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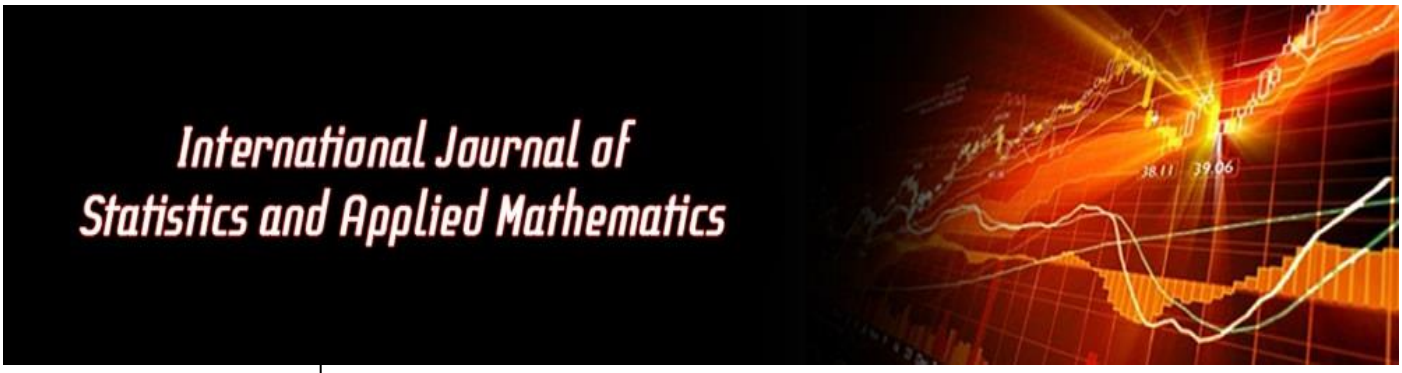

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Structure conduct performance of farmer producer organisations in Krishna district of Andhra Pradesh

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Abstract
Farmers Producers Organization (FPO) is the emerging paradigm for emerging farmers socially into organized groups, so that they can collectively involve in agricultural supply and value-chain operations. The Structure Conduct and Performance model (SCP) has been used to provide an analytical framework for understanding the relationship between the Structure, conduct and performance of Farmer Producer Organisations in Krishna District. Efficiency is measured to discern the performance of FPOs by using Data Envelopment Analysis (DEA) by taking constant returns to scale. Gini concentration ratio is used to measure the conduct of FPO. The results showed that the performance of FPOs increases with increase in the efficiency of FPO. Sample FPOs found to have strong equity base and are financially stable. The experience and external linkages would increase with increase in age of FPO and this enhances the performance.

Keywords: FPO, SCP, DEA and Gini's concentration ratio

Introduction
Agriculture plays a pivotal role in developing economies. Small and marginal farmers account for 85% of the total operational land holdings in India (Agriculture census, 2011). The small farmers with weak bargaining powers suffer from greater dependency in the cultivation and monopolistic exploitation under formal contracts (Bachke, 2009) [2]. To minimize the gap between the farmers and consumers, Government of India aimed at new institutional options which can provide the farmers, a level playing field to compete in the modern agro food networks. With the recommendations of Y K Alagh Committee in 2001, amendments were brought to the Companies Act, 1956 which paved the way for the concept of 'Producer Companies' (PC). PC can increase the skills, revenue and bargaining power of the smallholder farmers in the production and marketing of the produce. They disseminate technical knowledge to its beneficiaries, improve their production efficiency, reduce the transaction costs, market the final produce and are even successful in capacity building thereby, fabricating the social capital.

In the era of globalization and climate change, producer organizations are regarded as the only institutional option to safeguard the best interest of the farmers and facilitate them to reach a higher level of profits through novel agro-food networks (Anika and Markus 2012) [1]. SFAC (Small Farmers Agribusiness Consortium) acting as a single window for technical advice, training needs, research and knowledge management and investment needs providing all round support to State Governments and FPOs. Producer Organization Development Fund (PODF) has been created by NABARD to specially promote the FPOs which lie outside the ambit of SFAC. As a major reform, GOI has announced cent percent tax holiday for all the FPOs below 100 crores up to five years.

The FPOs have the potential to provide secure equitable and sustainable livelihoods to the farmers and can evolve as a major step towards doubling of farmers' income in India. In the recent years, there has been a growing interest in promoting a facilitating environment for FPOs so that they stand up as successful business enterprises ensuring the success of small and marginal farmers in the country. A research study focussing on the structure, conduct and performance of existing FPOs helps to identify the areas that need attention and focus on for making them as successful business enterprises.

There is a large scope for setting up of single or multi-commodity FPOs with strong intra/inter linkages between the villages in a mandal of the Krishna district in Andhra Pradesh. The major crops grown in the district are rice, black gram, cotton, maize, chillies, fresh fruits and aromatic flowers together occupying nearly 86.81% of the total gross cropped area. The FPOs in the district have turned the COVID crisis and lockdown into an opportunity to take their produce to consumers' doorsteps. In view of the above, the study has been undertaken with an objective to comprehend the structure conduct and performance of Farmer Producer Organizations in Krishna District of Andhra Pradesh.

Structure of FPO

It is formed by a group of producers for either farm activities or non-farm activities which form into clusters from different villages and form into an organization for marketing their produce. They share the profits among the members. Each FPO will have an elected board of management/Board of directors as per the bye-laws. The board can engage professionals to manage its affairs. In the initial years, professionals and managerial assistance is usually extended by Producer Organisation Promoting Institution (POPI). As the leaders of FPO gain experience, they should take over the affairs of FPO completely. The structure of Board of directors includes CEO, marketing manager, finance and accountant, service providers and Kisan Mitra.

Methodology

Sampling Procedure

There are 98 FPOs which were registered and functional in Andhra Pradesh and are functioning under Small Farmers Agribusiness Consortium (SFAC) and National Bank for Agricultural and Rural Development (NABARD). Out of these 98 FPOs, Krishna district is having maximum number of FPOs (16) and hence Krishna district has been selected purposively for the present study.

Selection of FPOs

Out of 16 Registered and functional FPOs in the district, two FPOs with maximum membership and two FPOs with minimum membership are selected purposively. The selected FPOs belong to Vijayawada and Nuzvid revenue divisions. In Vijayawada revenue division, Sri Vigneswara FPO (600 members) of Thotlavalluru mandal, Chandragudem FPO (300 members) of Mylavaram mandal and Baji Baba FPO (223 members) of Nandigama mandal were selected for the study. In case of Nuzvidu revenue division, China Ogirala FPO (580 members) of Vuyyuru mandal was selected for the study.

1. Sri Vigneswara Farmer Producer organization

Sri Vigneshwara Banana FPO is located at Chagantipadu village, Thotlavalluru Mandal, Krishna district with 600 active members. The FPO has been registered 3 years ago.
It has been started with a share capital of Rs 1, 00,000 with the help of NGO (Nestham) and NABARD.

2. Chandragudem farmer's producer's organization

Chandragudem Jasmine Producer Company Ltd, is located at Chandragudem, Mylavaram mandal, Krishna district with 300 active members. The FPO has been registered 3 years ago. It has been started with a share capital of Rs 1,00,000 with the help of NGO (Nestham) and NABARD.

3. Baji Baba Farmers producer Organizations

Baji Baba Producer Company Ltd, is located at Pedda cheruvu kommu palem, Nandigama mandal. Krishna district with 223 active members. The FPO has been registered 3 years ago.It has been started with a share capital of Rs 1,00,000 with the help of NGO (Nestham) and NABARD.

4. China Ogirala Farmers producers Organizations

China Ogirala vegetables FPO is located at China Ogirala village, Vuyyuru mandal, Krishna district, with 580 active members. The FPO has been registered 3 years ago. It has been started with a share capital of Rs 1,00,000 with the help of NGO (Nestham) and NABARD.

SCP model

The traditional structure-conduct-performance (SCP) approach has been first developed by Mason (1939) [11] and Bain (1951) [3]. The empirical studies conducted to test the SCP approach, have shown that there is a positive relationship between firm performance and market concentration. To explain the underlying reason behind the relationship between firm performance and market concentration, two main hypotheses have been put forward: The first hypothesis called "the collusion hypothesis" developed by Bain (1951) [3]; the second one was "efficient structure hypothesis" due to Demsetz (1973) [4].

The basic premise of the collusion hypothesis is that collusion among firms in markets with high concentration ratios is high (Bain, 1951) [3]. The collusion among firms will lead to an increase in prices of services provided and thereby it will result in the acquisition of excess profits in the market. As a result, this will lead to weakening of the market's competitive structure and appearance of imperfect competitive market structure. In addition, when market shares of the companies increase, this will lead to an increase in concentration ratio and cause the level of competition to decrease.

The FPO structure is measured with the help of concentration ratio. The concentration ratio can be measured by using Herfindahls-Hirschman Index (HHI) and Gini concentration ratio. The Gini index, also known as gini concentration ratio was used which is the most commonly used statistical index in social sciences for measuring the concentration of a positive random variable. It is used as a measure of inequality in the distribution of farmers among the FPOs. It is used to indicate how the distribution of farmers in the four FPOs has changed in Krishna district from 2016-17. The coefficient ranges from 0 to 1, with 0 representing perfect equality and with 1 representing perfect inequality.

$$G_1 = 1 - \sum_{k=1}^{n} (X_k - X_{k-1})(Y_k + Y_{k-1})$$

X_k is the cumulated proportion ofnumber of FPOs, for k = 0,n, with $X_0 = 0$, $X_n = 1$.

Y_k is the cumulated proportion of thenumber of farmers in FPO, for k = 0, n, with $Y_0 = 0$, $Y_n = 1$.

Conduct

Conduct of FPO is measured with the help of Market share. Market Share is the share of i^{th} firm in time period t. The proportion of market that the firm is able to capture can measure the firm's performance relative to competitors. This proportion is referred to as the firm's market share. Market share is often associated with profitability and thus the firm may seek to increase their sales relative to competitors. Market share is estimated by dividing individual firms revenue divided by total industry revenue.

Performance

Efficiency is the measure of the performance of FPOs. This efficiency is calculated by using Data Envelopment Analysis (DEA). DEA is a data oriented approach for evaluating performance of similar units. It involves converting multiple inputs to multiple outputs. It is a very useful methodology because one can find the relationship between multiple inputs and outputs even without specifying mathematical model explicitly. This was done by using DEA 2.1 software.

Efficiency of FPO examines the ability of FPO to turn the inputs of operation into outputs. It is easy to measure efficiency level for one input and one output, when the number of inputs and outputs are greater than one it becomes very difficult to measure efficiency scores. In such cases, the linear programming methods are employed to measure the efficiency scores, but the DEA model that allows the measurement of efficiency when there are more than one input and output is developed by Charnes *et al*. (1978) [12]. DEA is a non-parametric technique that is used in construction of empirical production frontier and evaluation of performances of homogenous Decision Making Units (DMU's). In our analysis, DMU's are FPOs which use more than one input to produce multiple outputs. In the analysis, assuming that the number of DMU's is *n* and each of these units use *m* inputs and *s* output, the mathematical representation of DEA model can be written as (Lovell, 1993) [13]

DEA model

$$\text{Max } h_c = \frac{\sum_{r=1}^{s} u_r y_{rc}}{\sum_{i=1}^{m} v_i x_{ic}}$$

$$\frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1$$

$$U_r, v_i \geq 0$$

R = 1, 2, …….s; i = 1, 2,…….m; j = 1, 2,…….n.

Where, *c* represent the DMU that its efficiency level will be evaluated, y_{rj} is the FPO j's r^{th} output, x_{ij} is FPO j's i^{th} input, u_r and v_i are the weights that will be obtained from solving the model corresponding to input *r*'s and output *i*'s respectively. Model involves the maximization of objective function h_c's, DMU *c*'s weighted output to weighted inputs ratio, including itself under the restriction of no one DMU ratio is greater than one. The weights of u_r and v_i in the model is obtained with optimization. To solve the optimization problem given in model, h_c's denominator is equated to one thereby turning the problem into linear programming. Corresponding model suitable to linear programming can be written as:

$$\text{Max u, v } hc = \sum_{r=1}^{s} u_r\, y_{rc}$$

$$\sum_{i=1}^{m} v_i\, x_{ic} = 1$$

$$\sum_{r=1}^{s} u_{rc} y_{rj} - \sum_{i=1}^{m} v_{ic}\, x_{ij} \leq 0$$

$$u_r, v_i \geq 0$$

r = 1, 2…….s; i = 1, 2……m and j = 1, 2…….n

In model, it is assumed that constant returns technology is employed in the optimization problem and the weighted average of inputs is equal to one and outputs are maximized. This formulation of the DEA model is called input oriented efficiency measurement and indicates that FPOs try to minimize inputs given the output.

Dual model;

$$\min hc = \theta c$$

$$\sum_{j=1}^{n} \lambda_j\, y_{rj} - s_i^{+} = y_{rc}$$

$$\sum_{j=1}^{n} \lambda_j\, x_{ij} + s_i^{-} = \Theta_c x_{ij}$$

$$\lambda_j,\ s_i^{+},\ s_i^{-}, \geq 0$$

j= 1, 2,……n

The values of θ*c* scores obtained solving the model is equal to one and the slacks s_i^{+} and s_i^{-} is equal to zero, FPO *c* is called efficient. The efficiency of FPO implies that it is impossible for the FPO to achieve the given output level using fewer inputs. If θ*c* is smaller than one, these FPOs are called less efficient than the benchmark reference FPOs and the value of θ*c* indicates the extent that FPO *c* needs to reduce input usage to reach efficiency.

In this study, the output efficiency model was used to calculate the efficiency of ith sample FPO in each production system and is expressed as follows.

$$\min_{\Theta\lambda} \Theta_i$$
$$\lambda_1 Y_1 + \lambda_2 Y_2 + \lambda 3Y3 + \lambda_4 Y_4 \geq Yi$$
$$\lambda_1 X_{11} + \lambda_2 X_{12} + \lambda_3 Y_{13} + \lambda_4 X_{14} \geq \Theta_i X_{1i}$$
$$\lambda_1 X_{21} + \lambda_2\, X_{22} + \lambda_3 Y_{23} + \lambda_4 X_{24} \geq \Theta_i X_{2i}$$
$$\lambda_1 X_{31} + \lambda_2 X_{32} + \lambda_3 Y_{33} + \lambda_4 X_{34} \geq \Theta_i X_{3i}$$
$$\lambda_1 X_{41} + \lambda_2 X_{42} + \lambda_3 Y_{43} + \lambda_4 X_{44} \geq \Theta_i X_{4i}$$
$$\lambda\ (\lambda_1,\ \lambda_{2,}.\ \lambda) \geq 0$$

The analysis has been done for the four selected FPOs taking net profit as output (Y_i) and labour (X_1) used in FPOs for loading and unloading, capital (X_2) which is taken from the balance sheet of FPO, overall fixed costs (X_3) i.e., the costs incurred during the infrastructure development and overall variable costs (X_4) as input variables for a period of 2 years.

To test the SCP approach for the FPO, the augmented version of the Smirlock (1985) [7]'s empirical model given in the Equation (1) was used. High efficiency in a sector leads to high market share and it causes to high concentration in the sector." For this reason, market share can be considered as a measure of efficiency (Smirlock, 1985) [7]. However, using market structure as a proxy for efficiency in empirical analysis has been heavily criticized and it was argued that efficiency should be measured and used directly in empirical analysis. The main reason for using efficiency measures directly in testing collusion and efficiency market hypotheses is related to the interpretation problem that the traditional specification involves: Shepherd (1986) [8] for example argues that market share only reflects market power. However Smirlock (1985) [7] interprets high market share as a signal that the most efficient firms have low costs and earn market share. In this sense, market share can be considered as a proxy to efficiency. The FPO subject to empirical analysis is provided in the Equation 1 below. This model was estimated using the FPO data collected for the period 2015-2017. The data is obtained from the balance sheets of 4 FPOs operating during the sample period continually (Tuncay and Muhittin, 2016) [10].

Econometric model

$$\Pi_{it} = \beta_0 + \beta_1 CR_{mi} + \beta_2 MS_{it} + \beta_3 EFF_{it} + \beta_4 EAR_{it} + \beta_5 L\ Risk + \beta_6 PFM_{ij} + \beta_7 age_{ij} \quad (1)$$

CR is the concentration ratio of the FPO. Market Share is the share of i^{th} firm in time period t. The proportion of market that the firm is able to capture can measure the firm's performance relative to competitors. This proportion is referred to as the firm's market share. Market share is often associated with profitability and thus the firm may seek to increase their sales relative to competitors. Market share is estimated by dividing individual firms revenue divided by total industry revenue

M Share = Revenue of FPO / Total revenue of 4 selected FPOs

EFF = Efficiency obtained from DEA

Equity to assets ratio (EAR) is total equity divided by total assets. The equity asset ratio measures the proportion of a company's total assets which are financed by the owner's capital rather than through debt, and therefore indicates the financial position.

EAR = Total equity / Total assets

Long term debt equity ratio (L Risk) is calculated by dividing long term liabilities by total equity and represents long term risk. This represents the total long term portion of borrowed money and measures the indebtedness of a company relative to invested capital.

L Risk = Long term liabilities / Total equity

Proportion of female in membership is the total percent of women members in the FPO. The heterogeneity in group membership shows positive relation with performance.

PFM = Proportion of females in membership

Age of FPO is the number years after the completion of registration. This may show positive relationship with performance.

Return on Assets (ROA) was calculated by dividing net income by total assets. This represents the percentage of profit the company earns in relation to its overall use of resources. It is an indicator of how profitable a company is relative to its total assets.

Π = FPO Profitability ratio (ROA)

In the Equation (1) above, π_i is used as a measure of FPO performance (ROA or ROE), MS denotes market share of firm *i*, CR_n represents concentration ratio and EFF shows efficiency scores measured directly for each FPO using DEA. The following section provides detailed information about how efficiency scores for each FPO has been measured. According to the coefficients obtained from Equation (1) given above, the hypotheses that will be tested to analyze the relationship between FPO performance and market structure can be summarized as follows

Collusion hypothesis

$$\frac{\partial \Pi}{\partial CR} > 0; \frac{\partial \Pi}{\partial MS} = 0; \frac{\partial \Pi}{\partial EFF} = 0 \quad (2)$$

Efficient structure hypothesis:

$$\frac{\partial \Pi}{\partial CR} = 0; \frac{\partial \Pi}{\partial MS} = 0; \frac{\partial \Pi}{\partial EFF} > 0 \quad (3)$$

Relative efficient structure hypothesis:

$$\frac{\partial \Pi}{\partial CR} = 0; \frac{\partial \Pi}{\partial MS} > 0; \frac{\partial \Pi}{\partial EFF} > 0 \quad (4)$$

Hybrid efficient structure hypothesis:

$$\frac{\partial \Pi}{\partial CR} > 0; \frac{\partial \Pi}{\partial MS} = 0; \frac{\partial \Pi}{\partial EFF} > 0 \quad (5)$$

The hypothesis given in Equation (2) represents the traditional collusion hypothesis (Bain, 1951) [3]. In other words, if the coefficients of $\beta 2 = 0$ and $\beta 3 = 0$ in Equation (1) and are statistically insignificantly equal to zero and the coefficient $\beta 1$ is significant and different from zero, then the Bain's collusion hypothesis holds in the market. The hypothesis given in Equation (3) represents the efficient structure hypothesis (Demsetz, 1973) [4]. In this case, while the coefficients $\beta 1 = 0$ and $\beta 2 = 0$, they are statistically insignificant, $\beta 3 \succ 0$ should be positive and statistically significant. If the estimation result shows that only $\beta 3$ is positive and statistically significant and different from zero, then it can be concluded that the efficient structure hypothesis holds in the market.

The hypothesis given in Equation (4) represents the relative efficient structure hypothesis (Shepherd, 1986) [8]. If this hypothesis is true, then it is expected that while β_1 is equal to zero, β_2 and β_3 should be positive and statistically significant in Equation (1). If this is the case, then, different from the collusion hypothesis in where all firms earn abnormal profits, those FPOs with high market share and differentiated services will have market power and earn excess profits. In this hypothesis, it is also assumed that like in the efficient market hypothesis, concentration is the result of high efficiency and in turn high market share.

The hypothesis given in Equation (5) is known as the hybrid efficient structure hypothesis. In this case, while the coefficient β_2 is zero in Equation (1), the coefficients β_1 and β_3 should be positive and statistically significant. Hence, we conclude that, according to this hypothesis, while the main determinant of FPOs profitability is efficiency, concentration seems to be the second factor that affects profitability. However, it is worth mentioning that market share has no effect on profitability according to this hypothesis.

Results and Discussion

Structure, conduct and performance: The traditional structure-conduct-performance (SCP) approach had been first developed by Mason (1939) [11] and Bain (1951) [3]. The empirical studies conducted to test the SCP approach have shown that there was a positive relationship between firm performance and market concentration. To explain the underlying reason behind the relationship between firm performance and market concentration, two main hypotheses have been put forward: The first hypothesis is called "the collusion hypothesis" developed by Bain (1952s); the second one was due to Demsetz (1973) [4] called the "efficient structure hypothesis."

Data envelopment analysis (DEA) was a data oriented approach for evaluating performance of similar units. Efficiency of FPO examines the ability of FPO to turn the

inputs of operation into outputs. It was easy to measure efficiency level for one input and one output, when the number of inputs and outputs are greater than one it becomes very difficult to measure efficiency scores. In such cases, the linear programming methods are employed to measure the efficiency scores and the DEA model allows measurement of efficiency when there are more than one input and output. In DEA, profit was taken as the output variable and labour mandays, overall variable costs (OVC), overall fixed costs (OFC) and Capital were taken as input variables. Then the efficiency of the FPOs for the two years 2015-16 and 2016-2017 were calculated by using DEA approach. The results obtained are shown in table 1.

The FPOs with efficiency less than one are said to be inefficient and indicates that the FPOs should reduce the usage of inputs to become efficient (Table 1). Among the four sample FPOs, Sri Vigneswara FPO found to be efficient in both the years. The Baji Baba FPO which was inefficient in 2015-16, became efficient in 2016-17.

Table 1: Efficiency scores of the FPOs in Krishna district

FPO Name	Efficiency using constant returns to scale	
	1st year(2015-16)	2nd year(2016-17)
Sri Vigneswara FPO	1.00	1.00
China Ogirala FPO	0.73	0.43
Baji Baba FPO	0.18	1.00
Chandragudem FPO	0.71	0.53

Efficiency scores were obtained using DEA.

These efficiencies are used in the econometric model specified below, to explain the SCP relationship. The data related to the four selected FPOs over the period 2015-2017 was used in the analysis. The data was collected from Balance sheets of selected FPOs.

$$\Pi_{it} = \beta_0 + \beta_1 MS_{it} + \beta_2 EFF_{it} + \beta_3 EAR_{it} + \beta_4 L\ Risk + \beta_5 x_{ij}$$

MS – Market share was share of each FPO and measured by dividing revenue of FPO to total revenue of the four selected FPOs.

EFF- EFF was the efficiency scores obtained by using the DEA analysis.

EAR – EAR was measured by dividing total equity to total assets.

LRisk – Long term debt equity ratio was measured by dividing the long term liabilities to total equity.

X_{ij} was Proportion of female in membership and age of the FPOs.

Table 2: Market share of FPOs

FPO	2016	2017
Sri Vigneswara FPO	0.84	0.74
China Ogirala FPO	0.09	0.07
Baji Baba FPO	0.01	0.07
Chandragudem FPO	0.05	0.10

Table 3: Equity assets ratios of FPOs

FPO	2016	2017
Sri Vigneswara FPO	0.44	0.49
China Ogirala FPO	0.53	0.66
Baji Baba FPO	0.72	0.75
Chandragudem FPO	0.60	0.72

Table 4: Long term Risk of FPOs

FPO	2016	2017
Sri Vigneswara FPO	0	0.07
China Ogirala FPO	0	0
Baji Baba FPO	0	0
Chandragudem FPO	0	0.05

The concentration ratio was measured by dividing the number of FPO members to total number of FPO members in the selected four FPOs. The concentration can also be measured by using gini concentration ratio. Gini index, also known as gini concentration ratio was probably the most common statistical index employed in social sciences for measuring the concentration of a positive random variable. The concentration ratios and Gini values were presented in table 5.

Table 5: Concentration ratios of FPOs

FPO	2016	2017
Sri Vigneswara	0.30	0.35
Baji Baba	0.24	0.13
China Ogirala	0.24	0.34
Chandragudem	0.21	0.17
Ginis concentration ratio (G)	0.06	0.18

The results from table 5 showed that the market concentration had been increased from 2016 to 2017 in case of Sri Vigneswara and China Ogirala FPOs i.e. 0.30 for the year 2016 and 0.35 for the year 2017 and 0.24 for the year 2017 and 0.34 for the year 2017 respectively. A common measure of inequality is the Gini co-efficient or Gini index. The Gini value is typically lower in 2016 compared to 2017 showing that there was decrease in inequality in the distribution of farmers i.e., from 0.06 in 2016 to 0.18 in 2017.

Table 6: Regression estimates of SCP Dependant Variable Return on Assets (ROA):

Variables	B- coefficients	Standard error
Efficiency scores obtained from DEA	12.25**	0.67
Market share	42.70**	1.00
EAR (Equity assets ratio)	145.90**	4.19
L Risk (long term debt Equitty ratio)	-273.49**	7.44
Age of FPO	15.3**	0.14
Proportion of female in membership	1.55**	0.56
Constant	-107.66**	3.13
R^2 = 0.90 F value 523.028**		

** p<0.05 5% level of Significance.

The results obtained from testing the hypothesis put forward to explain the SCP relationship were presented in table 6. The model had been used to analyse the data related to the four selected FPO's in Krishna district over the period 2015-2017.

It can be observed from table 3 that the coefficients of efficiency and market share variables were statistically significant at 5% level of significance. As expected, the coefficient of L risk variable has negative sign and

statistically different from zero at 5 percent level of significance. The results also indicated that the coefficients of equity to asset ratio (EAR), age of FPO and proportion of female in membership are positive and statistically significant at 5% level.

The results also indicate that among alternative hypothesis, the relative efficient structure (Shepherd 1986) [8] hypothesis was one that holds for the four selected FPOs in Krishna district during the sample period. The estimated results showed that the whole coefficients of $\beta_2 > 0$ and $\beta_3 > 0$ are positive and statistically significant and different from zero while, the coefficient $\beta 1 = 0$. The concentration was found to be highly correlated, hence removed from the model and the structure measure was not considered to be important in SCP hypothesis (Suneetha and Milind 2004) [9].

This implies that the main factors that determine FPO's profitability are efficiency and market share providing a strong support for the relevancy of the efficient structure hypothesis (Tuncay and Mihittin 2016) [10].

The proportion of Market share was associated with the profitability which increase the returns by 42.7. The EAR value gives the FPOs total assets which were financed by the owner's capital rather than through debt indicating the financial stability. The financial position of FPOs was increased by 145.90 and showed that the capital supplied by the owner was more compared to creditors. Long term debt equity risk represented the long term portion borrowed and measures the indebtedness. L risk was negatively related and showed that the FPOs have more current liabilities (Seanica *et al.* 2006) [6]. As age of FPO increases, the performance of FPOs increase by 15 units. Higher proportion of female through varied skills in membership increases the heterogeneity which increases the performance of FPO by providing ideas and diversification of risks (Ragasa and Jennifer, 2012) [5]. Efficiency was the most important variable that determines the profitability of FPOs and increases by 12% (Tuncay and Muhittin, 2016) [10]. The coefficient of multiple determination (R^2) was found to be 0.90 indicating that 90 percent variation in the dependant variable was explained by the explanatory variables. The F-statistic found to be significant indicating that the model was fitted well.

Summary and Conclusion

The performance of FPOs increases with increase in the efficiency of FPO by 12 percent, market share was a measure of profitability which showed that the profitability of FPOs increase by 42%, EAR was 145.90 which shows that the FPOs are having strong equity base and are financially stable. Where age of FPO was more, the experience and external linkages would increase and this increases the performance by 15%. The heterogeneity in membership increased the performance of FPO by 1.5%.

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