Borrowing Behaviour and Resource Use Efficiency of Farmers in Guntur district of Andhra Pradesh*

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ABSTRACT
    The borrowing behaviour and resource use efficiency of sample farmers were generated from the data collected from 120 farmers (land owned farmers, semi- tenant farmers and tenant farmers) from six villages of three mandals in Guntur district of Andhra Pradesh. Discriminant function analysis revealed that institutional loan amount (52.67 %) was the major discriminator followed by operational costs (38.56%), net returns (3.16 %), wage income, (2.46 %), family expenditure (2.38 %) and non- institutional loan amount (0.77 %) for land owned farmers Vs. semi-tenant farmers, while the institutional loan amount (81.38 %) was the major discriminator followed by operational costs (22.48 %) and non-institutional loan amount (0.39 %) for land owned farmers Vs. tenant farmers. For semi-tenant farmers Vs. tenant farmers operational costs (54.71%) followed by institutional loan amount (49.08 %), non-institutional loan amount (3.18 %) and family expenditure (0.55%) were the major discriminotors. Land and labour cost showed significant influence on gross returns of land owners. The regression co-efficient of labour cost was positive and significant at 1 per cent level of significance for land owned farmers. Labour cost, borrowed capital and owned capital showed positive and significant influence on gross returns of semi- tenant farmers. Land, borrowed capital and owned capital showed positive and significant influence on gross returns of tenant farmers.

Key words : Borrowing behavious, Efficiency of farmer, Resource.

Indian agriculture is predominantly characterised by small and marginal farmers, tenants, landless / agricultural labourers with high degree of fragmentation and skewed distribution of land holdings. The development of agriculture depends on the adoption of new technologies and the adoption of new technology demands agricultural credit (Aroutselvam and Zeaudeen, 2000), which is the major input in agriculture. The role of credit is very critical in enabling the poor to overcome poverty (Burgess and Pande, 2003). More than 80 per cent of credit was used for productive purposes and the rest for unproductive purposes (Hatai *et al.,* 2005). With the increase in the absentee landlords, urban non-cultivating class investments in agricultural land and migration of owner farmers to urban areas, the number of tenant farmers are growing year by year. The government virtually had no record of information on tenant holdings, number of tenant farmers, etc., by which they are denied of several benefits from developmental programmes.

With the onset of Green Revolution, the technological development in agriculture increased the capital needs, differentially, though across farm size classes. In the race between the supply of formal credit and the demand for capital on farms, the former lagged behind, leaving a big gap to be filled by high cost alternatives such as private moneylenders, dealers, microfinance institutions (MFIs), etc. where small and marginal farmers are usually left out of the purview of formal credit (Satyasai, 2010). In contrast, they need more external liquidity support due to limited resource to own savings and other inherent vulnerabilities that limit their creditworthiness. In this context, this paper has analysed the socio-economic factors affecting the borrowing behaviour and resource use efficiency of different categories of farmers in Guntur district of Andhra Pradesh.

MATERIAL AND METHODS
    The present study was carried out in Guntur district of Andhra Pradesh during 2013-14. The data was generated with personal surveys of farmers selected from six villages of three mandals in the district. From each selected village, 20 farmers, including land owned farmers, semi-tenant farmers

Table 1. Mean of the selected variables for sample farmers.

Variables	Land owned farmers (n= 50)	Semi-tenant farmers (n= 40)	Tenant farmers(n= 30)
Land holding(X_1) (ha)	1.375	1.293	1.13
Family size (X_2) (No.)	3.72	3.675	3.63
Education (X_3) (No.)	1.9	1.825	1.83
Family expenditure(X_4) (Rs.)	61700	52525	50900
Institutional loan amount (X_5) (Rs.)	110400	68675	–
Non- institutional loan amount (X_6) (Rs.)	34700	43750	62833
Wage income (X_7) (Rs.)	14025	16863	15232
Net returns(X_8) (Rs.)	88907	79180	67334

Source: Field survey data

Table 2. Discriminant function analysis of land owned farmers Vs. semi-tenant farmers.

S. No.	Variable	Mean difference (di)	Discriminant coefficient (Li)	Li*di	Percentage contribution to the total distance
1	Land holding	0.076	-1.669	-0.127	0.00
2	Family size	0.045	0.095	0.004	0.00
3	Education	0.075	0.042	0.003	0.00
4	Family expenditure	9175	0.194	1779.95	2.38
5	Institutional loan amount	41725	0.945	39430.12	52.67
6	Non- institutional loan amount	-9050	-0.064	579.2	0.77
7	Wage income	-2837.4	-0.648	1838.63	2.46
8	Net returns	9727.06	0.243	2363.67	3.16
9	Operational costs	26781.96	1.078	28870.96	38.56
	Total		D^2	74862.42**	100

**Significant at 1% level

and tenant farmers were selected based on probability proportional to the size, thus forming a final sample of 120 farmers for the study.

Discriminant function Analysis

To identify the socio- economic factors responsible for discrimination between two groups of farmers, Discriminant function analysis was carried out by taking land owned farmers Vs. semi-tenant farmers, land owned farmers Vs. tenant farmers and semi-tenant farmers Vs. tenant farmers, by considering the variables as described below..

$$Z = L_1X_1 + L_2X_2 + L_3X_3 + L_4X_4 + L_5X_5 + L_6X_6 + L_7X_7 + L_8X_8$$

Where

Z = Total discriminant score for the two groups
X_1 = Land holding size (ha)
X_2 = Education level (1-illiterate, 2- can read, 3- can read and write)
X_3 = Family size (No.)
X_4 = Household expenditure per annum (Rs.)
X_5 =Wage income (Rs.)
X_6 = Institutional loan amount (Rs.)
X_7 = Non- institutional loan amount (Rs.)
X_8 = Net returns (Rs.)

Resource use efficiency of the farmers

Multiple linear regression of the following form was employed for analyzing the resource use efficiency of land owned farmers, semi-tenant farmers and tenant farmers.

Table 3. Discriminant function analysis of land owned farmers Vs. tenant farmers

S. No.	Variable	Mean difference (di)	Discriminant coefficient (Li)	Li*di	Percentage contribution to the total distance
1	Land holding	0.241	-1.62	0.391	0.00
2	Family size	0.086	0.121	0.010	0.00
3	Education	0.066	0.073	0.004	0.00
4	Family expenditure	10800	-0.014	-151.2	-0.06
5	Institutional loan amount	110400	1.686	186134.4	81.38
6	Non- institutional loan amount	-28133.33	-0.032	900.26	0.39
7	Wage income	-1206.73	0.131	158.08	-0.07
8	Net returns	21572.70	-0.437	9427.27	-4.12
9	Operational costs	71607.54	0.718	51414.21	22.48
	Total		D^2	228711.95**	100

**Significant at 1% level

Table 4. Discriminant function analysis of semi- tenant Vs. tenant farmers.

S. No.	Variable	Mean difference (di)	Discriminant coefficient (Li)	Li*di	Percentage contribution to the total distance
1	Land holding	0.160	-0.477	0.076	0.00
2	Family size	0.041	-0.072	-0.003	0.00
3	Education	-0.008	-0.091	-0.0007	0.00
4	Family expenditure	1625	0.411	667.87	0.55
5	Institutional loan amount	68675	0.862	59197.85	49.08
6	Non- institutional loan amount	-19083.33	-0.201	3835.75	3.18
7	Wage income	1630.67	-0.373	608.23	-0.50
8	Net returns	11845.64	-0.716	-8481.48	-7.03
9	Operational costs	44825.57	1.472	65983.24	54.71
	Total		D^2	120594.91**	100

**Significant at 1% level

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e$$

Where

     Y = Gross returns (Rs.)
     X_1 = Land holding (ha)
     X_2 = Total labour cost (Rs.)
     X_3 = Borrowed capital (Rs.)
     X_4 = Owned capital (Rs.)
     a = Intercept
     b_1, b_2, b_3, b_4 are the regression coefficients
     e = Error term

RESULTS AND DISCUSSION
Borrowing Behaviour

The discriminant function explains the relative importance of different variables, of their power to discriminate the two groups of sample farmers. The D^2 value was found significant at 1% level for all the three compared groups. The means of the selected variables of the sample farmers are indicated in Table 1.

The relative importance of the discriminators was calculated through their

Table 5. Factors influencing the resource use efficiency of sample farmers.

Variables	Land owned farmers		Semi-tenant farmers		Tenant farmers	
	Coefficient	t- value	Coefficient	t- value	Coefficient	t- value
Intercept	18295.6	2.26	-7442.80	-0.29	1625.85	0.16
Land(X_1)	4215.58	2.57*	3663.51	0.13	-3883.7	3.06**
	(1636.04)	8.62**	(2663.45)	4.22 **	(1269.04)	0.81
Labour cost(X_2)	2.44	0.93	1.27	3.60**	0.32	5.61**
	(0.28)	1.05	(0.30)	4.45**	(0.40)	5.64**
Borrowed capital (X_3)	0.18		0.45		1.48	
	(0.19)		(0.12)		(0.26)	
Owned capital(X_4)	0.17		0.87		1.33	
	(0.16)		(0.19)		(0.23)	
R^2	0.97		0.91		0.97	

Source: Field survey data
Figures in parentheses indicate Standard errors
*significant at 5% level of significance
** Significant at 1% level of significance

percentage contribution to the total distance. It is revealed from table 2 that the institutional loan amount was the major discriminator (52.67 %) followed by operational costs (38.56 %). The other variables like net returns, wage income, family expenditure and non-institutional loan amount contributed to 3.16 %, 2.46 %, 2.38% and 0.77 % respectively to the total distance.

From table 3, the analysis revealed that the institutional loan amount was the major discriminator (81.38 %) followed by operational costs (22.48 %). The other variable, non-institutional loan amount (0.39 %) contributed marginally to the total distance.

The discriminant analysis between semi-tenant and tenant farmers (Table 4) revealed that the major discriminator was the operational costs (54.71 %) followed by institutional loan amount (49.08 %), non-institutional loan amount (3.18 %) and family expenditure (0.55%).

Resource use efficiency

The co-efficient of multiple determination (R^2) values were 0.97, 0.91, 0.97 for land owned farmers, semi-tenant farmers and tenant farmers as evidenced from Table 5. The R^2 values indicated the proportion of the total variation of output that is accounted by the four included independent variables. The high percentage values show the equations to give good representation of the relationship between farm output and the included variables.

Regression analysis using the independent variables namely land (X1), labour cost (X2), borrowed capital (X3) and owned capital (X4) revealed that land and labour cost showing significant influence on gross returns of land owned farmers. The regression co-efficient of labour cost was positive and significant at 1 per cent level of significance as the land owners mainly depend on hired labour for their farming operations. The result is in agreement with Kale (2005) indicating that labour cost had significant influence on the value of output.

For semi-tenant farmers, labour cost, borrowed capital and owned capital showed positive and significant influence on gross returns with the regression coefficients of 4.22, 3.60 and 4.45 respectively. While the variables land, borrowed capital and owned capital showed positive and significant influence on the gross returns of tenant farmers. The result is in agreement with Ebong (2011) where it was reported that farm size, labour and capital become significant variables to tenants in their use of farm resources.

CONCLUSIONS

Net returns, wage income and family expenditure are contributing marginally to the total distance, while the loan amount and operational costs were found to be the major discriminating factors in selected groups of farmers, indicating the importance of capital investment in agriculture.

Land exhibited significant influence for land owned farmers and tenant farmers inferring that increase in area under cultivation, irrespective of whether owned or leased land will increase the yield and gross returns of the two categories of farmers.

Labour cost showed positive influence for all the three groups, but significant in owned land farmers and semi-tenant farmers, indicating further increase in labour cost will result in increased gross returns.

Borrowed capital and owned capital showed positive and significant influence on gross returns of semi-tenant farmers and tenant farmers who are usually resource poor indicating the need of external finance.

LITERATURE CITED

Aroutselvam C and Zeaudeen P 2000 Agricultural credit - A study in Vilianur block, Pondicherry region. *Financing Agriculture,* 32 (3): 17- 18.

Burgess R and Pande R 2003 Do rural banks matter? Evidence from the Indian Social Banking Experiment, Discussion Paper DEDPS/40, The Suntory Centre, *London School of Economics and Political Science,* London, U.K.

Ebong V O, Effiong E O, Eshiet A J and Nuka H 2011 Resource use efficiency of land owners and tenants in cassava based farms in Akwa Ibom State, Nigeria: A Comparative analysis. *Agriculture and Biology Journal of North America,* http://www.scihub.org/ABJNA

Hatai L D, Singh H P, Sen C and Dixit R S 2005 An economic analysis of Agricultural credit and overdues in different regions of Uttar Pradesh. *Indian Journal of Agricultural Economics*, 60 (3): 364.

Satyasai K J S 2010 Equity in Indian agricultural credit delivery. Paper presented in *12th Annual Conference on Money and Finance in the Indian Economy,* held at Indira Gandhi Institute of Development Research, Mumbai. http://www.igidr.ac.in/~money/mfc-12/ index12.html (accessed on 28 February 2011).

Kale N K, Navadkar D S, Gavali A V and Sale D L 2005 Resource use structure and efficiency in chilli cultivation in Thane district of Konkan region. *Indian Journal of Agricultural Economics*, 60 (3): 529.