An Econometric Study of Determinants of Credit under Kisan Credit Card

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Abstract

The objective of the paper is to analyse the impact and determinants of credit under Kisan(Farmer) Credit Card(KCC) scheme in India. The KCC came into existence in 1998-99 as a credit product that allowed farmers the required financial liquidity and avail credit when it was absolutely needed, providing flexibility, timeliness, cost effectiveness and hassle free services to the farmers. Out of the 300 farmers interviewed, 76 per cent of total sample farmers felt that the KCC was very much farmer friendly. The KCC holders got benefits like, (i) meeting credit requirements for crop cultivation for the whole year, (ii) availability of credit whenever the credit is needed, (iii) flexibility in drawing cash/buying inputs from any supplier of choice, (iv) reduction in quantum of interest due to withdrawal flexibility, (v) reduction in cost of credit for availing the bank loan etc. Cost of Cultivation (0.4428) as a whole influence significantly to the credit requirement under KCC compared to other variables, i.e. Consumption Loan (0.1236) and Loan for Non-farm sector (0.2241). the issue of credit cards by banks increased up to 2001-02, significantly decreased in 2002-03 and increased steadily thereafter till 2010.

Key Words: Agriculture, Credit , Determinant, Farmer, Institution

Introduction

Provision of timely, hassle free   and adequate credit has been one of the major challenges for banks in India in dispensation of agricultural and rural credit to the farmers. Constant innovation is necessary in order to achieve the aim of providing credit for rural development (Nandan, 2005). Agricultural credit cards are not a new concept in the field of agricultural banking in India. The scheme had already been introduced in a number of public sector banks in a some states in India prior to 1998. These schemes were niche-marketed and were exclusively preserved for the privileged class of farmers and the small and marginal farmers did not have much access to them. Similarly cash credit facilities were being extended by several public sector banks and cooperative banks to farmers with the view to improving their access to credit. Again this scheme was used only selectively. The Kisan(farmer) Credit Card[1] scheme was started by the Government of India in consultation with the Reserve Bank of India and National Bank for Agricultural and Rural Development in 1998-99 to join the features of both these schemes and to overcome their shortcomings. The Kisan Credit Card is a pioneering credit delivery innovation for providing adequate and timely credit to farmers under single window, with flexible and simplified procedure, adopting whole farm approach, including the short-term credit, medium term and long term credit needs of the borrowers for agriculture and allied activities and a reasonable component for consumption needs. Its coverage[2] is comprehensive and broad which is extended to all types of farmers(Kallur, 2005).

Features of Kisan Credit Card

Beneficiaries covered under the Scheme are issued with a credit card and a pass book or a credit card cum pass book incorporating the name, address, particulars of land holding, borrowing limit, validity period, a passport size photograph of holder etc., which may serve both as an identity card and facilitate recording of transactions on an ongoing basis. Borrower is required to produce the card cum

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[1] KCC helped farmers the required financial liquidity and avail credit when it was absolutely needed, providing in the process flexibility, timeliness, cost effectiveness and hassle free services to the farmers.
[2] Coverage of KCC with respect to operational holdings in India is more than 70 per cent.

pass book whenever he/she operates the account. Important features of the Kisan Credit Card (KCC) Scheme are as follows:-

(i) Eligible farmers to be provided with a Kisan Credit Card and a pass book or card-cum-pass book.

(ii)Revolving cash credit facility involving any number of drawals and repayments within the limit.

(iii) Limit to be fixed on the basis of operational land holding, cropping pattern and scale of finance.

(iv) Card valid for 3 to 5 years subject to annual review. As incentive for good performance, credit limits could be enhanced to take care of increase in costs, change in cropping pattern, etc.

(v) Each drawal to be repaid within a maximum period of 12 months.

(vi) Operations may be through issuing branch and also PACS in the case of Cooperative Banks through other designated branches at the discretion of bank.

(Vii) Withdrawals through slips/cheques accompanied by card and passbook.

The Literature review

The available literature on Kisan Credit Card Scheme of India is very scanty. Barik (2010) stated that realising the importance of enhancement of flow of credit to the rural sector and reduction of the dependence of farmers on non-institutional sources of credit, NABARD introduced Kisan Credit Card (KCC) scheme. Samantara (2010) mentioned that the introduction of a new credit product called Kisan Credit Card (KCC) in 1998-99 with three different sub-limits viz. production, assets maintenance and consumption needs is a step in this direction to address the challenge. Danish faruqui (2001) opined that the scheme seems well thought of and full of good intentions. Not only has availability of credit been made easier but has also been made simple to get and operate. Farmers have been given sufficient freedom to decide how to use their credit, while at the same time a set repayment schedule has been provided. However for this scheme to be successful, education of both the farmers and also the bank officials about the scheme is required.

Bhattacharyya (2005) in a study, based on a primary field survey in rural West Bengal, analysed the terms and conditions of the differentiated structure of rural credit with the advent of capitalist agriculture within the interventionist state. The sample households are classified according to the economic classes as well as the standard acreage criterion. The possibility of inter linkage between credit and all other structures is remote. The average rate of interest is inversely related to ascending

class status. There is a systematic association between rate of interest and the value of collateral on the one hand, and marketability of collateral and interest rates on the other. Chaudhuri and Gupta (1996) presented a theory of interest rate determination in the informal credit market in backward agriculture. The market for informal credit is created by the delay in disbursement of formal credit. The delay is controlled by the official of the formal credit agency, and he is bribed by the farmer to reduce the delay. The official and the moneylender play a non-cooperative game in choosing the bribing rate and the informal interest rate, respectively. The informal sector interest rate and the effective formal sector interest rate are equal in equilibrium. Agricultural price and credit subsidy policies may raise the interest rate in the informal credit market.

Sample Design and Agency-wise Share of KCC

The study is based on secondary data collected from published sources and primary data collected from the borrowers through a multistage stratified sampling design. The survey of the borrowers was carried out in Cuttack district of Odisha state in India on the basis of total number of cards issued up to March 2012. Subsequently, banks, branches and types of farmers formed three stages of sample selection within the selected district. Depending upon the size and number of KCC holders, a sample of ten farmers from each bank branch was selected using simple random sampling with due representation to various types of farmers according to their land-holding size. The final sample of KCC holders thus worked out to be 300. The data were collected with the help of pre-tested questionnaires[3]. Primary data and secondary data were tabulated and analyzed using statistical tools such as mean, standard deviation, percentage share, weighted average, growth rate, etc., to derive inferences. Economic benefits of KCC have been arrived at by estimating production gain, price gain, actual interest saved on account of enhanced credit limit and reduced average loan outstanding (due to the flexibility in

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[3] i. Bank questionnaire includes branch profile, number of KCC issued, staffing pattern, short-term credit disbursed by the branch, operational issues and difficulties associated with the implementation of the scheme and areas for further implementation.
ii. Household questionnaire includes Social groups, household size, sources of income, details of area owned and operated, household assets, cropping pattern, allied agriculture activities, costs of purchase and other inputs used at the farm, consumption expenditure, pattern of borrowings, sources of borrowings, issues related with KCC, credit limits, operational difficulties associated with the use of KCC and suggestions for further improvement of the scheme.

operation). Non-economic benefit of the KCC was assessed in terms of individual perceptions of the borrowers on the Selection of Sample Farmers

Table-1 Agency wise Farmers covered during the study

Sl No	Agency	Number of selected farmers
1	Regional Rural Banks	100
2	Co-operative Banks	80
3	Commercial Banks	120
	Total	300

The commercial banks have provided maximum number of Kisan credit cards in India followed by regional rural Banks and Cooperative banks. The present study covers 100 farmers from RRB, 80 from cooperative bank and 120 from commercial banks who had availed kisan Credit Cards.

Table – 2 Agency-wise Share of Kisan Credit Card (KCC) in India

year	Cooperative Banks	Regional Rural Banks	Commercial Banks	Total
1998 - 1999	1.55 (19.77)	0.06 (1.01)	6.22 (79.22)	7.84 (100)
1999 - 2000	35.95 (70.02)	1.73 (3.37)	13.66 (26.61)	51.34 (100)
2000 - 2001	56.14 (65.90)	6.48 (7.50)	23.9 (26.60)	86.52 (100)
2001 - 2002	54.36 (58.20)	8.34 (8.92)	30.71 (32.88)	93.41 (100)
2002 - 2003	45.79 (55.56)	9.64 (11.68)	27.00 (32.76)	82.43 (100)
2003 - 2004	48.78 (52.75)	12.74 (13.79)	30.94 (33.46)	92.47 (100)
2004 - 2005	35.56 (36.73)	17.29 (17.86)	43.96 (45.41)	96.80 (100)
2005 - 2006	25.98 (32.43)	12.49 (15.59)	41.65 (51.98)	80.12 (100)
2006 - 2007	22.98 (26.99)	14.06 (16.52)	48.08 (56.49)	85.11 (100)
2007 - 2008	20.91 (24.69)	17.72 (20.92)	46.06 (54.39)	84.70 (100)
2008 - 2009	13.44 (15.64)	14.14 (16.46)	58.34 (67.90)	85.92 (100)

| 2009 – 2010 | 17.43 (19.36) | 19.49 (21.65) | 53.13 (58.99) | 90.06 (100) |
| Total | 378.87 (40.45) | *134.21 (14.33)* | *423.63(45.22)* | *936.72(100)* |

Source: RBI Report on Trend and Progress of Banking in India 2009-10

Figures in brackets indicates percentages

Fig – 1 Trend of Agency wise issue of Kisan Credit Cards
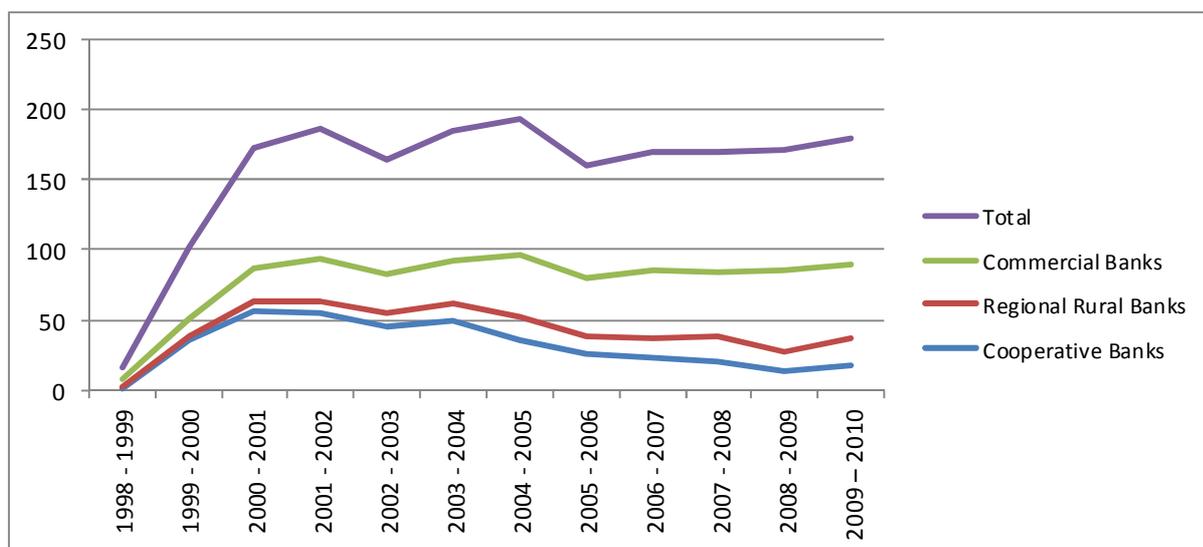
Total number of KCCs issued till end-March 2010 is 936.72 lakhs in India. Since the inception of the scheme (1998-99), the largest percentage of KCC has been issued by commercial banks. It is observed that there has been a more or less steady increase in the number of cards issued through commercial banks since the scheme was started. It is interesting to note that the number of cards issued by cooperative banks from the inception period increased till 2001 but it has witnessed a declining trend since 2001-02, after peaking in 2000-01. Consequently, there has been a steep fall in the share of cooperatives banks between 2000-01 and 2009-10 from 65.90 per cent to 19.36 per cent. Due to the investment credit needs of farmers in the year 2001 after the introduction of insurance scheme, co-operative banks constituted 58.2 per cent, followed by commercial banks (32.88 per cent) and RRBs (8.92 per cent). During 2004-05,i.e after introducing the term loans, there was the highest issue of cards as observed from 1999 to 2010, and during this period the commercial banks accounted for the largest

share (45.41per cent), followed by Cooperative banks (36.73 per cent) and RRBs (17.86 per cent). The commercial banking sector has made the most significant progress in expanding the KCCs . The share of Commercial Banks (CBs) was maximum 45.22 per cent in total KCC issued followed by Co-operative Banks 40.45 per cent and minimum was RRBs, 14.33 per cent during the period. The trend of KCC issued by various banks are shown in fig-1.

Impact of Credit under KCC on Cost of Cultivation and Output

Sample KCC holders across the States had cultivated one major crop (paddy) by availing crop credit from different agencies. Average productivity per hectare of this crop taken up by KCC holders was compared with the average yield level of 'control' farmers. Control farmers were non KCC holders and tenant farmers who had availed loan from informal sources but not under KCC scheme. The overall productivity of paddy grown by KCC holders was higher by 13.3 percent as against the yield level by control farmers. The whole of the yield increase was partly attributed to the credit access through KCC. The adequate application of comparatively higher doses of inputs like fertiliser, manure, pesticide, labour, irrigation waters, etc. by KCC farmers are contributing factors for improvement of yield level. The cost of cultivation and gross value of output for sample KCC holders per hectare are calculated in the study. It is observed from that gross value of output per hectare was higher for paddy (14.2 per cent) cultivated by KCC holders as compared to the control farmers. The cost of cultivation per acre was higher by 8.2 per cent for paddy. The cost of cultivation was higher for KCC farmers on account of comparatively higher doses of application of various inputs resulting in higher yield by KCC farmers as compared to the control farmers under paddy crop. However, the control group (mostly tenant farmers) might not have availed credit through KCC, but has been availing credit from informal sources. Some of the owner farmers were passing on the KCC limit sanctioned to them to these tenant farmers. Therefore, any differential in yield, cost of cultivation, etc. may not be directly attributed to the issue or non-issue of KCC limits. The real cost of credit were estimated based on the primary data collected during the study. This cost includes charges on various documents required for sanction of loan, payment of fees for issue of card, seeking legal opinion and opportunity cost of the borrower.

Determinants of Credit

The determinants of credit requirement under KCC is important because it was observed that farmers did not fully utilized their cards in availing credit. Hence cross-sectional multiple step-wise regression analysis was used to study the determinants using data for the 300 sample KCC farmers. Among the explanatory variables, cost of cultivation, consumption loan, loan for a Non-farm sector activities were used in the study. In regression model, the intercept term has been allowed to vary across the cost of cultivation over time using dummy variables (KCC holders and Non-KCC holders) , so as to pick up difference in crop productivity. Credit requirement, the dependent variable is frequently influenced not only by variables that can be readily quantified on some well-defined scale (i.e. cost of cultivation, consumption requirement, loans required non- farm sector activities, etc.), but also by variables that are essentially qualitative in nature (i.e. KCC holders and Non-KCC holders). Since such qualitative variables usually indicate the presence or absence of an attribute (in the present study it is either KCC holders or Non- KCC holders), one method of 'quantifying' such attribute is by constructing artificial variables that take on values of 1 or 0, 0 indicating the absence of an attribute and 1 indicating the presence (or possession) of that attribute. Variables that assume such as 0 and 1 value are called dummy variables.

Econometric Model

To analyse the determinants and their degree of influence ,the ordinary least square model has been applied to analyse the factors accountable for total credit requirement (aggregate of crop loan, consumption loan and loan required for allied and NFS activities). The log linear model was used to find the elasticity directly and for other advantages. The functional form of the model in log-linear form is:

$CR = f\text{i}(X_{ij})$ or $CR = f\text{j}(C, L, N)$

Where i, stands for individual KCC holders; j for exogenous variables;

CR = Credit Requirement,

X_j = exogenous variables i.e. cost of cultivation, consumption loan, & loan for a Non-farm sector

U_j = random unobserved disturbance with zero mean and a constant variance.

By taking log-linear function, the model becomes;

$$\text{Log } CR = \text{Log } \alpha + \beta_1 \text{ Log } C + \beta_2 \text{ Log } L + \beta_3 \log N + \xi$$

Where, α = Constant term, C = cost of cultivation, L = consumption loan, N = loan for Non-farm sector & ξ = error term

The dummy variable technique is an econometric method to include qualitative variable in the model. The dummy variable has been used to handle qualitative variable i.e. KCC holders and non-KCC holders.

The above function can be written as

$$CR = \alpha + \beta_1 C + \beta_2 L + \beta_3 N + \beta_4\ D4 + \xi$$

Where,   D4 = 1 if, KCC holders

        = 0, otherwise

In ANOVA model, the regression model contains explanatory variable that are exclusively dummy, or qualitative, in nature. For example, the following model can be taken :

$$Y_i = \alpha_i + \beta_i D_i + \xi_i$$

Where, Y = Crop yield,

Di = 1 if, KCC holders

        = 0, otherwise

The results corresponding to above regression are as follows:

$$\hat{Y}_i = 19.46 \qquad + \ 4.57\ D_i$$

$$t = (56.84) \qquad (7.439) \quad R^2 = 0.7724$$

As these results show, the estimated mean yield (Quintals/Hectare) of Non-KCC holders is 19.46 Qtls./Hectare. and of KCC holders is 24.39 Qtls./Hectare. . Since $\hat{a}_i$ is statistically significant, the results indicate that the mean yield level of the two categories (KCC holders & Non-KCC holders) is different. When all other variables are held constant, it can be concluded that there is a significant difference in the yield level of the two categories. However, the present model is too simple to answer this question definitely, especially in view of the cross-sectional data used in the analysis. To draw the best-fit regression equation, the method of stepwise regression was used. This procedure evaluates each variable in turn on the basis of extent of correlation (Correlation matrix) and accumulates the model by adding variables sequentially. The variable having highest correlation with the dependent variable could be added to the model first, then the second best or so on. Variables are added as long as R^2 is increasing.

To avoid the problem of multi-collinearity[4], we dropped many variables from the model and selected only three variables.

Table- 3   Statistical results of step-wise regression model

Variables	C	L	N
Co-efficients	0.4428*	0.2241*	0.1236**
't' value	2.83	2.71	1.97

Source- Author's Calculation

R^2 = .9724, $\acute{R}^2$ = .9614, 'F' value = 88.19, 'D' statistic = 2.34 D L = 0.525 DU = 2.016

* Significant at 5% level . ** Significant at 10% level

The estimated elasticities β_i for all the variables with respect to total credit requirement for the sample KCC holders are presented in Table-3. It is observed from the table that Cost of Cultivation (0.4428) as a whole influence significantly to the credit requirement compared to other variables, i.e. Consumption Loan (0.1236) and Loan for allied and Non-farm sector (0.2241).

Table- 4 Statistical results of regression model having dummy variables – KCC holders

Variables	Co-efficient	S.D	t-ratio
Constant	36.27		
Cost of Cultivation	0.3541	0.138	2.487
Dummy Variable	164.38	3.578	23.88
	D.F - 296	R^2 = 0.37	$\acute{R}^2$ =0.29

Source- Author's Calculation

* Significant at 5% level , ** Significant at 10% level

In the above model, there are one quantitative explanatory variable, cost of cultivation and one qualitative variable. Coefficients of all these variables are statistically significant at the 5% level.

Average level of credit requirement of Non KCC holders (i.e. when the dummy variable takes a value of zero) and average level of credit requirement of KCC holders (i.e. when the dummy variable is equal to 1) are

$$CRi = 36.27 + .3541 \ Ci \text{ ------------------(I)}$$

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[4] Multi- collinearity occurs where there is strong relationship among explanatory variables. Step wise regression helps to identify correlation among explanatory variables.

$$CR_i = 212.65 + 0.3541 \ C_i \ \text{----------------(II) respectively.}$$

For significance, we have used various statistical tools like "t" value and R^2. For cross section analysis, we have taken care of the multi- collinearity problem by taking one variable at a time considering the high value in correlation matrix.

Table-5 Correlation Matrix of Variables

variables	CR	C	L	N
CR	1.0000	0.5823	0.1528	0.2783
C	0.5823	1.0000	0.3468	0.6627
L	0.1528	0.3468	1.0000	0.4677
N	0.2783	0.6627	0.4677	1.0000

Source- authors Calculation

Table – 5 reveals that correlation coefficient of credit and cost of cultivation is 0.5823, with consumption loan is 0.1528 and with non farm loan is 0.2783. Hence cost of cultivation increases with increase in credit under KCC. The explanatory variables are also positively correlated. The coefficient of correlation between cost of cultivation and non farm sector loan is 0.6627. So existence of multicollinearity is evident from table-4.

Conclusion

It is observed that Kisan credit Card provides hassle free access to institutional loans to farmers effectively which resulted in increasing productivity of paddy crop (13.3 per cent) compared to the corresponding yield of non-KCC holders. However, the whole of the yield increase was partly attributed to the credit access through KCC. The adequate application of comparatively higher doses of inputs like fertiliser, manure, pesticide, labour, irrigation waters, etc. by KCC farmers are contributing factors for improvement of yield level. However, there were quite a number of findings reflecting few areas of concern. It can also be deduced that quite a significant number of new borrowers had been demanding KCC every year due to its flexibility in usage and other utilities like, flexible drawals, flexible repayment patterns, coverage under NAIS/PAIS, minimum margin/ security norms, etc. About 17 per cent of the average loan under KCC was being used for non-production (consumption) purposes. Agency-wise, sample KCC holders from Co-operative Banks had utilised about 6 per cent of their

average loan disbursed for consumption purposes, as against 18 - 20 per cent in case of both commercial banks and RRBs. A staggering 78 per cent of the total sample respondents responded that KCC was truly a hassle free card. Agency-wise, majority of KCC holders from commercial banks (81 per cent) viewed that KCC was hassle free followed by RRB (76 per cent) and Co-operative Banks (68 per cent). During the interaction with the farmers it was gathered that KCC holders got some relief in terms of sanctioning credit limit once in three years and drawing the limit once in a year. Cost of cultivation is the most significant determinant of credit requirement under Kisan Credit Card scheme.

It suggested that introduction of biometric cards, deployment of Banking Correspondence (BCs), simplification of procedure, financing through Joint Liability Groups (JLGs) mode, Weather-based Crop Insurance Scheme with Cyclical credit may go a long way in providing more relief to the distressed farmers. The add on features on KCC could be further improved in terms of extending other loan such as consumption loan, term loan in the ratio of 4:2:1 and evolve the KCC into a truly multipurpose card. There is a need for more proactive initiatives by the commercial banks, state governments in promotion of Self Help groups, Farmers' Club and Innovative Insurance Products, etc., and adoption of "Mission Mode" approach to make KCC into a farmers' friendly efficient instrument for credit delivery system.

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