Pakistan Economic and Social Review
Volume 49, No. 2 (Winter 2011), pp. 149-162

IMPACT OF INSTITUTIONAL CREDIT ON PRODUCTION EFFICIENCY OF FARMING SECTOR
A Case Study of District Faisalabad

SAIMA AYAZ and ZAKIR HUSSAIN*

Abstract. The paper highlighted the level of production efficiency of the farming sector in district Faisalabad in the Punjab province of Pakistan. Stochastic Frontier Analysis (SFA) technique was utilized at farm level survey data of 300 farmers for the year 2009. The overall mean efficiency score was 0.84 indicating 16 percent inefficiency of the sample farmers. The SFA estimation method also illustrated the parameters for the inefficiency. Farming experience, education, access to farming credit, herd size and number of cultivation practices showed constructive and significant effect on the farmer's technical efficiency. The variable of credit showed highest coefficient value (–0.14) indicating the importance for the agricultural credit showing that availability of credit to farmers was much more important than any other factor to improve the resource use efficiency in agriculture sector.

I. INTRODUCTION

The agricultural credit plays an important role in making farming sector more productive and efficient in developing economies and Pakistan is in exception. The shortage of credit availability or capital constraint faced by the farmers is one of the major problems in the adoption of modern technologies and efficiency improvement in the agriculture sector. The lack of resource constraints was not only the possibilities to realize opportunities for increase in productivity but also the ability to smooth consumption (Malik, 1999).

*The authors are, respectively, Lecturer in Economics and Vice-Chancellor at GC University, Faisalabad (Pakistan). For correspondence: zakir_rana@yahoo.com.

Farmers immediately need funds after the harvesting period for the next cropping season because of cash scarcity and non-payment of new crop. The modern agriculture is comprised of high-yielding seeds, fertilizers, and plant protection measures (PPM). Most of the modern inputs are purchased through cash or on credit, thus, more and more farm households depend upon credit markets. The efficient credit market provided an opportunity to the farmers in meeting consumption requirements and balanced input use, thus, resulting in betterment of the farmers (Feder *et al.*, 1990).

Easy availability and access to credit provides ability to the farmers and entrepreneurs to diversify agriculture sector by undertaking new investment or adopt new technologies. The rural credit market is comprised of formal and informal sector, playing a significant and an active role in rural economy (Adams and Fitchett, 1992; Aleem, 1990).

The formal agricultural credit institutions in Pakistan comprised of Zarai Taraqiati Bank Limited (ZTBL), Commercial Banks, Federal Bank for Cooperatives and also some non-governmental organizations (NGOs). The institutional agricultural credit was positively affecting the agricultural productivity in Pakistan (Iqbal *et al.*, 2003).

Considering the distinctive characteristics of agricultural credit, especially in developing nations, it was reasonable for the government to support rural and farming sector development. The farming sector development could be achieved by scheduling an adequate policy framework for more efficient performance of rural financial market (FAO, 1998).

A study regarding efficiency of agricultural credit in Pakistani Punjab was conducted by Sial and Carter (1996). It highlighted that the individuals who obtained average size loans produced 48 percent more output than the non-borrowers. Zuberi (1989) investigated that the impact of institutional credit comes through financing of seed and fertilizer. Whereas Qureshi and Shah (1992) analyzed that formal loans positively affect agricultural output through financing of capital investment. The authors found that financing capital investment is more beneficial than that of financing of seed and fertilizers.

The efficiency of production unit has two elements, *i.e.* technical efficiency and allocative efficiency. The former illustrates the capacity of production units to achieve maximum output level holding input level fixed. The later describes the potential of production units to use optimal input proportions for same level of output. The product of both technical and allocative efficiencies is the total economic efficiency (EE).

The purpose of this study is to investigate the impact of credit on technical efficiency of agricultural production in Pakistan. The technical efficiency estimation was carried out through Stochastic Frontier Analysis (SFA).

II. DATA AND METHODOLOGY

The purpose of this study was to develop approaches is answering the research questions; How much efficient were the farmers getting agricultural credit than the farmers not obtaining farming credit? To achieve the goals of the study, a field survey was conducted to collect primary data. A sample data of 300 rural farmers were collected from two tehsils of Faisalabad district: tehsil Faisalabad and tehsil Jaranwala. In each tehsil 150 farming households were interviewed, which were further divided into two categories, credit users and non-users of credit. The data was collected through a well-structured comprehensive questionnaire. The questionnaire was also pre-tested in the field.

For the selection of sample, lists of farmers obtaining agricultural loans were taken from Zarai Traqyati Bank Limited (ZTBL) of Faisalabad and Jaranwala branchs. The list included the required information related to the name of farmer getting loan from ZTBL, village name, amount of loan and time of taking loan. After getting list from ZTBL the villages were selected randomly from both the lists and the farmers of that village were interviewed. In case of non-availability of the listed farmers, other farmers who were obtaining loans from any other bank were interviewed as a substitution. In each village, almost equal number of borrowers and non-borrowers were interviewed. Sample of 23 villages from tehsil Jaranwala and 18 villages from tehsil Faisalabad were randomly selected for interview.

III. EFFICIENCY ANALYSIS

Generally the profit maximization is the main objective of the farmers. However, the terms efficiency achievement and maximization of profit are the two parallel things and at single farm level it should be noted, one could not achieve efficiency without profitability. The firm meanings of efficiency also involve the perfect competition in market, as efficiency could not be achieved if producers faced different prices (Ellis, 1992).

The production efficiency estimation leads to implications for both economic theory and policies. Such analysis allowed the assessment of probable increase in output together with the efficiency enhancement (Farrell, 1957).

To estimate technical efficiency, there are two commonly used approaches, the Data Envelopment Analysis (DEA) a nonparametric technique and SFA, a parametric approach. Under DEA the functional form was not specified for the production technology and it also did not included the error terms, whereas in SFA, a specified functional form was used for the efficiency estimation and the error terms were described for inefficiency measurement (Farrell, 1957; Färe *et al.*, 1990).

IV. STOCHASTIC FRONTIER ANALYSIS (SFA)

The variables for stochastic frontier production function for technical efficiency and inefficiency were described in two categories:

- Variables for frontier production function
- Variables for technical inefficiency model

Variables for Frontier Production Function

$$Y_i = f(X_1, X_2, X_3, \ldots, X_n)$$

Where

Y_i = Output

X_1 = Labour (man days)

X_2 = Fertilizer nutrients (Kg)

X_3 = Irrigation (acre inch)

X_4 = Cash inputs (Rs.)

X_5 = Expenditures on Livestock (Rs.)

Variables for Technical Inefficiency Model

$$Y_i = f(Z_1, Z_2, Z_3, \ldots, Z_n)$$

Where

Y_i = Output

Z_1 = Operated area

Z_2 = Experience

Z_3 = Education

Z_4 = Herd size

Z_5 = Total cultivation practice numbers

Z_6 = Dummy for plant protection measures (1 if using PPM, 0 otherwise)

Z_7 = Dummy for credit (1 if borrowers, 0 otherwise)

Estimation Process

Meeusen and Broeck (1977) and Aigner *et al.* (1977) proposed initially stochastic frontier production function to estimate efficiency (Coelli *et al.*, 1998). Aigner *et al.* (1977) applied this estimation technique in the analysis of the US agricultural data. By extending the model of these authors the stochastic frontier production function was specified as follows:

$$y_i = F(x_i, \beta)e^{\varepsilon_i} \qquad i = 1, 2, \ldots, N \qquad (1)$$

Where

y_i = output of the i^{th} farm

x_i = vector of inputs

β = vector of k unknown parameters

ε_i = error term

The stochastic frontier function is also entitled as 'composed error' model, as it suggests that the error term ε_i has two components:

- A stochastic random error and
- A technical inefficiency component.

The error term is as follows:

$$\varepsilon_i = v_i - u_i$$

Where

v_i = Two sided normally distributed random error with zero mean and variance σ^2, *i.e.* $N(0, \sigma_v^2)$. It incorporate the things that are away from the control of farmer (*e.g.*, weather, luck, measurement error and statistical noise)

u_i = One sided half normal distributed random variable with scale parameter σ_μ^2. It is nonnegative and shows technical inefficiency.

Aigner *et al.* (1977) parameterized the log-likelihood function for half-normal model in terms of $\sigma^2 = \sigma_\mu^2 + \sigma_v^2$ and $\lambda^2 = \sigma_\mu^2 / \sigma_v^2 \geq 0$. If $\lambda = 0$ there are no technical inefficiency effects and all deviations from the frontier are due to noise. Using this parameterization, the log-likelihood function is

$$\ln L(y \mid \beta, \sigma, \lambda) = -\frac{1}{2}\ln\left(\frac{\pi\sigma^2}{2}\right) + \sum_{i=1}^{I} \ln \Phi\left(-\frac{\varepsilon_i \lambda}{\sigma}\right) - \frac{1}{2\sigma^2}\sum_{i=1}^{I}\varepsilon_i^2 \qquad (2)$$

Where

y is a vector of log-output, $\varepsilon_i \equiv v_i - u_i$ is a composite error term, and $\Phi(x)$ is cumulative distribution function of the slandered normal random variable evaluated at x.

Under stochastic frontier, the Cobb-Douglas model when firm produce output q_i using only one input x_i takes the following form:

$$\ln q_i = \beta_0 + \beta_1 \ln x_i + v_i - u_i \qquad (3)$$

$$q_i = e^{(\beta_0 + \beta_1 \ln x_i)} \cdot e^{v_i} \cdot e^{u_i} \qquad (4)$$

Where

$e^{(\beta_0 + \beta_1 \ln x_i)}$ = Deterministic component, e^{v_i} = Statistical noise and e^{u_i} = Inefficiency (Coelli *et al.*, 1998).

The following model was specified for the estimation under SFA:

$$\ln Yi = \beta_0 + \beta_1 \ln (LAB) + \beta_2 (FERT) + \beta_3 (IRRI) + \beta_4 (\text{CINP}) + \beta_5 (LEXP) + v_i - u_i \qquad (5)$$

Where

Y_i = Total farm income (Rs. / year)

LAB_i = Annual use of labour on the i^{th} farm (man days / acre)

$FERT_i$ = Fertilizer applied on the i^{th} farm in a year (Nutrients Kg / acre)

$IRRI_i$ = Annual irrigation applied on the i^{th} farm (Acre inch / acre)

$CINP_i$ = Annual cash inputs used on the i^{th} farm (Rs. / acre)

$LEXP_i$ = Annual expenditures on livestock by the i^{th} farm (Rs. / animal)

The technical inefficiency component 'μ_i' included:

$$u_i = \delta_0 + \delta_1 (OPA) + \delta_2 (EXP) + \delta_3 (EDU) + \delta_4 (HSIZ) + \delta_5 (DCR) + \delta_6 (CPR) + \delta_7 (PPM) \quad (6)$$

Where

OPA_i = Total operated area of the i^{th} farm (acres)

EXP_i = The farming experience of the i^{th} farmer (years)

EDU_i = The level of education of the i^{th} farmer (schooling years)

$HSIZ_i$ = Herd size owned by the i^{th} farm (animal units)

DCR_i = Dummy variable for credit of the i^{th} farm (‘1’ if farm uses credit, ‘0’ otherwise)

CPR_i = Total cultural practices number of the i^{th} farm

PPM_i = Number of plant protection measures of the i^{th} farm

Results from SFA

The maximum likelihood evaluation method was utilized to estimate the parameters of stochastic frontier production function and to estimate the technical inefficiency effect. To estimate the parameters of the model, the FRONTIER 4.1 programme by Coelli *et al.* (1998) was used.

The mean value of estimated farm specific technical efficiency through SFA was 0.84, ranged through 0.49 to 0.97 (Table 1). The estimated technical efficiency scores indicated 84 percent technical efficiency of the farms in the study area. Therefore, it was possible to increase efficiency of the sample farmers by 16 percent by adopting modern technology and best farm practices.

TABLE 1

Descriptive Statistics of Technical Efficiency Scores (SFA)

Mean	0.84
Standard Deviation	0.10
Minimum	0.49
Maximum	0.97
Total observations	300

The distribution of farm specific technical efficiency obtained through SFA was presented in Table 2. Different levels of technical efficiency and percentage of borrowers and non-borrowers clearly explained that rather more percentage of borrower were at high efficiency level. The results presented in Table 2, indicated a technical efficiency range from 0.49 to 0.96 for non-borrowers and from 0.57 to 0.97 for borrowers. It was shown that none of the farmer was technically efficient in strict sense as no one had efficiency score equal to 1.

The efficiency distribution had shown that, 6 percent of non-borrower farmers while only 2.72 percent of borrowing farmers were below 60 percent level of efficiency. Table 2 also showed that 78.91 percent of borrowers are above 80 percent efficiency level while the percentage of non-borrowers was 62.

TABLE 2

Distribution of Technical Efficiency of Borrowers and non-Borrowers (SFA)

Efficiency class	Farms using credit (%)	Farms not using credit (%)
≤ 0.60	2.72	6.00
0.61-0.80	18.37	32.00
0.80-1.00	78.91	62.00
Total	150.00	150.00
Minimum	0.57	0.49
Maximum	0.97	0.96

The OLS estimation results of the Cobb-Douglas production function were presented in Table 3 and the maximum likelihood (ML) estimates of the inefficiency effect model were presented in Table 4. The statistical significance of the estimated coefficients was presented along with *t*-statistic in the Tables 3 and 4. The *t*-statistic of the coefficient of the Cobb-Douglas production function indicate that two out of 5 coefficients were statistically significant at 0.01 percent probability level; the coefficient of fertilizer nutrients and the coefficient of cash inputs were significant at 0.05 percent probability level. The model parameters were robust and parsimonious.

The economic explanation of the coefficients of production frontier was interpreted through the elasticities of inputs which also guides the production decision. Table 3 showed that all the coefficients of estimated variables had the expected positive signs which were consistent with economic theory. The coefficient of irrigation and expenditure on livestock were significant at 0.01

percent probability level. The coefficient value of irrigation indicated that a one percent increase in water availability would increase farm output by 0.342 percent. This showed that provision of irrigation facilities and availability of water would lead to enhance farming output. The results explained that an increase in expenditure on livestock would increase farmer's income by 0.067 percent. The value of estimated coefficient of fertilizer was 0.103 and was significant at 0.05 percent probability level. The cash inputs included land preparation cost and seed cost and the coefficient value was 0.139. The labour was the only parameter which was not statistically significant, and magnitude of the coefficient was very low however the sign was showing the excess labour. The observed pattern showed that labour was not a constraint in raising farming but there is a need to increase the productivity of labour. The results clearly showed that irrigation was the most important factor effecting value of farm output as it had largest coefficient value. The sum of the elasticity (0.66) indicated that the farmers in the study area were operating in the decreasing returns to scale region.

TABLE 3

OLS Estimates for Parameters of the Cobb-Douglas Production Function

Variables	Coefficients	*t*-statistic
Constant	7.812*	17.231
Labour days	0.008	0.434
Fertilizer nutrients	0.103**	2.941
Irrigation	0.342*	9.583
Cash inputs	0.139**	2.729
Expenditure on livestock	0.067*	17.386
Sum of elasticities	0.66	

*Indicates that the coefficient was significantly different from zero at 0.01 percent probability level

**Indicates that the coefficient was significantly different from zero at 0.05 percent Probability level

***Indicates that the coefficient was significantly different from zero at 0.10 percent Probability level

The estimated parameters for the inefficiency model were presented in Table 4 and suggested a number of factors that could explain the technical inefficiency. The negative sign of the estimated parameters showed positive impact on efficiency whereas positive sign indicated contributing to inefficiency. The dependent variables were inefficiency scores. The table 4 presented that only operational land holding and dummy variable of plant protection numbers had positive sign indicating negative effect on technical efficiency of the farms. The positive sign of the operational land holding explain the fact that farmers having large farm size tend to be less technical efficient but this variable was statistically insignificant. The farming experience generally thought as positively influencing the technical efficiency of the farmers since the farmers had more knowledge about their farms and farming practices. This was observed in the study area as the coefficient value of experience was –0.007 and significant at 0.10 percent probability level.

TABLE 4

Maximum Likelihood Estimates of
the Cobb Douglas Stochastic Frontier Function

Variables	Coefficients	*t*-statistic
Constant	0.554*	5.184
Operated area	0.002	0.354
Farming experience	–0.007**	–1.938
Education Year	–0.024**	–2.296
Herd size	–0.013**	–1.742
Total cultivation practice number	–0.099**	–2.176
Dummy of plant protection measures	0.187**	1.856
Dummy of credit	–0.136***	–1.748
Sigma-squared	0.069*	3.109
Gamma	0.785*	9.815

*Indicates that the coefficient was significantly different from zero at 0.01 percent probability level

**Indicates that the coefficient was significantly different from zero at 0.05 percent Probability level

***Indicates that the coefficient was significantly different from zero at 0.10 percent Probability level

The education of the farmer had coefficient value –0.024 and significant at 0.05 percent probability level which showed that education had positive and highly significant effect on technical efficiency of the farmers. This proved the argument that educated farmers were more efficient because they had better ability to visualize the correlation among input, technology and output. The results also indicated the positive and significant effect of herd size on technical efficiency of the farmer. It explained that more number of animals would certainly increase earnings of the farmer.

The results indicated that coefficient of credit dummy was –0.136 higher than all other estimated factors which are positively contributing to the technical efficiency of the farm. These results were in line with the study of Komicha (2007). It clearly explained the importance for the credit access showing that availability of credit to farmers is much more important than any other factor to improve the resource use efficiency in agriculture sector. The access to credit assures timely use of farming inputs and also provides the opportunity to the farmers to use more modern technology. The positive impact of credit on agriculture productivity was also confirmed by Sidhu *et al.* (2008), Sial and Carter (1996), Olagunju (2007), Zuberi (1989), Bashir *et al.* (2007), Fayaz *et al.* (2006) and Abedullah *et al.* (2006). The gamma value associated with the variance of the technical inefficiency effect was 0.78 and significant at 0.01 percent probability level. It indicated that effect of technical inefficiency was the key element of the total variability of output for the whole study area.

V. CONCLUSION

Due to the multifunctional nature of agriculture sector, it has a multiplier effect on nation's socio-economic and manufacturing framework and played a key role in the development of a nation. The importance of rural financial market in improving the productivity of agriculture sector was recognized in general. The provision of more adequate credit facilities enhanced and ensured timely utilization of agricultural inputs, new technologies adoption and provide an opportunity of technical efficiency achievement. For the rapid growth of agriculture sector new and modern technology adoption and increased use of better inputs were the key determinants. The need of finance to cover the farming expenditures could either be fulfilled by farmer’s own savings or through credit. In developing economies like Pakistan, savings among the small farmers are of negligible amount and agricultural credit appears as an essential input for investment in agriculture (Iqbal *et al.*, 2003).

Considering the distinctive characteristics of agricultural credit, especially in developing nations, it was reasonable for the government to support rural and farming sector development. To increase the growth and productivity of agriculture sector, the rural credit market should be developed through better and improved policy framework. According to reviewed studies, the farming credit had significantly positive effect on the efficiency of farming sector and the improved need of credit access was also confirmed here.

The purpose of this study was to provide the empirical evidences of farming sector efficiency. Another objective of the study was to suggest some policy measures to enhance and improve the efficiency of rural financial sector in Punjab, Pakistan.

The study utilized the cross-sectional survey data of 300 farming households from Faisalabad district of Punjab for the time period of 2008-2009, and estimated the farming sector efficiency. To estimate the efficiency SFA was utilized.

It was investigated that the efficiency score of total observed farming households under SFA was 0.84. The observed efficiency scores indicated that there was 16 percent inefficiency in the observed farms. It was observed that education of the farmer, farming experience, herd size, cultural practices and the dummy variable of agricultural credit was significantly and positively affecting efficiency of agriculture sector. The dummy variable of agricultural credit took the highest coefficient value indicating that credit was the most influencing factor for farming efficiency. The household size of the observed farmers, area operated, and the dummy variable for plant protection measures were all the factors negatively affecting the efficiency of framing households. The sum of estimated elasticities showed that the farmers were operating under decreasing returns to scale.

VI. RECOMMENDATIONS

The agriculture sector of Pakistan still suffers from low productivity, expensive financial support to the farmers, inefficient market structure and improper research. Thus, to develop farming sector and to increase the farming efficiency it was recommended to enhance the accessibility of small and marginal farmer to formal agricultural credit.

According to the results it was also suggested that loan for the livestock should be enhanced. Thus, by providing more credit for the purpose of livestock would definitely enhance farmer’s income and ultimately would reduce poverty.

REFERENCES

Abedullah, Shahzad Kouser, Khalid Mushtaq and Muhammad Mazhar (2006), Role of credit to enhance cotton production in Punjab, Pakistan. *Pakistan Journal of Agricultural Sciences*, Volume 43(3-4), pp. 197-205.

Adams, Dale W. and Delbert A. Fitchett (eds.) (1992), *Informal Finance in Low-Income Countries*. Boulder, Colorado: Westview Press.

Aigner, D., C. A. K. Lovell and P. Schmidt (1977), Formulation and estimation of stochastic frontier production function models. *Journal of Econometrics*, Volume 6(1), pp. 21-37. http://dx.doi.org/10.1016/0304-4076(77)90052-5

Aleem, I. (1990), Imperfect information, screening, and the costs of informal lending: A study of rural credit market in Pakistan. *The World Bank Economic Review*, Volume 4(3), pp. 329-349. http://dx.doi.org/10.1093/wber/4.3.329

Bashir, Muhammad Khalid, Zulfiqar Ahmad Gill, Sarfraz Hassan, Sultan Ali Adil and Khuda Bakhsh (2007), Impact of credit disbursed by commercial banks on the productivity of sugarcane in Faisalabad district. *Pakistan Journal of Agricultural Sciences*, Volume 44(2), pp. 361-363.

Coelli, T. J., D. S. P. Rao and G. E. Battese (1998), *An Introduction to Efficiency and Productivity Analysis*. Boston: Kluwer Academic Publishers.

Ellis, F. (1992), *Agricultural Policies in Developing Countries*, 2nd edition. Wye Studies in Agricultural and Rural Development. Cambridge University Press.

FAO (1998), *Agricultural Finance Revisited*: *Why*? Food and Agriculture Organization, No. 1.

Färe, R., S. Grosskopf and H. Lee (1990), A nonparametric approach to expenditure-constrained profit maximization. *American Journal of Agricultural Economics*, Volume 72(3), pp. 574-581. http://dx.doi.org/10.2307/1243026

Farrell, M. J. (1957), The measurement of productive efficiency. *Journal of the Royal Statistical Society* (Series A: Statistics in Society), Volume 120(3), pp. 253-290. http://www.jstor.org/stable/2343100

Fayaz, M., D. Jan, A. U. Jan and B. Hussain (2006), Effects of short term credit advanced by ZTBL for enhancement of crop productivity and income of growers. *Journal of Agricultural and Biological Science*, Volume 1(4), pp. 15-18.

Feder, G., L. J. Lau, J. Y. Lin and X. Luo (1990), The relationship between credit and productivity in Chinese agriculture: A microeconomic model of disequilibrium. *American Journal of Agricultural Economics*, Volume 72(5), pp. 1151-1157. http://dx.doi.org/10.2307/1242524

Iqbal, M., M. Ahmad and K. Abbas (2003), The impact of institutional credit on agricultural production in Pakistan. *The Pakistan Development Review*, Volume 42(4), pp. 469-485.

Komicha, H. H. (2007), Farm household economic behaviour in imperfect financial markets. Ph.D. dissertation, Swedish University of Agricultural Sciences, Uppasala.

Malik, S. J. (1999), *Poverty and Rural Credit*: *The Case of Pakistan*. Pakistan Islamabad: Institute of Development Economics.

Meeusen, W. and J. V. D. Broeck (1977), Efficiency estimation from Cobb-Douglas production functions with composed error. *International Economic Review*, Volume 18(2), pp. 435-444. http://www.jstor.org/stable/2525757

Olagunju, F. I. (2007), Impact of credit use on resource productivity of sweet potatoes farmers in Osun-State, Nigeria. *Journal of Social Sciences*, Volume 14(2), pp. 175-178.

Qureshi, S. K. and A. Shah (1992), A critical review of rural credit policy in Pakistan. *The Pakistan Development Review*, Volume 31(4), pp. 781-801.

Sial, Maqbool H. and M. R. Carter (1996), Financial market efficiency in an agrarian economy: Microeconometric analysis of the Pakistani Punjab. *The Journal of Development Studies*, Volume 32(5), pp. 771-798. http://dx.doi.org/10.1080/00220389608422439

Sidhu, R. S., K. Vatta and A. Kaur (2008), Dynamics of institutional agricultural credit and growth in Punjab: contribution and demand-supply gap. *Agricultural Economics Research Review*, Volume 21 (Conference), pp. 407-414.

Zuberi, H. A. (1989), Institutional credit and agricultural development within the framework of balanced growth. *Journal of Economic Development*, Volume 15(1), pp. 121-139.