Determinants of the efficiency of Microfinance Borrowers and non-borrowers: Evidence from Pakistan

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Abstract
This study explores, whether micro finance is being efficiently used or not. As it has been observed that most of the micro finance is used for the non productive purpose. Where as the purpose of lending this credit is to finance the borrowers so that they could enhance their output and inputs. Data Envelopment Analysis was used in this study to find the efficiency scores of the borrowers. There after, Tobit regression was used in the second stage to explore the determinants of the efficiency. A total of 122 traders of micro level including 43 borrowers and 79 non-borrowers were interviewed to fill the questionnaires. While comparing microfinance borrowers with non-borrowers, it was found that microfinance borrowers were significantly more efficient than the small scale borrowers. Average Propensity to Consume (APC) is one of the major factors that has a negative impact on the efficiency. Education was found to have a positive impact on the technical efficiency of the traders. People are generally quite reluctant to take the loan from microfinance institutions due to insufficient amount offered, high interest rate and return of loan in monthly installments. That make the loan less efficient. Therefore it has been recommended the microfinance institutions to overcome these problems.
Key Words: Efficiency, Microfinance, Data Envelopment Analysis, Tobit Model.

Introduction

In a developing economy like Pakistan, people are generally trapped in the vicious circle of poverty. Low income result in very low savings due the high percentage of income spent on consumption expenditures. Therefore access to the credit plays an important part to take these people out of this trap. Commercial banks are usually quite reluctant to give loans to such people owing to little amount of credit demanded. Therefore microfinance institutions fulfill the credit requirements of the poor people. Micro credit may have a dual influence on the performance of a micro enterprise. First if this loan is utilized properly on the business at the right time, it may increase not only its efficiency but it would also increase the income of the entrepreneur significantly. Secondly if this loan is misused for either for non productive purpose or it at wrong time due to the late approval of the loan, it may have negative impact on the income, productivity and the efficiency of an entrepreneur. This study focuses not only on the beneficiaries of microfinance institutions but also on those micro level business men who neither take loan from commercial banks due to either lack of collateral or small amount of loan demanded nor do they benefit from microfinance institutions due to insufficient amount offered by MFI, return of loan in installments and high interest rate. In Pakistan commercial banks generally do not give loan of an amount less than one to 1.5 million. Whereas MFI offer an amount maximum up to 150000. Therefore people asking for an amount from 150000 to one million can not benefit from either of the two financial systems. Micro finance can be defined as the provision of different financial services at the larger level like insurance, money transfer and credit to the households having low income (ADB 2000). Low income can be defined differently on the basis of area and the country. Microfinance is the availability of different financial services like credit, saving, money transfer, payment services and insurance to the low income people and women in the long run (Zafar et al. 2009). Microfinance can also be defined as provision of loans, insurance and money transfer facility to the micro and small level business or where the commercial banks face heavy transaction cost. In his presentation by Anjum Ahmad (SMEDA Pakistan 2009) described the definition of micro, small and medium enterprises according to the different institution. The definition of Micro, Small and medium business by Small and Medium Enterprise Development Authority (SMEDA) is the most comprehensive. Micro level business has been defined as an enterprise that has less than 10 employs and has productive assets of less than 2 million. Small scale entrepreneur has 10 to 35 employs and average value of stock of 2 to 20 million. While medium size firm hire less than 100 employees and have productive assets of less than 4 million Pakistani Rupee. The case study for this research is Faisalabad District. Faisalabad is the 3rd largest city of Pakistan after Karachi and Lahore in terms of population while it is the 2nd most congested city after Karachi according to the 1998 census. According to the recent estimates, population of the city Faisalabad is about 4 million twice as high as it was in 1998 census. According to the 1998 census population of city Faisalabad was growing by 21% per year.

The reason of choosing Faisalabad is the rapid economic growth in the city during the last few decades.

Objectives of the study

➢ To find the efficiency scores of microfinance borrowers and non-borrowers.
➢ To find the determinants of the efficiency scores.

In the end to give such policy recommendations and suggestions, that may lead to efficient use of micro finance and to analyze the performance of microfinance institutions.

Review of Literature

Bhasin and Akpalu, (2001) explored the efficiency of wood-processors, tailors and hair dressers. Major factors that affected their efficiency were found to be age, experience of the business, education level, training programs and credit. Credit participation had a positive and the significant impact on the efficiency of all the three categories of micro entrepreneurs. Trillo, et al. (2005) used Stochastic Frontier Production function approach to find the inefficiencies of different micro enterprises. Entrepreneurs who took loan from banks or through formal way were found to be more efficient than those who relied on their family members or friends etc through informal way. One of the reason behind was the screening policy by the banks. Nghiem et al. (2006) Used Data Envelopment Analysis to check the efficiency of 46 microfinance schemes that they surveyed in his research. They used poverty approach rather than production approach to see the efficiency of microfinance. Average technical efficiency score was recorded at 80% of the schemes. Age and the location of the schemes were found to have the significant impact on the efficiency of the microfinance using 2nd stage regression. Akanni, (2007) investigated the effect of microfinance on small scale Poultry business in South West Nigeria. Out of the total sample, 29% took loan from co-operative societies. Education level, business experience and number of birds in the farm were positive and significant. Funds intensity was highest for usage of inputs while it was lowest for the business experience. Shirazi and Khan (2009) described the role of PPAF and microfinance in reducing poverty. It was concluded that micro credit cut down the Poverty by 3.05 percent. Adams and Bartholomew, (2010) studied the role of microfinance in reducing poverty. A sample of 100 microfinance borrowers was taken of maize farmers. The impact of microfinance on socioeconomic well being was found to be quite minor due to lack of entrepreneurial skills. Nudamatiya, et al. (2010) investigated the relationship between change in income and micro credit. Regression coefficient of 0.35 showed positive and significant relationship between microfinance and change in income. Saleem and Jan (2011) stressed the need to adopt new technology in the agriculture sector that requires credit. Cobb-Douglass linear regression was used on the data from 1990 to 2008. credit used for cede, fertilizer, pesticides, irrigation and tractors were strongly related with the agriculture gross domestic product. Impact of credit on agriculture production was found to be more than 80%. Thereby it was concluded that credit access had a very significant role in increasing agriculture productivity. Oni, et al. (2011) explored the determinants of the efficiency of poultry farmers using micro credit in one of the states of Nigeria applying SFA technique on a sample of 115. micro credit was found to have a positive and the significant impact on the technical efficiency. Ayaz, et al. (2011) found the efficiency scores of the different farmers in district Faisalabad using the Data Envelopment Analysis technique. Mean efficiency of the over all farmers was 0.78 or 22% inefficiency. efficiency scores were then regressed by different farm related variables through Tobit regression. Credit access was a significant positive factor to increase the efficiency score. Akram and Husain, (2011) explored the contribution being made by microfinance to remove poverty in district Okara. Microfinance was found to have a positive and the significant impact on the level of income. Sumelius, et al. (2011) computed the profit efficiency of different rice farmers in Bangladesh. Cob-dugless stochastic profit function frontier analysis was carried out to find the profit efficiency and loss in profit using the data of 360 farms in the growing season of 2008 to 09. It was found that the profit efficiency of the microfinance borrowers was 68 percent, where as for the non borrowers it was 52 percent. That showed significant improvement in the efficiency due to the borrowing. Islam et al. (2011) explored the efficiency of the beneficiaries and non beneficiaries of microfinance of the Rice farmers in Bangladesh using DEA approach. Mean score for the technical efficiency was recorded at 72%, for Allocative it was 66% and for Economic efficiency it was 46%. Efficiency scores of microfinance borrower and non borrowers were considerably different from each other. Alex, (2012) assessed the role of microfinance to reduce the poverty using both primary and the secondary data. Microfinance had a positive impact to alleviate poverty. Akpalu, et al. (2012) explored that mean technical efficiency was found to be 40% indicating that output could easily be doubled or in excess of doubled without make using of further inputs. Efficiency of the enterprises increased by 11% by using microfinance.

Data and Methodology

Data Description: Data was collected from different micro finance beneficiaries and non beneficiaries by the help of a questionnaire. From the non-borrowers same questionnaire was used excluding the questions related to loan. Micro level shopkeepers whose average value of stocks are less than 2 million according to the definition of SMEDA were chosen for this study. A sample of 122 micro level shop keepers using Simple Random Sampling Technique including 43 borrowers and 79 non-borrowers.

Variables of the Econometric Analysis

Variables of the 1st Stage: To find the efficiency score of each trader profits per month have been taken as the output where as cost on different factors of production have been taken as the inputs. Cost has been taken due to two reasons, firstly because it represents the quality of input and secondly to remove the heterogeneity in the data. One output and five inputs have been taken to apply DEA. Net profit of each trader has been taken after subtracting interest from it and has been used as the output. Cost on labour has been taken in Rupees per month. If the shopkeeper is himself running the shop, then opportunity cost equivalent to 8000 has been added in cost of labour. Interest of the capital that has been borrowed per month plus the opportunity cost of the capital that is owned has been taken as the 2nd input. Opportunity cost of the capital has been calculated by taking 8% deposit rate offered by the commercial banks on average. Rent of the building has been taken as the 3rd input. If the trader has his own shop then opportunity cost has been taken equivalent to market rent. Cost on utility bills has been taken as the forth input. Traders usually face electricity bills only. Cost on payment to the supplier has been taken as the 5th input. It has been measured by taking the average value of the stocks. Transportation cost has been summed up in it as the usually the producer supplies the product by own and includes the transportation cost in the price of that product. Those who bear transportation cost then selves, their cost has been summed up in payment to the supplier.

Variables of the Second Stage, Regression: Different variables were kept as the regressors in the 2nd stage to find the determinants of efficiency. House ownership, shop ownership, type of customer, scale of the business have also been quantified by creating dummy variable. However education and business experience have been taken in years.

Hypothesis: The main hypothesis of this research is to see whether borrowing is a significant determinant of efficiency. So the null hypothesis is that borrowing has an insignificant impact on the efficiency against the alternative that efficiency is being significantly determined by the credit.

Approaches of measuring efficiency: Berger and Humphey describe two approaches, Parametric and Non-parametric approach to measure efficiency. Parametric approach requires functional form and it assumes disturbance term. It is calculated by Stochastic Frontier Analysis. Non-parametric approach requires no functional form and it does not assume any disturbance term. It is calculated by Data Envelopment Analysis.

Data envelopment analysis: Term of Data Envelopment Analysis was first introduced by Charnes et al 1978. But its concept has been taken from the work carried out by Forrell 1957. It is a non parametric technique which gives productive efficiency scores of each producer or entrepreneur. Non-parametric technique does not assume any specific shape of Frontier curve but on the other hand it does not estimate any relationship or the equation between input and output. It may b used to compare the efficiency across producers or entrepreneurs. There are mainly two types of DEA, one which is based on the CRS (Constant Return to Scale) and the other which is based on VRS (Variable Return to Scale). Data Envelopment Analysis can be run by either cost minimizing method or output maximizing method. In cost minimizing method, output is fixed and on that output, cost is minimized. Where as in output maximizing method cost is kept fixed and output is maximized.

Parametric technique: Parametric technique requires the functional form. Stochastic Frontier Analysis is used to measure the efficiency and inefficiency scores by assigning the functional form. SFA gives both efficiency scores in the 1st stage as well as 2nd stage parametric equation.

Tobit Regression: 2nd stage regression was used in this study keeping efficiency scores as the depended variable. As the efficiency scores take the values from 0 to 1. So it is left censored at 0 and right censored at 1. So applying OLS on such model may lead to biased results. Therefore Tobit model is best fit on such functional form. Tobit model was first introduced by James Tobin in 1958 which describes the relationship between non negative depended variable and explanatory variables or vectors. Tobit model assumes error term to be normally distributed. However E-views provides further option of the error term to be either logistic or skewed in nature of the censored regression. Applying OLS on an equation having censored depended variable gives inconsistent estimators. Such slope coefficients estimated by OLS are downward biased. Whereas intercept obtained by OLS is upward biased. It has been proven by Amemiya (1973) that Maximum Likelihood estimators proposed by James Tobin are quite consistent. Following equations were estimated by using Tobit Regression.

$$VRSTE = \beta_0 + \beta_1(Cred) + \beta_2(TCus) + \beta_3(BExp) + \beta_4(Edu) + \beta_5(BOwn) + \beta_6(HOwn) + \beta_7(APC) + \mu$$

$$CRSTE = \beta_0 + \beta_1(Cred) + \beta_2(TCus) + \beta_3(BExp) + \beta_4(Edu) + \beta_5(BOwn) + \beta_6(HOwn) + \beta_7(APC) + \mu$$

VRSTE = Variable Returns to Scale Technical Efficiency.
CRSTE = Constant Returns to Scale Technical Efficiency.
BOwn = ownership of business premises.   HOwn ownership of house.
BExp = Business Experience in years.   Credit = Credit Access.

TCus = type of customer.   APC = Average Propensity to Consume.

Results and Discussion

Descriptive Analysis: Just 5 traders out of total 122 traders were running their business on partnership and the rest were working on sole, showing a very low percentage of the traders working under partnership. Whereas 83.6% of the traders were retailers while the rest were wholesalers. A large majority of the 83 shopkeepers were working in a rented shop while only 39 had their own shop. However about 85% respondents had their own house.

Table 1: Information of the Respondents

Demographic Factors	Minimum	Maximum	Average	Std Deviation
Age	20	64	42.11	9.94
Education	5	16	9.85	2.99
Family Size	2	11	6.54	2.03
Number of Earners	1	4	1.72	0.80
Income	10000	140000	60400	40212.07
APC	0.3733	1.00	0.77	0.15
Business Experience	1	38	14.89	7.75
Total Experience	1	40	16.26	8.52

Average age of the shopkeepers were found to be about 42 years. Most of the traders were under matric. Family size was found to be 6.54 on average. Whereas most of the respondents had 1 to 2 earners in their family as shone by the average and it's standard deviation. Standard deviation of family income and Average Propensity to Consume has been found quite high. Experience of the traders whether it was current business related or total business experience have wide range.

Data Envelopment Analysis: Data Envelopment Analysis technique was applied by taking 122 micro entrepreneurs sample whose average stocks were 100000 to maximum up to about 2 million. Forty three of them were borrowers where as 79 were non-borrowers. Monthly profits were taken as out put and monthly cost on labour, building rent, utility bills, interest of capital and payment to the supplier were taken as inputs. Output oriented technique was applied. As the objective of the borrowers is to maximize the profits.

Table 2: Results of DEA

Descriptive Statistics	CRSTE	VRSTE	SE
Mean	0.6402	0.7191	0.8976
Std. Deviation	0.2187	0.2274	0.1358
Minimum	0.138	0.138	0.3
Maximum	1	1	1

As the above table shows that Constant Return to Scale Technical Efficiency (CRSTE) of micro level shopkeepers was found to be 0.6402 or 64.02%. in other words 0.3598 or 35.98% inefficiency. Where as according to Variable Return to Scale Technical Efficiency (VRSTE) is 0.7191 or 71.91%, which reflects that the shopkeepers are 0.2909 or 29.09% inefficient. How ever scale efficiency is much higher than the other two and stands at 0.8976 or 89.76%. it is a notable point that range from minimum to maximum efficiency is same for Constant Return and Variable Return to Scale.

Table 3: Distribution of the Returns

Operating Under	DRS	CRS	IRS	Total
Frequency	14	28	80	122
Percentage	11.48	22.96	65.57	100

A large majority of the shopkeepers are working under increasing return to scale. Who therefore need to mobilize its resources to maximize its profits. 23% of the shopkeepers were operating under Constant Return to Scale or in other words in the 2nd stage. Very few of the traders were over utilizing their resources. Traders working under Decreasing Return to Scale were about 11.48%.

Tobit Regression

Table 4: Impact of Different Demographic and Economic Factors on VRSTE.

Dependent Variable: VRSTE

Method: ML - Censored Logistic (Quadratic hill climbing)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
CREDIT	0.22518	0.05601	4.020655	1E-04
TCus	0.046637	0.06097	0.764947	0.444
LOG(BExp)	-0.12632	0.03955	-3.19403	0.001
BOwn	0.055121	0.04462	1.235224	0.217
LOG(EMPLOY)	-0.24049	0.06651	-3.61572	3E-04
LOG(EDU)	0.134719	0.07287	1.848832	0.065
HOwn	0.198051	0.05933	3.338027	8E-04
APC	-0.3083	0.17225	-1.78982	0.074
C	0.885697	0.27875	3.177432	0.002

Above table shows that microfinance borrowers were found to be 0.22 more efficient than non-borrowers as shone by the coefficient of credit in the above table. And it is highly significant even at 1% level of significance. shopkeepers whose customer are general public were 0.04 more efficient than those whose customer were retailers but insignificantly even at 10% level of significance. business experience was found to be significant factor to determine the efficiency at 1% significance level. The reason behind is that traders of younger age were more efficient than the older as the younger traders are more educated, therefore they are more efficient. Education is positively related with efficiency and it is significant at 10% level of significance. shopkeepers having their own shop were insignificantly more efficient than the shopkeepers having rented shop. However shopkeepers having their own house were far more efficient and found to be 0.19 more efficient than shopkeepers having rented house at even 1% level of significance. Average Propensity to Consume (APC) obtained by dividing the domestic expenditures by their total income, was also turned to be a significant determinant of Efficiency. APC has a negative impact on the Variable Returns to Scale Technical Efficiency (VRSTE) and it is significant at 10, 5 and 1% level of significance. reason behind is that with an increasing prices traders have to invest more and more in their shops. So the shopkeepers having higher APC investment less on their business, as a consequence their profits decrease.

Table 5: Impact of Different Demographic and Economic Factors on CRSTE.

Dependent Variable: CRSTE

Method: ML - Censored Logistic (Quadratic hill climbing)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
CREDIT	0.345123	0.043376	7.95646	0
TCus	0.042479	0.048844	0.869678	0.3845
LOG(BEXP)	-0.07788	0.029751	-2.617771	0.0089
BOwn	0.075918	0.035281	2.151821	0.0314
LOG(EMPLOY)	-0.033583	0.051713	-0.649408	0.5161
LOG(EDU)	0.11328	0.057004	1.987241	0.0469
HOwn	0.102662	0.045414	2.260554	0.0238
APC	-0.457943	0.130367	-3.512734	0.0004
C	0.696853	0.209944	3.319226	0.0009

Keeping Constant Return to Scale Technical Efficiency as the depended variable, it was found that results remained very much the same as discussed in the above table keeping VRSTE as a depended variable. Sign of the variables were exactly the same as in the earlier table, however ownership of business premises (BOwn) turned out to be significant in this model. Where as Number of labour (proxy for size of business) turned out to be insignificant in this model.

Conclusion and suggestion

Main Findings: Comparing the efficiencies of borrowers and non-borrowers among micro entrepreneurs by introducing dummy variable in the 2nd stage, censored regression, it was concluded that borrowers were Far more efficient than non borrowers. As after the inclusion of loan in their business micro entrepreneurs became more efficient and reached in the Constant Returns to Scale situation. Average Propensity to Consume (APC) was negatively and significantly related with efficiency. Among borrowers higher APC forces to make more fungible use of the credit. Higher APC among non-borrowers results in low savings and ultimately due to higher inflation during last few years, worth of the capital invested in the business reduces. Education was found to be a positive and a significant determinant of efficiency. as entrepreneurs having higher education make better use of the resources available to them. Business experience had a negative impact on the efficiency. reason behind is that shopkeepers of younger age are more educated therefore make better use of the resources.

Performance of Microfinance Institution: Performance of the microfinance institutions has been found to be quite unsatisfactory. Traders who are infect interested to take the loan to improve the efficiency of their business and interested to take loan from any of the microfinance institution after being rejected by the commercial banks due to insufficient amount demanded for. Whereas microfinance institutions provide a very little amount of loan of less than 100000 to 150000. whereas commercial banks fixed the lower limit down to 1 million to one and half million due to high transaction cost. So the businessmen interested to take the loan from 200000 to 1 million are deprived of the loan or have no access to the credit. Interest rate of the microfinance institutions is usually quite high and more than the commercial banks due to the high risk involved. Contradictory to the commercial banks, loan is returned in installments to the microfinance institutions. Which again reduces loan efficiency. by the help of an example, it may be realized that loan taking from MFI is not useful for trading business.

A shopkeeper who has an average stock of 300000 in his shop, wants to invest 100000 more in the business. At this stage of the business, he would earn 3 to 4 thousand extra per month. If he takes the loan from any of the Microfinance institution at the interest rate of 20% at the start of the year . he would get profit as shone by the following table.

Table 6: Efficiency of Loan Returned in Installments

Month	Loan Amount	installment	amount returned	Profit by 3%	Profit by 4%	profit by 5%
1st	100000	10000	10000	3000	4000	5000
2nd	90000	10000	20000	2700	3600	4500
3rd	80000	10000	30000	2400	3200	4000
4th	70000	10000	40000	2100	2800	3500
5th	60000	10000	50000	1800	2400	3000
6th	50000	10000	60000	1500	2000	2500
7th	40000	10000	70000	1200	1600	2000
8th	30000	10000	80000	900	1200	1500
9th	20000	10000	90000	600	800	1000
10th	10000	10000	100000	300	400	500
11th	0	10000	110000			
12th		10000	120000			
total		120000		16500	22000	27500

As the above table shows that if the trader gets the profit by 3%, he would earn Rs 16500, whereas he has to pay Rs 20000 in the form of interest. So the net profit would be Rs -3500, which means he has to face loss. Whereas he would get benefit of Rs 2 thousand and 75 hundred if he earns the profit by 4% and 5% respectively. . so the loan taken from any microfinance institution will only be beneficial if the trader is sure to get profit by more than 4% from that loan amount of Rs 100000. if that same loan is returned in a one go after a year with the interest. The same trader would earn Rs 36000 in a year by a profit of 3% only. So in this way returning loan in 1 go is far more beneficial than returning it in installments. Microfinance institutions do not inspect or look after the business of the borrowers like the commercial banks to confirm whether that loan amount is being properly used or not in the business. Which allows the borrower to make fungible use of the credit. So therefore high percentage of loans taken from MFI's are used for non productive purpose.

Policy Recommendations: Number of policy measures can be taken to increase economic activities. Microfinance institutions need to increase upper loan limit up to about 500000. whereas commercial banks should give loans from 500000 to 1 million on providing personal guarantee. Recovery of loans given on personal guarantee may be ensured by making laws of punishment etc. Return of loans should be in one go rather than installments. Interest rate should be tried to decrease. There should be workshops arranged for the borrowers to make best use of the credit and resources. Proper inspection by the Microfinance Institutions and the commercial banks is needed to be done to ensure best use of the credit. As it is evident by the results that

education is positively related with the efficiency of the entrepreneurs, therefore it is recommended to promote not only the general education but also the business related education and the short courses.

References

Adams, S. and Bartholomew, T. A., (2010) The Impact of Microfinance on Maize Farmers in Nkoranza (Brong Ahafo Region of Ghana) *Journal of Management Research,* 2(2): 1 – 13.

Akanni, A. K. (2007) Effect of Microfinance on Small Scale Poultry Farmers in South Western Nigeria *Emir Journal of Food and Agriculture,* 19(2): 38-47.

Akram, M. and Hussain, I., (2011) The Role of Microfinance in uplifting Income Level: A study of District Okara –Pakistan *Interdisciplinary Journal Of Contemporary Research In Business,* 2(11): 83 – 94.

Akpalu, W., Alnaa, E. S. and Aglobitse, B. P. (2012) Access to microfinance and intra household business decision making Implication for efficiency of female owned enterprises in Ghana, *The Center for Environmental Economics Research & Consultancy, (CEERAC) Working Papers No. 003.*

Alex, A. K., (2012) Microfinance and Poverty Reduction in Ghana: The Case of Central Region in Ghana *Asian Economic and Financial Review,* 2(1): 135 - 141.

Amemiya, T. (1973) Regression analysis when the dependent variable is truncated normal, *Econometrica (The Econometric Society)* 41 (6): 997–1016, doi:10.2307/1914031, http://www.jstor.org/stable/1914031

Asia Development Bank (2000) Finance for the Poor: Microfinance Development Strategy, Manila.

Ayaz, S., Anwar, S., Sial, H. M. and Hussain, Z. (2011). Role of Agricultural Credit on Production Efficiency of Farming Sector in Pakistan: A Data Envelopment Analysis. *Pakistan Journal of Life and Social Sciences,* 9(1): 38-44.

Berg, S. (2010) Water Utility Benchmarking: Measurement, Methodology and Performance Incentives *International Water Association.*

Berger, A.N. and D.B. Humphrey (1997) Efficiency of Financial Institutions: International Survey and Directions for Future Research *European Journal of Operational Research,* 98: 175-212.

Bhasin V. K. and Akpalu W., (2001) Impact Of Micro-Finance Enterprises On The Efficiency Of Micro-Enterprises In Cape Coast. *IFLIP Research Paper 01-5, International Labour Organization.*

Charnes, A., W. Cooper, & E., Rhodes (1978) Measuring the Efficiency of Decision Making Units *European Journal of Operational Research,* 2: 429 – 444.

Farrell, M.J. (1957) Measurement of Productive Efficiency *Journal of Royal Statistical Society,* 120: 253 – 281.

Gujarati, D. N. and Bernier, B. Basic Econometrics (2004) *McGraw-Hill Book Company, New York. Fourth Edition*

Islam Z. Backman S. and Sumelius J. 2011, Technical, Economic And Allocative Efficiency Of Microfinance Borrowers And Non-Borrowers: Evidence From Peasant Farming In Bangladesh, *European Journal of Social Sciences,* 18(3): 361 – 377.

Nghiem H. S. Coelli T. Rao P. 2006, The Efficiency Of Microfinance In Vietnam: Evidence From NGO Schemes In The North And The Central Regions, *Second International Conference on Environmental, Cultural, Economic & Social Sustainability* – 2006 Centre for Efficiency and Productivity Analysis, School of Economics, University of Queensland

Nudamatiya, A. B., Giroh D. Y., Shehu J. F., (2010) Analysis of Micro-finance Impact on Poverty Reduction in Adamawa state, Nigeria, *Journal Of Agriculture & Social Sciences,* 6(4): 91 - 95.

Oni, A. O., Adepoju, O. A. and Opawole, O. (2011) Socio Economic Characteristics, Micro-Credit and Technical Efficiency of Poultry Farmers in Lagelu Local Government Area of Oyo State, Nigeria, *African Journal of Livestock Extension,* 9:

Ray S. 2004, Data Envelopment Analysis Theory and Techniques for Economics and Operations, *West Nyack USA Cambridge University Press,* p 3.

Saleem, A. M. and Jan, A. F. (2011) The Impact of Agricultural Credit on Agricultural Productivity in Dera Ismail Khan (District) Khyber Pakhtonkhawa Pakistan, *European Journal of Business and Management,* 3(2): 1 – 8.

Shirazi and Khan (2009) in their study Role Of Pakistan Poverty Alleviation Fund's Micro Credit In Poverty Alleviation A Case Of Pakistan, *Pakistan Economic and Social Review,* 47(2): 215 - 228.

Sumelius J., Islam Z. and Sipilainen T., (2011) Access to Microfinance: Does it matter for Profit Efficiency Among Small Scale Rice Farmers in Bangladesh. 2011 *International Congress (August 30th to September 2nd) by European Association of Agricultural Economist.*

Trillo, H. F., Pagan, A. J. and Paxton, J. (2005) Start-up Capital, Microenterprises and Technical Efficiency in Mexico, *Review of Development Economics,* 9(3): 434 - 447.

Zafar, R., Afzal, A. and Khan, N. (2009) Microfinance Sector in Pakistan, *Pakistan Institute of Legislative Development and Transparency,* www.pildat.org.

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