The effect of capital on market share and market power is so high as compared to other significant explanatory variables. The empirical study indicates that 80.4 per cent of the members of cooperatives contributed less than the average towards share capital. This signifies that the capital of cooperatives which relies on internal funding is so low. This low capital brought about cooperatives to purchase and resale only small quantity of marketable surplus resulting in market share as low as 5 per cent compared to rivals whose concentration ratio or market share is as high as 95 per cent in the market place. Besides, factors such as access to market information, marketing cost, quantity of wheat channeled through cooperative, and control and decision of strategic resources have statistically significant positive, and/or negative effect on the market power of cooperatives.

Figure-1: Firms market share (2010-2014)



Source: Authors' estimation, 2015

Table-1 Market Share and Herfindahl-Hirschman Index, HHI

Major suppliers	2010		2011		2012		2013		2014		2010-2014	
	Market share (Si)	S_i^2	market share (Si)	S_i^{24}	market share (Si)	S_i^2	market share (Si)	S_i^2	market share (Si)	S_i^2	market share (Si)	S_i^2
Cooperatives	2	4	6	36	13	169	1	1	2	4	5	25
Wholesalers	79	6241	75	5625	67	4489	38	1444	30	900	51	2601
Other firms	19	361	19	361	20	400	61	3721	68	4624	44	1936
HHI[5]		**6606**		**6022**		**5058**		**5166**		**5528**		**4562**

Source: Authors' estimation, 2015

Table-2: Logistic Regression Result of Partial Effect of Explanatory Variables

Variables	B	S.E.	Wald	df	Sig.	Exp (B)	95.0% C.I. for EXP (B)	
							Lower	Upper
PRICE	-0.611	0.44	1.924	1	0.165	0.543	0.229	1.287
MKT InFo*	1.845	0.612	9.074	1	0.003	6.327	1.905	21.011
CAPITAL***	0.887	0.526	2.847	1	0.092	2.427	0.867	6.799
ST RESOURCE***	-1.295	0.735	3.109	1	0.078	0.274	0.065	1.156
MKTCOST*	-1.389	0.506	7.527	1	0.006	0.249	0.092	0.673
MKTSURPLUS**	-1.149	0.532	4.666	1	0.031	0.317	0.112	0.899
Constant	0.812	0.533	2.324	1	0.127	0.317		

* Significant at 1%; ** Significant at 5%; *** Significant at 10%

Source: Authors' estimation , 2015

Conclusions and Policy Implications

Failure to receive members' product by cooperatives due to poor working capital has greatly affected member patrons to benefit from competitive prices. Thus, this phenomenon erodes members' reliance on their cooperatives and significantly threatenes the likelihood of cooperatives to correct market failure. This situation critically dictates and worsens members' livelihood and welfare as well. Moreover, poor access to market information, low control and decision of strategic resources and high marketing cost of cooperatives are some of the empirically tested key explanatory variables contributes and results in low cooperatives' market power that ultimately have a negative bearing on members' livelihood in the study area.

Regarding policy implications, farmers' organizations must institutionally be strong enough to face unfair competition and influence other firms to behave competitively in the market place. This can be achieved through self review of their role to enhance members' livelihood. First, cooperatives must decide on their appropriate role in the marketing system by carefully examining their strengths and weaknesses to discover their advantages over their competitors and must translate those advantages into specific actions. Second, cooperatives should be committed to develop a sound and practical marketing system. Third, to build toward future success, cooperatives must be willing to consider change, be imaginative and creative, and take a leadership role. Fourth, the cooperative promoters and support system providers should work towards capacitating farmers' institutions to enable them increase their market share and thereby restore their lost market power in the market place. Fifth, government should interfere either by increasing the influence of cooperatives through building countervailing power or through taking regulatory and legal measures to maintain competitive conditions. Sixth, there must also be strong linkage and network among vertical and horizontal chain actors to help fight against the abuse of market power and unfair trading practices so as to exploit the market opportunities, minimize market risks and maintain equitable power balance. Apart from these, the relationship between cooperatives and member patrons must be strengthened to enhance member's commitment and integrity in order to bring about real participation, sustainable growth and thereby ensure their common benefits and livelihood conditions.

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