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Institutional Credit and Agricultural Development within the Framework of Balanced Growth*

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This study based on the time-series data covering the period from 1956 to 1986, focuses on the role of institutional credit and its contribution to improvements in technology and hence, output in the agricultural sector in Pakistan. A brief explanation of the various sources of institutional credit and their relative importance is presented along with an estimation of the production function of the Cobb-Douglas type. First difference procedures are utilized in the estimation of the Cobb-Douglas production function in order to minimize the problem with multicollinearity.

This study finds that Pakistan's agricultural sector has experienced increasing returns to scale and that the country has pursued a policy of balanced economic growth between the agricultural and the industrial sectors. However, it appears that the policy makers have ignored output and the price signal when allocating credit in the agricultural sector.

I. Introduction

During the past four decades a vast literature has been published on the balanced growth approach to economic development. W. Arthur Lewis (1954) and later Fei-Ranis (1961) developed a balanced growth model in the classical tradition. In their model they considered agriculture as an industry whose development was vital for balanced growth. According to this model, agricultural surplus provides surplus labor force and it is the agricultural surplus that permits the expansion of the manufactur-

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ing sector. Fei-Ranis have shown that unless productivity of the agricultural sector is raised simultaneously to feed the larger number of industrial workers, a mere transfer of "redundant" labor (based on the assumption of zero or negative marginal productivity of labor in agricultural sector) from agriculture to the manufacturing sector will not slove the problem of under-development. They have shown that the manufacturing sector cannot continue to expand unless output in the agricultural sector also rises. It is this basic interdependence during the "take-off" process which they characterize as "balanced growth."

Jorgenson (1961) dropped the assumptions of zero marginal productivity and institutionally determined wage rates in the agricultural sector. His model, developed in the neoclassical tradition, focuses attention on three parameters, viz., (a) the rate of technical change in the agricultural sector; (b) the rate of population growth; and (c) the elasticity of output in the agricultural sector due to change in the labor force in this sector. Within the framework of this model, a rapid improvement in technology and a sharp decline in birth rate would result in economic growth and break the "vicious circle of poverty."

Kuznets (1976, p. 118) and Schultz (1964, pp. 145-147) have suggested that improvement in agricultural productivity is a prerequisite for overall economic development. Zuberi (1983) has shown that relatively higher growth rates were achieved by Pakistan when the agricultural sector performed well.

Hayami and Ruttan (1985, p. 42) have suggested that the growth rates in the agricultural sector should be consistent with growth rates in other modernizing sectors. To accomplish this, what is needed is an improvement in productivity that would result in the increase in agricultural output. The demand for credit tends to rise with the introduction of new technology. Hence, inadequate credit facilities thus can become a major bottleneck to development.

Many LDCs have, therefore, established government operated or sponsored financial institutions that provide credit on concessional rates to meet the increased credit demand. Pakistan, like many other LDCs, has been actively providing credit at concessional rates through institutional sources. It is the purpose of this paper to test whether institutional credit in Pakistan has been optimally allocated and it has contributed to improvements in technology and hence to agricultural output in Pakistan within the framework of balanced growth. Balanced growth for purposes of this paper simply means that relative prices, i.e. the percentage change in price of manufactured products and the percentage change in price of agricultural product do not differ significantly. In other words, investment in-

centives in the two sectors do not change significantly. Terms of trade are altered when price ratios in the two sectors change significantly. Balanced grwoth is, therefore, defined as an approach to development that permits an economy to maintain investment incentives in both the industrial and agricultural sectors by maintaining the stability of percentage change in prices between the two sectors. The hypothesis is that the government of a developing country, by its ability to control institutional credit, can maintain balanced growth by apportioning total investment funds, provided through specialized credit agencies or commercial banks in such a manner as to maintain investment incentives in both the industrial and agricultural sectors.

The paper is organized in the following manner. Institutional credit in the agricultural sector is discussed in Section II. Estimates of the production function and its results are reported in Section III. The balanced growth hypothesis is tested in Section IV. Summary and conclusions are presented in Section V.

II. Institutional Credit

Agriculture continues to be the single largest sector in Pakistan's economy and though its share in the gross domestic production (GDP) has declined from about 50 percent in 1955-60 (the first Five Year Plan period) to 29 percent in 1985-86, it employs 55 percent of the labor force and accounts for 77 percent of the total exports.[1] This sector has experienced an impressive increase in output averaging 4 percent per annum since the 1960s. The declared objective of the government over the years has been to achieve self-sufficiency in agricultural products through price support and subsidized inputs, including water. In the sixties, emphasis was placed on the increase in the supply of water through tube wells. Once the water supply increased it became possible to increase the use of fertilizers and new varieties of seeds. This opportunity created the need for credit.

After the departure of Hindu Bunyas, to India, the indigenous money lenders were no longer in a position to meet the credit requirements of the farmers. Therefore, the role of the government as provider of credit increased. The indigenous money lender continues to provide credit in the rural sector. Estimates about private sources of credit are not reliable as

[1] See *First Five Year Plan, 1955-60*, p. 19, and the *Sixth Five Year Plan, 1983-88*, p. 79.

no studies on the subject are available.[2] Often researchers have mistakenly equated the share of non-institutional credit in Pakistan to be the same as in India. This is an erroneous assumption, because the departure of Bunyas wiped out the age-old indebtedness of farmers, at least in Punjab, and reduced it in other parts of the country as well. This did not happen in India. Whereas the departure of the Bunya freed the farmer from old debt, it also dried up the sources to meet the credit needs of the farmers. Government sponsored financial institutions were established to fill this vacuum.

There are four institutional sources, viz., government credit or Taccavi loans, Cooperatives, the Agricultural Development Bank of Pakistan (ADBP), and the Commercial Banks which provide credit in the agricultural sector. These institutions have provided credit to farmers at concessional rates and in recent years small farmers owning 12.5 acres or less land have received interest free loans. An important effect of subsidized loans is the exaggeration of credit needs in the society. Hayami and Ruttan (1985, pp. 400-402) have suggested that subsidized loans often lead to the concentration of credit in the hands of a small number of users. Hence instead of serving the poor, farmers end up making smaller credit available to them then they would have access to if a market interest was charged. Such a policy, therefore, may result in misallocation of credit and thus increase the relative efficiency of some farmers at the expense of others. Hence the relative efficiency of large farms may turn out to be an illusion rather than a reality if public policy consistently contributed to market imperfections.

Taccavi Loans are advanced under the Government of India Land Improvements Loan Act of 1883 and the Agriculturists Loans Act of 1884. In Pakistan, these acts were replaced by the Agriculturists Loans Act, 1958. Although Taccavi loans played an important role during the years immediately following the creation of Pakistan, they are now considered primarily as relief funds and their relative importance as part of the institutional credit has substantially declined (see appendix). The fluctuations in the amount of these loans reflect the distress or relative improvements in agricultural output.[3]

2 The credit provided by the Artyas, I was told by the Director of Research at the ADBP, is largely to meet short-term needs and rarely for long-term development. Furthermore, the interest rate charged by these people is roughly 10 percent a month or 120 percent a year. People still borrow from them, because (a) they lack information about other sources of credit; (b) no security is required; and (c) timely availability of credit. I was further told that, in his judgment, private credit in the sector does not exceed 50 percent.

3 For a detailed analysis of Taccavi loans, see (Khan, 1969). Also see the *Credit Enquiry*

The *Cooperative* movement in the Indian subcontinent started with the enactment of the Cooperative Societies Act of 1904. The movement was introduced through a legislative process and had little grass root support. Even now most funds for the Cooperatives are allocated by the State Bank of Pakistan (SBP). The government over the years has made attempts to popularize Cooperatives in Pakistan; however, the increase in the Cooperative credit has largely remained a function of the government's support. In 1976, Federal Bank for Cooperatives (FBC) was established. The number of Cooperative Societies in Pakistan by 1985 reached to around 58,000, of which 45,000 are located in the agricultural sector. It is, however, estimated that roughly 2,000 of these societies are active while the rest exist largely on paper.[4]

Roughly 90 percent of the credit disbursed by the Cooperatives is in the form of production loans for purchasing the seasonal inputs, such as seed, fertilizer, pesticides, etc. The remaining loans are for medium term and are advanced toward the purchase of farm machinery. The primary emphasis is placed upon the disbursement of credit for short-term loans and assistance to small farmers (see Appendix). In Pakistan farms up to 12.5 acres are classified as small farms. In 1984-85 loans advanced to small farmers amounted to 89 percent of the total credit disbursed by the FBC. The small farmers receive short-term, interest-free loans, and whenever they pay markup for the seasonal inputs, they are reimbursed.

In order to recycle credit, great importance is attached to the recovery of loans. In 1983-84, cooperative banks recovered 37.64 percent of their outstanding loans. Around one quarter of the supply of credit through institutional sources in Pakistan now come from FBC.

The Cooperatives have reached an informal understanding with the ADBP that allows them to concentrate on short term and medium term loans whereas the later offers mostly medium and long term development funds.

The Agricultural Development Bank of Pakistan was established in 1961, as a result of the merger of Agricultural Development Finance Corporation and the Agricultural Development Bank. Over the years the bank has pursued a policy of granting loans to any person or organization

Commission Report, 1959, Aslam Ghayur and Masuda Akhtar "Study Concerning the Working of Taccavi Loans," USAID/Pakistan, "Pakistan Agricultural Inputs Loan," various *Five Year Plans,* and various *Annual Economic Surveys.*

4 For further information, see *Credit Enquiry Committee Report, 1959, first Five Year Plan, 1955-60, Financial Institutions: National and International,* 1964, various annual *Economic Surveys,* and *Annual Reports* of the FBC.

that was interested in development of agricultural products or marketing agricultural goods. Although roughly 78 percent of the total credit disbursed by the ADBP was for the medium or long-term agricultural development (Rs. 2,253.909 million out of a total of Rs 4,167.908 million in 1985 were advanced toward the purchase of tractors alone), the bank continues to provide loans toward the purchase of short-term seasonal inputs (Sen, 1983, p. 10).

In recent years ADBP has pioneered a new delivery system of credit, called The Credit and Technology Package, to the farmer at his door step. This process is carried out by a large number of ADBP employees called Mobile Credit Officers (MCOs) in the field. The ADBP employs over 1,000 such officers covering over 30,400 villages out of a total of 47,629 villages. The MCOs come in personal contact with the farmer, assess his credit needs, and advance loans.[5]

This policy has affected the agricultural credit system in Pakistan in two major ways. First, whereas only 18,782 farmers were served by the ADBP in 1972, its credit reached to 124,202 in 1985 (Agricultural Development Bank of Pakistan, 1986, p. 9). It has been reported that 88 percent of the total credit was disbursed by the MCOs. About 70 percent of the credit of ADP was disbursed among farmers holding less than 25 acres of land. Second, for a poor country like Pakistan where the annual saving rate has remained below 15 percent of the GNP, it is important to recover loans so that these funds may be made available during the next crop period or next year.[6] The credit recovery rate, which had reached a low of 35.5 percent in 1977 and was always below 50 percent until 1981, reached 89 percent in 1985 (Agricultural Development Bank of Pakistan, 1986, pp. 20-21). ADBP is the principal source of medium and long-term credit in the agricultural sector in Pakistan.

The *Commercial Banks* played virtually no role in the agricultural development of Pakistan until 1973, when the SBP assumed risk of up to 50 percent of the bona fide loss that the banks may incur from advancing agricultural loans. However, after nationalization of commercial banks in 1974, the banks have been assigned annual mandatory targets and "the shortfall in their achievement attracts penalties in the form of non-interest bearing deposits with the SBP to the extent of the shortfall" (NFC, 1983, p. 3).

5 For further information, see *Agricultural Development Bank of Pakistan* annual reports, annual *Economic Surveys* for various years, and *Agricultural Credit Indicators Series-4*, 1985.

6 Saving as a percentage of GNP was 13.3 for 1985-86. See *Economic Survey*, 1985-86, p. 24.

The government of Pakistan has made it easy for farmers to borrow funds from commercial banks. In addition to such practices as mortgaging one's land or farm implements, (a) farmers could borrow against two personal securities or against a security from commercial banks; (b) a passbook system was introduced as early as 1973. This passbook is used as the basis of land mortgage and has been helpful to small farmers in obtaining credit without serious difficulty. (NFC, 1983, p. 45).

It may also be noted that the SBP advised commercial banks to disburse seasonal loans within seven days of the receipt of passbook from the revenue officer confirming the information about the land ownership. Roughly 74 percent of the credit disbursed by the Commercial banks went to small farmers owning 12.5 acres or less land (see Appendix). In the disbursement of these loans an interesting phenomenon of proxy loaning, i.e. a situation in which the loanees themselves did not go banks to receive loans has been observed. Recipients of such loans accounted for 19 percent of receiving 21 percent amount of loans (NFC, 1983, p. 79).

The system of proxy loaning has resulted in questionable loans being disbursed. Since the commercial banks are required to meet certain targets, the proxy loaning method has come in handy to disburse loans indiscriminately.[7]

Commercial banks are the single largest provider of short-term seasonal loans through institutional sources. Roughly 72 percent of the number of loans and 62 percent of the commercial bank loan amounts were distributed among small farm owners (averaging 8 acres of land); 99 percent of the loan amount was disbursed in irrigated areas (NFC, 1983, p. 17). The magnitude of the loans in irrigated areas clearly signifies the importance of fertilizer, whose consumption has increased from 3,792,000 tons in 1971-72 to 14,837,100 tons in 1985-86. Since the objective of the government is to make seasonal inputs to the farmers, Commercial banks disburse 88 percent of the production loans in kind rather than in cash.

The pattern of institutional credit, as it emerges from data (see Appendix), shows that with the exception of ADBP loans for such items as the construction of tube wells, purchase of tractors, dairy and poultry farming, the vast majority of the credit is to finance seasonal inputs, primarily fertilizer. The Commercial Banks Survey, as well as the data from ADBP and FBC, show that as much as 75 percent of the short-term

[7] For further information about Commercial banks' participation in the agricultural sector in Pakistan, see *(Reports on Preparation of Estimates of Agricultural Credit Requirements, November, 1976), Agricultural Credit Survey* (Commercial Bank Production Loans), 1983, and annual *Economic Survey* for various years.

credit is disbursed towards the purchase of fertilizer. Even though there has been a considerable increase in the number of tractors bought by the farmers receiving loans from ADBP, their number remains relatively small. Most farmers in Pakistan continue to employ cattle to pull their plows. The success of "green revolution" is largely credited to the use of fertilizer and new varieties of seeds after the development of irrigation systems through canal water and tube wells was accomplished in the 1960s.

III. The Model

The following model patterned after the Cobb-Douglas production function was employed in estimating agricultural output in Pakistan.

$$(1) \qquad Y_t = \alpha_t \, L_t^{\beta_1} N_t^{\beta_2} K_t^{\beta_3} e^{\varepsilon_t}$$

where Y_t = output at time period t;
L_t = land cultivated in time period t;
N_t = number of labor force employed in time period t;
K_t = capital employed in time period t; and
e = stochastic disturbance.

Equation (2) is generated by taking natural logarithms of both sides,

$$(2) \qquad \log Y_t = \log \alpha_t + \beta_1 \log L_t + \beta_2 \log N_t + \beta_3 \log K_t + \varepsilon_t$$

Equation (2) can be written as:

$$(3) \qquad \hat{Y}_t = \hat{\alpha}_t + \beta_1 \hat{L}_t + \beta_2 \hat{N}_t + \beta_3 \hat{K}_t + \varepsilon_t$$

where $\hat{Y}_t$ = estimated values of log Y_t;
$\hat{L}_t$ = estimated values of log L_t;
$\hat{N}_t$ = estimated values of log N_t;
$\hat{K}_t$ = estimated values of log K_t; and
$\hat{\alpha}_t$ = estimated value of log d_t

In this model hat symbols represent the logarithms of their counterparts. It should be noted that equation (3) is a clearly linear multiple regression, and its estimates can proceed along the usual lines. In this model the exponents β_1, β_2 and β_3 indicate the output elasticities of land, labor and capital respectively. The production function in its present form simply states that agricultural output is a function of land, labor and

capital.

Official time series data, covering a period from 1961-62 to 1985-86, were used in estimating the production function. The data were converted into indices of the variables. It was relatively easy to find the data on land and labor force employed; however, it was extremely difficult to determine which inputs to include as part of capital. Once the problem of water was taken care of in the 1960s through the installation of tube wells, it became possible to use fertilizer and improved varieties of seeds. It is no coincidence that almost 75 percent of the short-term credit is disbursed for the procurement of fertilizers and 96 percent of the loans and 99 percent of the commercial bank loan amounts were disbursed among the borrowers living in irrigated areas (NFC, 1983, XXI). Official documents state that "fertilizers are the single most important source of growth of agricultural production" (Government of Pakistan, 1986, p. 55). It is in the irrigated areas that the demand for fertilizers has sharply increased. Although improved varieties of seeds have also contributed to the increase in output, data on seeds was not available for the years prior to 1972. With respect to the contribution of tractors in Pakistani agriculture, Mahmood Hasan Khan has observed that their use had almost no positive effect "on the yield" (Khan, 1985, p. 48). It was therefore decided to use fertilizer as a proxy variable for capital.

In dealing with time series data, researchers have often encountered the problem of multicollinearity (Hayami and Ruttan, 1985, p. 143-147). Early results based on raw data indicated the presence of multicollinearity. Therefore, it was decided to use standard procedures utilizing first differences. Hence, in the present study first differences are used with an objective to reduce multicollinearity by taking differences of the log of the indices. Subsequently, correlation matrices were prepared. Results indicate that the problem of multicollinearity did not exist.

The possibility of auto-correlation, however, could not be ruled out, even though the data were already differenced. Therefore, Cochran-Orcutt techniques were applied to overcome this problem. The following estimates were obtained by utilizing the ordinary least squares (OLS) method.

$$\hat{Y}_t = -0.017 + 0.89\ \hat{L}_t + 0.62\ \hat{N}_t + 0.22\ \hat{K}_t$$
$$(0.014) \quad (0.340) \quad (0.430) \quad (0.06)$$

The standard errors are reported in parentheses. The t-statistic is significant at $\alpha = 0.01$ level for land and fertilizer and at $\alpha = 0.10$ level for labor. The standard error of the regression is 0.0497, and $R^2 = 0.668$. The

F-statistic of 13.396 is significant at $\alpha = 0.001$ level. In other words, about 67 percent changes in output can be explained by knowing about the changes in the use of land, labor and fertilizer.

One of the limitations associated with the Cobb-Douglas type production function is the constant elasticities which yields for the time series data. In developing countries, these coefficients are likely to change over time. However, due to the limited number of observations, it is statistically not feasible to split the data into various time periods and compare the coefficients. It is, nevertheless, possible to plot data on agricultural output against data on labor, land and fertilizer. The data strongly suggest that agricultural production and the use of fertilizer have moved in the same direction. The correlation coefficient was 0.669 between agricultural output and fertilizer. The employment of labor force followed a similar path between 1961-62 to 1965-67. Since 1967-68 employment of labor has not followed the same path as output. Indeed the land/labor ratio has been decreasing since 1974.[8]

The results further indicate that the sum of the coefficients of L, N, and K are significantly greater than 1 and t-statistic of 16.2 is significant at $\alpha = 0.01$ level. In other words, it can be stated that the agricultural sec-

8 In order to overcome the problem with the constant elasticities over a long period of time, standard procedure was utilized by dividing the data into two equal units (each set covering a period of 12 years) and after testing each set for multicollinearity, the coefficients were compared. No multicollinearity was found. The following two equations $\hat{Y}_1$ (for the period 1962-1973), and $\hat{Y}_2$ (for the period 1974-1985) were obtained;

$$\hat{Y}_1 = -0.014 + \underset{(0.617)}{0.613\ L_t} + \underset{(0.606)}{0.846\ N_t} + \underset{(0.095)}{0.195\ K_t}$$

$$\hat{Y}_2 = 0.022 + \underset{(0.347)}{1.18\ L_t} - \underset{(1.801)}{1.84\ N_t} + \underset{(0.113)}{0.423\ K_t}$$

The standard errors are reported in partheneses. The t-values for labor and capital were significant at $\alpha = 0.10$ and $\alpha = 0.05$ level respectively for $\hat{Y}_1$, but not significant for land. The situation, however, changed for $\hat{Y}_2$. The t-values for land and capital are significant at $\alpha = 0.01$ level, but not significant for labor. The negative sign before labor in $\hat{Y}_2$ suggests that the marginal product of labor during this period was negative and the t-values indicate that changes in labor make no difference in predicting changes in agricultural output. This may, in part, be due to a steady decline in land/labor ratio between 1974 to 1985. Indeed these results support W. Arthur Lewis's assertion that the marginal product of labor may be negative in some LDCs. These results are not conclusive because the sample size is relatively small and the t-statistic for labor is not significant. The regression equation for the entire period covering this study, as reported in the text, suggests that all of the inputs used in estimating the production function are positive and t-statistics for labor are significant at $\alpha = 0.01$ level. It is, however, reasonable to infer from this study that labor, in the last decade, has become a relatively unimportant input in Pakistan's agricultural sector.

tor in Pakistan has experienced increasing returns to scale over the period covered by this study.

IV. Test

It is argued in this paper that by monitoring changes in the output of food and the ratio of percentage change in the prices of food and the percentage change in the prices of manufacturing goods, the government of Pakistan apportions agricultural credit in such a way that it conforms to a balanced growth approach to economic development. It is, therefore, hypothesized that in response to a poor harvest which causes an increase in food prices and shifts the terms of trade in favor of the agricultural sector the government through it's various financial institutions allocates more credit to the agricultural sector in order to prevent the flight of private capital from manufacturing sector to the agricultural sector. It is therefore hypothesized that credit allocation, by the government sponsored agencies, is a function of food output and the percentage change in price ratios between the index of food and manufacturing prices. The hypothesis can be formulated in terms of the following relationship:

$$(4) \qquad C_{t+1} = f(Q_f, \frac{\% \Delta P_f}{\% \Delta P_m})$$

where C_{t+1} = credit allocated for the next year in the agricultural sector; Q_f = last years food output; P_f = index of food prices, P_m = index of manufacturing products.

As linear form of the above relationship may be written as:

$$(5) \qquad C_{t+1} = \alpha_0 + \beta_1 Q_f + \beta_2 P_t + \varepsilon_t + 1$$

where $P_t = \dfrac{\% \Delta P_f}{\% \Delta P_m}$, ε_t is the disturbance term. In this equation,

$$\varepsilon_{t+1} = \rho \varepsilon_t + \mu_t + 1$$

where $\mu_t + 1$ ($t = 0, 1, 2, \ldots, n$) are normally and independently distributed with a mean zero and common variance σ^2, ρ = correlation between successive error terms, and α_0, β_1, and β_2 are the parameters and Q_t and P_t are the explanatory variables.

Institutional credit is thus a function of the indices of food output during the last time period and the percentage change in the price ratio of the food and manufacturing prices during the current time period. Although price indices for total agricultural products are available, price of food is preferred because household consumption expenditures on food constitute roughly 50.8 percent of the family budget (Government of Pakistan, 1985, p. 28).

A priori, it is expected that the sign of the coefficient of Q_f would be negative because a decline in the food crop, *ceteris paribus,* causes the price of food to rise. In order to prevent the terms of trade from shifting in favor of the agricultural sector, the government may increase the imports of food in order to keep the prices down. This would adversely affect economic growth because larger amounts of scarce foreign exchange resources have to be allocated to food imports.

Another possible effect of a decline in Q_f is an income effect, e.g., if the P_f does not rise despite a decline in food production, the income of farmers would go down. The savings generated out of a reduced income would also decline. This would mean smaller investment funds at the farmers disposal from his own resources. The government therefore fills the vacuum by increasing credit to the agricultural sector in response to a decline in output so that the private capital does not move out of the modern manufacturing sector to the traditional agricultural sector.

A priori, it can also be determined that the coefficient of P_t should be positive, i.e. if the increase in the price of food is more than the increase in the price of manufacturing products, more credit will be allocated to the agricultural sector. In order to prevent a shift in the terms of trade in favor of the agricultural sector, more credit would be allocated in the agricultural sector.

Preliminary results indicated auto-correlation. Therefore, Cochran-Orcutt techniques in the Economic Software Package (ESP) were utilized in the estimation of the model. The following equation was obtained:

$$C_{t+1} = -376.04 + 5.87Q_f - 13.94P_t$$
$$(82.57) \quad (18.71) \quad (0.414)$$

The values of the t-statistic reported in parentheses are significant at $\alpha = 0.05$ level. The $R^2 = 0.669$, and F-statistic of 26.27 is significant at $\alpha = 0.0001$ level. The obtained D-W statistic was 0.2413 which is significant at $\alpha = 0.05$ level. The sign for Q_f as well as for the P_t turned out to be different than expected. The present equation tells us that despite an in-

crease in agricultural output and improvement in the terms of trade in favor of the agricultural sector, the government of Pakistan, as a policy, continued to allocate more funds to this sector. Increased allocation of credit in the face of higher food prices accompanied by larger food output is inconsistent with the hypothsis presented in this paper. There are two possible explanations of such a phenomenon: (a) as the incomes of Pakistanis rose, they bought more food. In other words, a change in demand for food has occurred; and (b) the government may have viewed larger credit as increased subsidies to the farmers, whose productivity had declined during the last 12 years covered by this study, so that they could have greater access to modern inputs. The increased allocation of credit in this sector thus may be designed to accommodate a change in demand and growing need for credit by the farmers. This could not have occurred without the intervention by the government in the market. Since balanced growth has been defined in terms of the percentage change in the price ratios of the agricultural and manufacturing products respectively, the following procedure was utilized:

$$BG = \frac{Y_{At}-Y_{At-1}}{Y_{At-1}}(100) \Big/ \frac{Y_{Mt}-Y_{Mt-1}}{Y_{Mt-1}}(100)$$

where BG = balanced growth, Y_{At} = consumer price index of the agricultural products in time t, Y_{Mt} = Consumer price index of the manufacturing products in time t. The hypothesis was Ho: $\mu_1 = \mu_2$. For the data covering a period between 1958-59 to 1984-85, results indicate that the ratio of prices between the two sectors was 1.1001. The obtained standard deviation was 1.312, the SE (0.244) and t-statistics was –0.41 is significant at $\alpha = 0.01$ level. Hence μ_1 is not significantly different than μ_2. Therefore, it may be concluded that the country has pursued a policy balanced growth during the past 29 years.

V. Conclusions

This study shows that Pakistan has experienced a secular growth in the institutional credit over the years. Unlike the experiences of other countries, in Pakistan institutional credit has reached the small and medium size farmers. The percentage share of the small number of large farmers relative to the large number of small farmers in the total institutional credit continue to be larger. This is, however, something that is to be expected for a variety of reasons. For example, a farmer with a landholding of 12.5 acres or less is unlikely to borrow funds toward the purchase of

tractors and other farm machinery nor is he likely to have a tube well on his land. Hence he has limited demand for credit.

The primary needs of small and medium size farmers center around financing the seasonal inputs such as fertilizers, seeds and pesticides. The demand for such inputs sharply increased soon after the increase in the supply of water in 1960s. It is estimated that over 90 percent of the farms in Pakistan, are located in perennial water supply areas. It is the availability of water that has made the use of fertilizers and new varieties of seeds highly profitable.

Although ADBP continues to be a major supplier of funds and its innovative scheme of Mobile Credit Officers has enabled it to serve a much larger number of farmers in 1985 than in 1972, the largest single supplier of credit in the agriculture sector now are the commercial banks. Commercial bank credit is directed primarily to meet the short-term and medium term needs of the farmers. With pressure from the SBP to disburse seasonal loans within a record time of seven days and proxy loaning becoming widespread there have been abuses of commercial bank credit. Furthermore, since they are required to meet a set quota or sustain penalties commercial banks have engaged in fraudulent behavior. The interest of the country will be best served if this policy is reexamined by the SBF. The fixed quota and the penalty system should be eliminated.

The cooperatives in Pakistan have no grass roots movement and depend upon SBP as the principal supplier of funds to advance loans. Despite these limitations, cooperative credit during the past decade has quadrupled and is largely disbursed for purchasing seasonal inputs. Taccavi loans, although not used as production loans, continue to be an important source of relief to farmers during the period of economic distress.

An important feature of institutional credit in Pakistan lies in its emphasis on the recovery of loans. The country has achieved measurable success in this area. There seems to be an obsession with the idea to increase institutional credit to solve any problem that may arise in rural Pakistan. A disproportionately larger credit in the agricultural sector can come only at the expense of the other sectors.

The balanced growth hypothesis, examined in the present study, and the observed credit allocation to the agricultural sector are not consistent. Although the results indicate that Pakistan apparently has pursued a policy of balanced economic growth, yet the policy makers have ignored output and the price signal when allocating credit in the agricultural sector. Therefore, it may be concluded that the government is pursuing its policy of self-sufficiency in agricultural goods.

This study shows that agriculture has experienced increasing returns to scale. Therefore, consolidation of land holdings and large farm size should be considered as an option for increasing agricultural output. Large farm size would insure improvement in the productivity of labor.

In this study such important inputs as improved variety of seeds or expenditures on pesticides were not included in the model, primarily because such data are not readily available or their use did not take place until quite recently. Therefore, the readers are cautioned to consider these results as first approximation.

Appendix

COMMERCIAL BANKS
(Non-Farm Credit)

unit: Rupees-Million

Year	Small Farms 0-25 Acres	Large Farms 25 Acres or Over	Total
1979-80	13.088	142.432	155.320
1980-81	12.981	152.486	165.467
1981-82	15.730	321.046	336.774
1982-83	14.351	175.914	190.265
1983-84	122.812	130.274	253.086
1984-85	74.585	362.455	437.040

Source: Office of Agricultural Credit Sector, State Bank of Pakistan, Karachi, June 25, 1986 (unpublished data).

COMMERCIAL BANKS
(Farm Credit)

unit: Rupees-Million

Year	Subsistence Upto 12 1/2 Acres	Economic 12 1/2 Acres to 25 Acres	Above Economic over 25 Acres	Total
1979-80	780.164	468.847	183.014	1,432.025
1980-81	929.196	500.569	231.533	1,661.298
1981-82	1,422.550	469.056	208.042	2,099.648
1982-83	1,455.171	558.774	134.154	2,148.099
1983-84	2,480.603	834.347	202.736	3,517.686
1984-85	3,133.757	811.969	294.280	4,240.006

Source: Office of Agricultural Credit Sector, State Bank of Pakistan, Karachi, June 25, 1986 (unpublished data).

CREDIT DISBURSED BY ADBP

Year	Tenant farmers	Upto less than 12 acres	12 to less than 25 acres	25 acres to less than 50 acres	50 acres to less than 100 acres	100 acres and above	total
1972	10.494	7.349	9.460	20.423	18.328	13.955	80.009
1973	43.772	16.453	11.800	25.611	34.841	11.512	144.069
1974	167.200	99.840	15.580	33.570	36.050	32.460	384.700
1975	46.240	45.470	58.080	125.080	84.560	28.940	388.370
1976	54.810	46.440	49.170	206.410	128.780	47.240	532.850
1977	88.930	114.030	45.820	215.190	130.870	23.930	618.770
1978	18.940	28.500	41.270	203.250	100.160	11.410	403.530
1979	15.320	38.237	65.840	209.800	74.270	13.470	416.937
1980	41.380	73.180	151.460	222.510	95.080	24.040	607.650
1981	17.770	101.949	297.980	310.910	142.520	40.120	911.249
1982	21.150	279.006	478.940	351.300	283.650	32.910	1446.956
1983	24.635	463.741	800.478	512.299	302.903	39.619	2143.675
1984	18.551	752.779	1069.054	613.035	385.522	107.310	2946.251
1985	30.568	1209.261	1477.469	652.739	364.489	175.257	3909.783

Source: Agricultural Credit Indicators, Series-4, 1985, page 15.

Table 1

FERTILIZER OFF-TAKE AND CREDIT DISBURSED

Year	Fertilizer off-take (1,000/Tonnes)	Credit Disbursed (Rs. million)				
	Total	ADBP	Taccavi	Coopera-tives	Commercial Banks	Total
1952-53	1.00	0.08	4.20	..	.	4.28
1953-54	14.80	0.06	7.70	15.50	.	23.26
1954-55	14.10	1.10	3.80	..	.	4.90
1955-56	6.60	1.00	6.40	25.44	.	32.84
1956-57	9.00	1.70	7.10	27.75	.	32.84
1957-58	16.40	3.60	12.80	29.21	.	45.61
1958-59	18.00	5.70	17.20	32.55	.	55.15
1959-60	19.40	24.80	17.90	44.88	.	87.58
1960-61	31.40	30.90	14.80	58.08	.	103.78
1961-62	37.50	42.70	12.20	92.91	.	147.81
1962-63	40.20	40.70	9.80	82.83	.	133.33
1963-64	68.70	46.70	12.00	70.34	.	129.04
1964-65	87.20	40.50	30.50	56.54	.	127.54
1965-66	70.49	68.00	12.70	51.72	.	132.42
1966-67	111.83	100.50	11.20	83.45	.	195.15
1967-68	190.43	106.20	13.00	59.46	.	178.66
1968-69	244.64	82.10	12.20	47.38	.	141.68
1969-70	307.70	91.30	10.60	53.45	.	155.35
1970-71	283.20	92.70	10.20	55.48	.	158.38
1971-72	379.20	80.00	8.92	39.08	.	128.80
1972-73	436.20	168.80	10.23	42.02	85.70	306.75
1973-74	402.90	415.18	67.50	144.22	286.40	913.30
1974-75	425.50	395.50	12.13	81.54	520.90	1,010.07
1975-76	55.60	532.19	25.67	91.83	808.10	1,457.79
1976-77	631.80	637.93	13.14	85.43	970.00	1,716.50
1977-78	713.60	429.83	9.00	318.55	1,290.90	2,048.28
1978-79	879.80	416.39	12.76	489.16	1,381.20	2,299.51
1979-80	1,044.30	709.84	9.22	663.69	1,587.35	2,970.10
1980-81	1,079.50	1,066.20	8.59	1,097.65	1,826.77	3,999.21
1981-82	1,080.00	1,550.79	8.48	1,273.42	2,436.77	5,269.11
1982-83	1,243.60	2,297.74	11.42	1,288.95	2,338.17	5,936.28
1983-84	1,202.63	2,920.42		1,449.89	3,770.77	8,141.08
1984-85	1,253.26	4,167.90	8.00	1,596.84	4,543.10	10,315.84
1985-86 (E)	1,483.71	4,572.00	21.00	2,212.00	4,369.00	11,174.00

Source: Economic Survey, 1985-86 (statistical section) p. 40.

.. not available.

. not applicable.

E: Estimated.

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