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PERCEPTION AND EXPERIENCE OF THE FARMERS IN COMMODITY FUTURES TRADING- A STUDY

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Abstract

Over the past years, the farmers have experienced the risk related to their income because of the volatility of the prices of the agricultural commodities. In spite of several efforts by the Government, there is no improvement in their condition. Due to lack of knowledge about the advantages of price discovery and price risk management, they are unable to adopt the alternative strategies like hedging in futures markets. Against this backdrop, this paper intends to spot the factors influencing the farmers' participation and overall experience in futures trading. Based on survey data, four factors were extracted and they could explain 74.09 per cent of the variation. The effect of the four extracted factors on overall experience of the farmers in futures trading, was tested through multiple regression analysis. With respect to each extracted factor, the influence of the individual variable on overall experience of the farmers, was also measured through multiple regression analysis. The study found that nine out of seventeen variables indicated significant positive impact while four variables did not record any significant positive impact on farmers overall experience in futures trading. The study concluded that the outcome of the study would be helpful to the farmers, to take decisions regarding timing of selling their farm produces, physical delivery, etc., and to safeguard themselves from the price related risk.

Keywords: *Agricultural Commodities, Price Risk Management, Futures Market, Farmers' Perception, Level of Awareness, Overall Experience in Futures Trading.*

JEL Code : *C21, C38, G13, G18, O13, Q13.*

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1. Introduction

Farm producers often face the price and production related risks (**Parcell and Price, 2000**). Price risk arises due to market forces of supply and demand and production risks come from weather conditions, genetics, natural diseases, insect damages, etc (**Riley and Anderson, 2009**). The farmers can manage the price related risk through futures and options contracts. Primarily, futures market performs two basic functions, viz., price discovery and price risk management (**Eswaran and Ramasundaram, 2008**). Futures market functions like price discovery, hedging, etc. are useful to promote efficient production, agro processing and storage, financing and overall marketing of agricultural products (**Shim, 2006**).

In the last two decades, the domestic and global prices of food products have shown high volatility and the prices of farm produces are almost doubled (**Santeramo et al. 2018**). Hence, the price uncertainty and volatility of the market have emerged as key subjects for discussion at the global level, as it has exercised impact on farmers' income. (**Moschini and Hennessy, 2001**). During the period of COVID 19 (**Hohler and Lansik, 2021**), the increased price volatility had created a high degree of uncertainty in domestic as well as global spot markets, making income risk a frequent threat to the farmers (**Baffes and Haniotis, 2016**). As the risk and return should go hand in hand, the increasing price uncertainty creates huge demand for risk mitigation tools among farmers (**Coletta., *et. al.,* 2018**).

Hedging, through futures contracts, helps the farmers to mitigate the risk of unfavorable price changes, by looking for delivery price well in advance (**Hull, 2008**). Hence the usage of commodity futures contracts by farmers, to scale down the volatility of prices (**Zuppiroli and Revoredo-Giha, 2016**) and stabilize the income by reducing the price risk. In spite of several special programs conducted to help farmers, their status has not improved due to lack of awareness about the advantages of price discovery and price risk management. Hence this study was conducted to identify the motives of the farmers' participation and to find out their overall experience in futures trading.

2. Review of Literature

An optimistic and well-organized commodity derivatives market is a dire need and will be beneficial to the economy in general and primary stakeholders like farmers in particular (**Narayanan and Harikumar, 2019**). A study by researchers in Turkey maintained that 90 per cent of them have little knowledge, but have the inclination to use futures market and the remaining 10 per cent were discouraged by the market uncertainties (**Adanacioglu, H. 2008**). Another study, by **Babshetti and Basanna (2020),** stated that the level of awareness among the farmers in Karnataka is negligible and their involvement in commodity derivatives market is poor due to lack of required education, high speculation and poor liquidity. Similarly, a study by **Philip and Shanthamani (2016),** maintained that the literacy level of the farmers is the major hurdle for creating awareness about futures trading. Even among the farmers with awareness, the level of understanding about price discovery and hedging is low. Further, **Yadav, N., *et al.,* (2017)** documented that due to lack of financial literacy and awareness, the farmers' participation in commodity futures market is low and there is an urgent need to conduct

awareness programs and enlighten them by demonstrating the benefits and operational process of commodity derivatives market. In a study, by **Vikas, P.V., *et al.,* (2018),** it was established that the investors in Mumbai City are actively participating in capital market, but they are unaware of the commodity futures market. The researchers concluded that educating different categories of market participants like farmers, traders, etc, is the need of the hour. **Venkataraghavan and Sivasakkaravarthi (2022)** have analyzed the perception of farmers about the functioning of the commodity futures market, farmers' source of information regarding derivatives trading, their participation in trading and their problems, which keep them away from regular trading. **Basha, (2022)** has measured the influence of socio-economic characteristics of conveniently selected 150 farm producers' style of decision making and confirmed that the distance from town and non-farm income are the significant factors, which influenced the participation of farmers in commodity futures market. Based on the data from US Agricultural Resource Management Survey of 2016, **Daniel Prager., *et al.,* (2020)** have demonstrated that just over 10 per cent of corn and soybean farmers traded in futures contracts, covering over 40 per cent of their farm production and around 20-25 per cent of farmers have used marketing contracts, covering 40 per cent of production. Only 6-8 per cent of farmers have hedged all their production through the futures contracts.

3. Statement of the Problem

The farmers often experience the price related risk, which arises due to market uncertainties. In spite of numerous government initiatives, viz., crop insurance, minimum support price, etc., there is no significant change in the scenario. Further, the Government has focused on the acceleration of market driven mechanisms by introducing commodity futures trading in India. But, due to unawareness, the farmers are unable to follow innovative strategies like hedging in options or futures contracts. Against this background, the present study proposes to highlight the factors, influencing the farmers' participation and experience in commodity futures trading.

4. Need of the Study

Many earlier studies, while outlining various aspects, did not address the level of awareness among the farmers about commodity futures market, identify the significant variables promoting the farmers' participation in regular trading and measure their overall experience in futures trading. Hence there is a need to identify the variables, which motivate the farmers' participation and measure their overall experience in futures trading.

5. Objectives of the Study

1. To recognize the important variables (X_i), which enhance the farmers' participation in commodity futures market and group them into factors.
2. To measure the significance of the variables in each factor (X_i) which is the determinant of farmers' overall experience in futures trading (Y).

6. Hypotheses of the Study

1. $H_{01}: \beta_1 = \beta_2 = \text{-----} = \beta_k = 0$, there is no significant linear relationship between X_i (extracted factors, $i = 1$ *to* k) and Y.
2. $H_{02}: \beta_1 = \beta_2 = \text{-----} = \beta_k = 0$, there is no significant linear association between X_i (individual variables, $i = 1$ *to* k) and Y.

7. Research Methodology

In view of the aforesaid objectives, the current study employed an empirical research approach to evaluate the perceptions of the farmers, who had participated in commodity futures trading. The study also employed the causal research method, to quantify the impact of different variables of each factor, on farmers' overall experience in futures trading.

7.1. Sample Selection

The study population consisted of farmers having the awareness about commodity futures market in the four districts of Rayalaseema Region of A.P. Using **Krejcie and Morgan (1970)** model, the sample size for the study was determined at 95% confidence and at 5% significance level (margin of error) and the sample size was fixed at 392. Multistage-cum-judgment sampling method was adopted for selecting the sample respondents for the study. In stage-1, 14 revenue divisions from 4 districts of Rayalaseema Region of A.P., were identified. In stage-2, at the rate of 2 revenue mandals from each revenue division, 28 revenue mandals were selected (14x2=28). In stage-3, two revenue villages from each of the 28 revenue mandals (28x2=56), i.e., 56 revenue villages were selected. In stage-4, from each of the selected revenue villages, seven farmers having the awareness about the commodity futures trading, were selected, using judgement sampling. Thus, the total sample of 392 (14x2=28x2=56x7=392) farmers, from four districts of Rayalaseema Region, were selected for the study.

7.2. Sources of Data

The requisite primary data, for the study were collected by administering a structured questionnaire to the sample farmers. Initially, a questionnaire was drafted and tested by conducting a pilot study. Based on the experience in the conduct of pilot study, the necessary changes were made to the questionnaire and the same was administered to the respondent farmers.

7.3. Period of the Study

For the current study, the data collection work was conducted during the most turbulent pandemic period from January, 2022 to April, 2022.

7.4. Tools used in the Study

The internal consistency of the data was verified, using reliability analysis by calculating Cronbach's Alpha (**Coakes, J. C. and Ong, C., 2011**). Using the factor analysis, the large number of items from the questionnaire were reduced to certain constructs (**Chua, Y.P., 2009**) and the appropriateness of the data for factor analysis was tested by using KMO test, as suggested by **Norusis, M. J. (1994)**. Using the method of least squares, the best fit linear multiple regression equations were developed, by calculating the values of intercept (α) and the regression coefficients (β_1, β_2, ... β_k). To test whether the independent variables enjoyed linear relationship with the dependent variable (**Kothari, C. R., 2004**), F-Statistic was used. For testing the hypothesis and to find out whether individual cause variables reported significant linear relationship with the affecting variable, t-statistic was used. Multicollinearity was tested

through *Variance Inflation Factor* (*VIF*), which is the reciprocal of *tolerance*.

8. Data Analysis of Perception and Experience of the Farmers in Commodity Futures Trading in Rayalaseema Region

Table-1 portrays the profile of the respondent farmers, according to gender, age, educational qualifications, marital status, religion, occupation, land holding (in acres), land ownership and crops cultivated. As shown in **Table-2**, the reliability statistic for 18 variables of farmers' perception, was 0.920 and hence items' were suitable for the analysis. The value of KMO, for those 18 items was 0.811, which ranged between 0.8 to 0.9, indicating that the items were highly suitable for the factor analysis (**Kaiser, 1974**). Further, the value of Bartlett's test of sphericity (**Bartlett, 1950**) was less than 0.5, impliying the appropriateness of data for the factor analysis. **Table-3** depicts the factors, extracted by the principal components factor analysis technique, followed by varimax rotation. 85% of variance could be explained by *Var_16*, 84% of the variance could be explained by *Var_03*, 81% of the variance could be explained by *Var_05* and *Var_07*, and 79% of the variance could be explained by *Var_17*. **Table-4** portrays the factors extracted in four stages, using principal component analysis, which influenced the overall satisfaction of the farmers trading in commodity futures market. Only four factors were extracted because their Eigen values were greater than one (**Raymond B. Cattell, 1966**) and they had explained 74.099 per cent of the variance. Further, the Eigen values are plotted in screen plot (**Fig-1**). **Table-5** demonstrates the rotated component matrix for the data. After conducting Varimax Rotation with Kaiser Normalization, Factor-1 included four variables, Factor-2 included five variables, Factor-3 included five variables, but Factor-4 included only two variables. The extracted factors are relabeled, as shown in **Table-6,** which reveals the loadings of different items, extracted into four factors, subsequent to varimax rotation.

Table-7 presents the summary of the regression model, which portrays that the R^2 value was 0.356, which indicated that 35.6% of the variance in response variable could be explained by the predictor variables, viz., X_1, X_2, X_3 and X_4. The '*F*' statistic value was 53.524, with $p < 0.001$, implying that the regression model was significant statistically. **Table-8** presents the values of beta coefficients of the extracted factors. The t-statistic explains the significance of each one of the predictor variables. **Table-9** shows the range of standardized and un-standardized regression coefficients of the variables extracted under factor-1 (X_1). It is observed that the VIF level for *Var_07* was 3.351 but, its t-statistic was not significant and the beta coefficient was also negative and hence removed from the model. The results of the model, after removing *Var_07,* are given in **Table-10**. **Table-11** displays the results of regression coefficients, t-statistic and collinearity statistics for the variables of the extracted Factor-2 (X_2). It is noticed that the VIF level for *Var_01* was 3.735 and *Var_05* was 3.362, but their t-statistic was not significant and hence removed from the model. The results of the model, after removing *Var_01* and *Var_05,* are given in **Table-12**. **Table-13** presents the results of regression coefficients, t-statistic and collinearity statistics for the variables of the extracted Factor-3 (X_3) and establishes that multicollinearity did not exist. **Table-14** exhibits the results of regression

coefficients, t-statistic and collinearity statistics for the variables of the extracted Factor-4 (X_4) and demonstrates that multicollinearity did not exist.

9. Findings of the Study

- § It was found from the study that the principal component factor analysis extracted only four factors because their Eigen values were greater than one and they explained 74.09 per cent of the variance.
- § Among the extracted factors, factor "X_4" exercised significant influence on the farmers' over all experience to the extent of 0.313, followed by the factor "X_2" to the extent of 0.30, "X_1" to the extent of 0.177, and "X_3" to the extent of -0.077.
- § With regard to extracted factor-1 (X_1), *Var_10, Var_15* reported significant influence and *Var_06* recorded insignificant influence on the farmers' over all experience in commodity futures trading.
- § With respect to extracted factor-2 (X_2), *Var_03 and Var_04* did not exert significant influence and *Var_02* reported insignificant influence on the farmers' over all experience in commodity futures trading.
- § Regarding the extracted factor-3 (X_3), *Var_09, Var_11 and Var_14* exercised significant influence and *Var_08 and Var_12* exerted insignificant influence on the farmers' over all experience in commodity futures trading.
- § Finally, with regard to extracted factor-4 (X_4), *Var_16 and Var_17* reported statistically significant influence on farmers' overall experience in futures trading.

10. Suggestions

In the light of above findings, it would be appropriate to offer few suggestions. (i) Farmers should be enlightened by educating them and debunking the myths about trading through commodity futures. (ii) Government should institutionalize the farmers' training and awareness through a mechanism, by integrating the commodity futures markets, financial institutions, agricultural marketing cooperatives and farmers' training centers. (iii) Training-cum-awareness programs should be conducted at regular intervals by explaining the advantages of hedging through commodity futures contracts.

11. Conclusion

In view of the results of the study, it can be concluded that multiple variables reported significant influence (tested at 95 per cent confidence limit) on overall satisfaction of the farmers' experience in commodity futures trading, viz., risk management through hedging, price discovery, better price for farm produces and protection from the risk of price fluctuations in physical market. It is also concluded that few of the variables, viz., increasing speculation, estimation of future spot prices of commodities, domination of speculators, price-risk management, etc., revealed insignificant impact on overall satisfaction of the farmers.

12. Limitations of the Study

The field work for the present study was conducted during the first quarter of 2022, which included the most turbulent COVID-19 pandemic period. During the pandemic period, the farmers had experienced several problems due to abnormal market-cum-price volatility, and that

may have affected the perception of farmers and in turn, the results of the current study. Moreover, the study covered only farmers of four districts of Rayalaseema Region of Andhra Pradesh.

13. Scope for Further Study

There is enormous scope to extend the study by covering more regions of the State. The study may also be extended to examine the utilization of market information by the farmers, impact of socio-economic factors of the farmers on their market participation, investment pattern of farmers in commodity futures market, impact of futures market on farmers' welfare, hedging effectiveness of commodity futures market to reduce risk, farmers' strategies to manage uncertainties, farmers' risk preference and preparedness to participate in futures market, etc.

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Table-1: Demographic Profile of the Respondents in Farmers in Commodity Futures Trading in Rayalaseema Region of Andhra Pradesh

Demographic Factor		Frequency	Percentage
Gender	Male	363	92.6
	Female	29	7.4
Age (Years)	Below 20	22	5.6
	20-30	80	20.4
	30-40	79	20.2
	40-50	78	19.9
	50-60	82	20.9
	Above 60	51	13.0
Educational Qualifications	SSC	236	60.2
	Intermediate	106	27.0
	U.G	5	1.3
	Professional	45	11.5
Marital Status	Married	351	89.5
	Un Married	41	10.5
Religion	Hindu	217	55.4
	Muslim	108	27.6
	Christian	63	16.1
	Others	4	1.0
Land Holding (in Acres)	Below 1	56	14.3
	1	43	11.0
	2	62	15.8
	3	54	13.8
	4	60	15.3
	5	56	14.3
	Above 5	61	15.6
Land Ownership	Owned Land	190	48.5
	Leased Land	202	51.5
Crops Cultivated	Paddy	35	8.9
	Sugar Cane	34	8.7
	Chili	51	13.0
	Cotton	45	11.5
	Tobacco	50	12.8
	Cereals	41	10.5
	Fruits	47	12.0
	Vegetables	43	11.0
	Others	46	11.7

Source: Primary Data computed using SPSS.

Table-2: Testing of Reliability for Variables of Farmers' Perception in Rayalaseema Region of Andhra Pradesh

Cronbach's Alpha	KMO Measure of Sampling Adequacy.		0.811
0.920	Bartlett's Test of Sphericity	Approx. Chi-Square	5321.527
Number of Items		Degrees of freedom	136
18		Sig.	0.000

Source: Primary Data computed using SPSS.

Table-3: Communalities of the Study Variables Regarding Perception and Experience of the Farmers in Commodity Futures Trading

Code	Variable	Initial	Extraction
Var_01	Futures trading give the early indications to the farmers about the expected price movements.	1.000	0.763
Var_02	Futures contract prices are impartial estimates of the future spot prices of the commodities.	1.000	0.803
Var_03	Futures trading increases the demand for farm produces.	1.000	0.843
Var_04	Futures trading in agricultural commodities leads to increase spot prices of them.	1.000	0.676
Var_05	Futures trading in agricultural commodities leads to fluctuations (volatility) in spot prices of them.	1.000	0.814
Var_06	The price instability (volatility) is due to increasing speculative activities in future market.	1.000	0.779
Var_07	The price instability (volatility) is due to increasing speculative activities in physical market.	1.000	0.812
Var_08	Transactions in futures market is dominated by speculators.	1.000	0.642
Var_09	Transactions in futures market are highly controlled by speculators.	1.000	0.644
Var_10	Futures market participants should be the hedgers.	1.000	0.759
Var_11	Price discovery function will happen in the futures market.	1.000	0.784
Var_12	Price-risk management function will happen in futures trading.	1.000	0.738
Var_13	Futures trading leads to integration of markets separated across geographically.	1.000	0.561
Var_14	Because of futures trading in agricultural commodities, the domestic prices are moving on par with the prices internationally.	1.000	0.735
Var_15	Futures trading helpful for "risk management" and "profit making".	1.000	0.598
Var_16	Futures trading has brought better price for my farm produces.	1.000	0.851
Var_17	Futures trading saved me from the risk of price fluctuations in physical market.	1.000	0.791

Source: Primary Data computed using SPSS.

Table-4: Factors Extracted through PCA (Principal Component Analysis)

Comp-onent	*Initial Eigen values*			*Extraction Sums of Squared Loadings*			*Rotation Sums of Squared Loadings*		
	Total	*% of Variance*	*Cumu-lative %*	*Total*	*% of Variance*	*Cumu-lative %*	*Total*	*% of Variance*	*Cumu-lative %*
1	7.753	45.608	45.608	7.753	45.608	45.608	3.968	23.344	23.344
2	2.067	12.162	57.770	2.067	12.162	57.770	3.766	22.156	45.500
3	1.552	9.129	66.899	1.552	9.129	66.899	2.952	17.362	62.862
4	1.224	7.200	74.099	1.224	7.200	74.099	1.910	11.237	74.099
5	0.775	4.559	78.658						

Source: Primary Data computed using SPSS

Table-5: Rotated Component Matrix[a] Regarding the Variables of Perception and Experience of the Farmers in Commodity Futures Trading

Variables	Component			
	Factor-1	Factor-2	Factor-3	Factor-4
Var_01		0.745		
Var_02		0.774		
Var_03		0.893		
Var_04		0.656		
Var_05		0.680		
Var_06	0.784			
Var_07	0.820			
Var_08			0.555	
Var_09			0.540	
Var_10	0.773			
Var_11			0.864	
Var_12			0.680	
Var_13				
Var_14			0.798	
Var_15	0.724			
Var_16				0.874
Var_17				0.859
% of Variance	45.608	12.162	9.129	7.200
Cumulative % of Variance	45.608	57.770	66.899	74.099

Source: Primary Data computed using SPSS

Table-6: Labels of Newly Extracted Factors along with Proportion of Variance Explained

Name of the New Factor	*Loaded Items*	*Factor Loadings*				*% of Variance*
		1	*2*	*3*	*4*	
Due to increased Speculation in physical market, the farmers can hedge their risk and increase their profit in futures market (X_1).	*Var_06*	0.784				45.608
	Var_07	0.820				
	Var_10	0.773				
	Var_15	0.724				
Futures market signals the price movements, estimates the prices impartially and increases the demand for farm products (X_2).	*Var_01*		0.745			12.162
	Var_02		0.774			
	Var_03		0.893			
	Var_04		0.656			
	Var_05		0.680			
Futures market performs the functions of price discovery, price-risk management and leads to parity between domestic and international prices (X_3).	*Var_08*			0.555		9.129
	Var_09			0.540		
	Var_11			0.864		
	Var_12			0.680		
	Var_14			0.798		
Futures trading offers better price for farm produces and saves from the risk of price fluctuations (X_4).	*Var_16*				0.874	7.200
	Var_17				0.859	

Source: Primary Data computed using SPSS

Table-7: Summary of the Regression Model and F-Statistic (Extracted Factors only)

Model	*R*	*R^2*	*Adj. R^2*	*S.E. of Estimate*	*F - Statistic*	*Sig.*
1	0.597	0.356	0.350	0.910	53.524	.000*
Notes: Predictors: *(Constant), X_1, X_2, X_3, X_4, *$p<0.05$*.*						

Source: Primary Data computed using SPSS

Table-8: The Regression Coefficients, t and Colinearity Statistics for Extracted Factors

Model		*Regression Coefficients*			*t-Statistic*	*Sig.*	*Collinearity Statistics*		*Results*
		Unstd. Beta	*S.E. of Estimate*	*Std. Beta*			*Tolerance*	*VIF*	
1	*(Constant)*	0.311	0.211		1.478	0.140			
	X_1	0.177	0.022	0.458	8.161	0.000*	0.527	1.896	Reject H_{01}
	X_2	0.030	0.018	0.095	1.680	0.094#	0.517	1.934	Accept H_{01}
	X_3	-0.077	0.018	-0.248	-4.339	0.000*	0.511	1.956	Reject H_{01}
	X_4	0.313	0.034	0.407	9.318	0.000*	0.873	1.146	Reject H_{01}

Dependent Variable: Var_18

*Significant at 5% level; #Not significant at 5% level.

Table-9: The Regression Coefficients, t and Collinearity Statistics for the Variables of the Extracted Factor-1 (X_1)

Model		Regression Coefficients			t-Statistic	Sig.	Collinearity Statistics		Results
		Unstd. Beta	S.E. of Estimate	Std. Beta			Tolerance	VIF	
1	(Constant)	0.823	0.168		4.896	0.000			
	Var_06	0.024	0.078	0.022	0.315	0.753#	0.360	2.781	Accept H_{02}
	Var_07	-0.034	0.087	-0.030	-0.389	0.697#	0.298	3.351	Accept H_{02}
	Var_10	0.323	0.073	0.291	4.425	0.000*	0.420	2.379	Reject H_{02}
	Var_15	0.362	0.056	0.335	6.497	0.000*	0.685	1.459	Reject H_{02}

Dependent Variable: Var_18
*Significant at 5% level; #Not significant at 5% level.
Source: Primary Data computed using SPSS

Table-10: The Regression Coefficients, t and Collinearity Statistics for the Variables of the Extracted Factor-1 (X_1)

Model		Regression Coefficients			t-Statistic	Sig.	Collinearity Statistics		Results
		Unstd. Beta	S.E. of Estimate	Std. Beta			Tolerance	VIF	
1	(Constant)	0.819	0.168		4.887	0.000			
	Var_06	0.007	0.0063	0.006	0.105	0.916#	0.553	1.810	Accept H_{02}
	Var_10	0.311	0.066	0.281	4.710	0.000*	0.513	1.950	Reject H_{02}
	Var_15	0.361	0.056	0.334	6.492	0.000*	0.687	1.455	Reject H_{02}

Dependent Variable: Var_18
*Significant at 5% level; #Not significant at 5% level.
Source: Primary Data computed using SPSS

Table-11: The Regression Coefficients, t and Collinearity Statistics for the Variables of the Extracted Factor-2 (X_2)

Model		Regression Coefficients			t-Statistic	Sig.	Collinearity Statistics		Results
		Unstd. Beta	S.E. of Estimate	Std. Beta			Tolerance	VIF	
1	(Constant)	1.614	0.190		8.488	0.000			
	Var_01	0.112	0.098	0.106	1.141	0.255#	0.268	3.735	Accept H_{02}
	Var_02	0.005	0.075	0.004	0.062	0.950#	0.489	2.044	Accept H_{02}
	Var_03	0.124	0.086	0.109	1.455	0.146#	0.413	2.422	Accept H_{02}
	Var_04	0.050	0.076	0.046	0.659	0.510#	0.470	2.219	Accept H_{02}
	Var_05	0.124	0.100	0.110	1.248	0.213#	0.297	3.362	Accept H_{02}

Dependent Variable: Var_18
*Significant at 5% level; #Not significant at 5% level.
Source: Primary Data computed using SPSS

Table-12: The Regression Coefficients, t and Collinearity Statistics for the Variables of the Extracted Factor-2 (X_2)

Model		Regression Coefficients			t-Statistic	Sig.	Collinearity Statistics		Results
		Unstd. Beta	S.E. of Estimate	Std. Beta			Tolerance	VIF	
1	(Constant)	1.686	0.189		8.925	0.000			
	Var_02	0.044	0.074	0.041	0.600	0.549#	0.510	1.961	Accept H_{02}
	Var_03	0.180	0.083	0.157	2.155	0.032*	0.440	2.270	Reject H_{02}
	Var_04	0.163	0.064	0.150	2.541	0.011*	0.674	1.483	Reject H_{02}

Dependent Variable: Var_18
*Significant at 5% level; #Not significant at 5% level.
Source: Primary Data computed using SPSS

Table-13: The Regression Coefficients, t and Collinearity Statistics for the Variables of the Extracted Factor-3 (X_3)

Model		Regression Coefficients			t-Statistic	Sig.	Collinearity Statistics		Results
		Unstd. Beta	S.E. of Estimate	Std. Beta			Tolerance	VIF	
1	(Constant)	1.755	0.200		8.760	.000			
	Var_08	0.102	0.067	0.099	1.529	0.127#	0.547	1.828	Accept H_{02}
	Var_09	0.206	0.072	0.185	2.843	0.005*	0.538	1.857	Reject H_{02}
	Var_11	-0.267	0.067	-0.276	-4.010	0.000*	0.481	2.081	Reject H_{02}
	Var_12	0.125	0.065	0.119	1.912	0.057#	0.589	1.696	Accept H_{02}
	Var_14	0.199	0.071	0.189	2.799	0.005*	0.497	2.012	Reject H_{02}

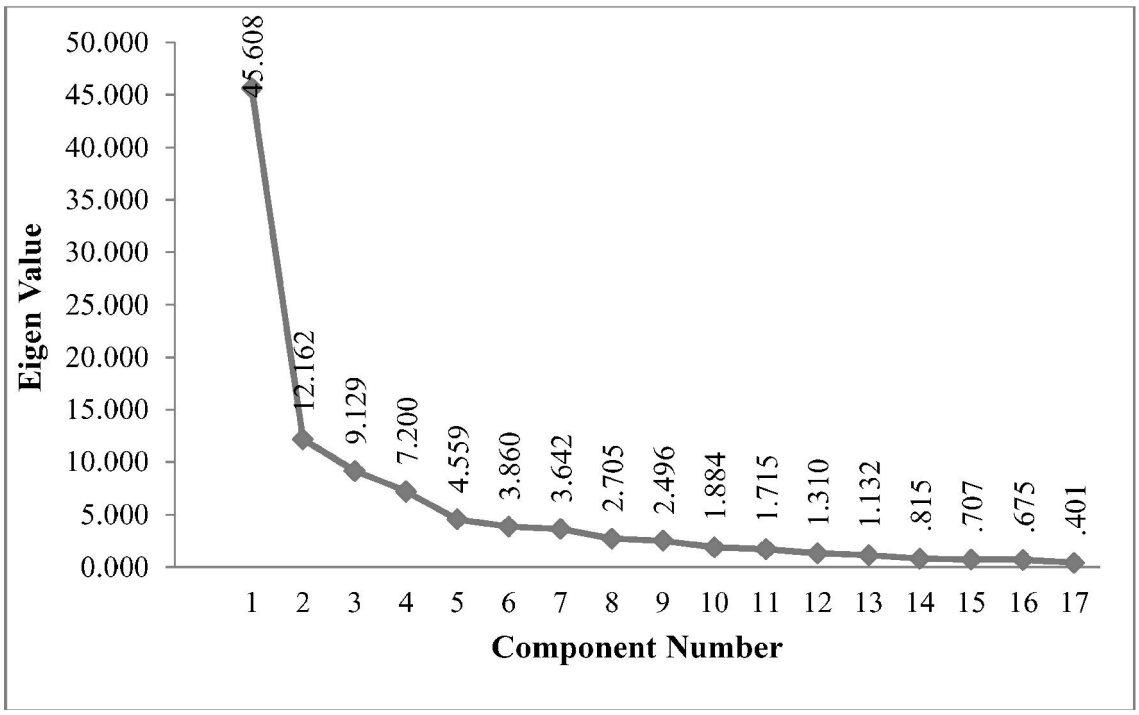
Dependent Variable: Var_18
*Significant at 5% level; #Not significant at 5% level.
Source: Primary Data computed using SPSS

Table-14: The Regression Coefficients, t and Collinearity Statistics for the Variables of the Extracted Factor-4 (X_4)

Model		Regression Coefficients			t-Statistic	Sig.	Collinearity Statistics		Results
		Unstd. Beta	S.E. of Estimate	Std. Beta			Tolerance	VIF	
1	(Constant)	1.162	0.179		6.490	0.000			
	Var_16	0.250	0.069	0.234	3.644	0.000*	0.506	1.976	Reject H_{02}
	Var_17	0.259	0.070	0.237	3.688	0.000*	0.506	1.976	Reject H_{02}

Dependent Variable: Var_18
*Significant at 5% level; #Not significant at 5% level.
Source: Primary Data computed using SPSS

Fig-1: Screen Plot of Eigen values



Source : Primary Data Computed using SPSS