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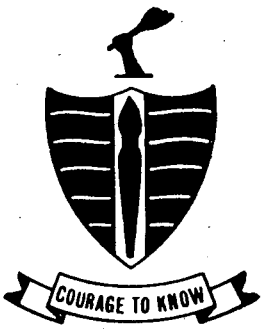

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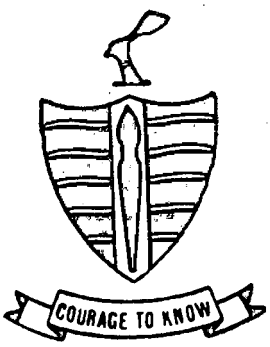

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Estimating Price Elasticity of Imports Demand in Pakistan

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A large number of elasticity estimates were made in the 30's and 40's by applying classical regression methods to inter-war annual data on prices and quantities of imports and exports, incomes and the like.

In the 1950's the methods employed earlier were subject to various criticisms. Objections to time-series analysis in international trade were first set out systematically in an influential paper by Orcutt.[1] His theme was that there were various sources of bias in the usual method which tended to lead to too low an estimate of the price elasticity ; the relatively low estimates found by earlier investigators need not therefore be taken too seriously.

One of the objections was that the existing statistical estimates have been based on relating the volume of current imports (yearly averages) to current prices (yearly averages). If part of the quantity adjustment to a price change comes in the two or three or more years following the price change, then since current years are compared, not only will explanation be inadequate but the apparent effect of price changes on quantity will be less than the true long-run effect. The demand for imports depends upon the supply schedules of domestic competitors as well as on the demand schedule of consumers. It follows from this that long-run price elasticities of imports and exports are probably substantially larger than short-run price elasticities.

Orcutt has explained the bias and error due to neglect of lagged prices in the following way. Let us suppose that :

$$Q_t = A + B_1 P_t + B_t P_{t-1} + B_3 P_{t-3} \quad — \quad 1$$

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where Q_t represents the quantity of imports, at time t, adjusted for the influence of all variables except P_t' P_{t-1}' and P_{t-2}' represents the relative import price at time t. Then if the price remains constant for three or more priods, we have :

$$Q_t = A + (B_1 + B_2 + B_3) P_t = A + BP_t \quad — \quad 2$$

were $B = (B_1 + B_2 + B_3)$ is the coefficient relating Q to P, allowing sufficient time for a full adjustment of quantity to price, If the effect of P_{t-1} and P_{t-2} is neglected, then we may write

$$Q_t = A + B_1 P_t + E_t \quad — \quad 3$$

Where $E_t = (B_2 P_{t-1} + B_3 P_{t-3})$ — 4

And thus represents the omitted part of the demand relation. Expressing the deviation of each variable from the sample mean by a small, rather than a capital letter, we may write equation 3 as

$$q_t = b. p_t + e_t \quad — \quad 5$$

Multiplying through by p_t and summing over the sample, we obtain.

$$\Sigma q_t p_t = B_1 \Sigma p_t^2 + \Sigma p_t e_t \quad — \quad 6$$

The normal equation giving the least squares estimates of B_1, denoted by b_1 is

$$\Sigma q_t q_t = b_1 p_t^2 \quad — \quad 7$$

Subtracting equation 7 from equation 6 we obtained

$$(B_1 - b_1) \Sigma p_t^2 + \Sigma p_t e_t = 0 \quad — \quad 8$$

$$\text{or } (B_1 - b_1) = - \Sigma p_t \frac{(B_2 P_{t-1} + B_3 P_{t-3})}{\Sigma p_t^2} \quad — \quad 9$$

Since $B = B_1 + B_2 + B_3$ we may rewrite equation 9 as :

$$b_1 = B_1 + B_2 \left(\frac{\Sigma P_t P_{t-1}}{\Sigma p_t^2} - 1 \right) + B_3 \left(\frac{\Sigma p_t p_{t-2}}{\Sigma p_t^2} - 1 \right) - - 10$$

From equation 10 it can be seen that b_1 will in general be biased toward zero. This follows since B_2 and B_3 are presumeably negative and the two quantities in brackets are also negative. $\frac{\Sigma p_t p_{t-1}}{\Sigma p_t^2}$ is very nearly equal to the correlation of p_t with p_{t-1} and likewise $\frac{\Sigma p_t p_{t-2}}{\Sigma p_t^2}$ is very nearly equal to the correlation of p_t with p_{t-1}.

By definition they cannot exceed one for infinite series and can only exceed one by very small amounts for short series. In practice they are almost certainly well below one for any choice of price variable that has been made. If these autocorrelations of the price series were negative then b_1 compared with B_1 would be biased thoward zero by an amount greater than the obsolute value of (B_2+B_3). If the price series were random in time, then the bias towards zero would be equal to the absolue value (B_2+B_3). And if the price series is positively autocorrelated, then the bias towards zero would be greater than zero but less than the absolute value of (B_2+B_3) 2.

The aim of the present paper is to test the hypothesis that long-run price elasticity is greater than short run price elasticity. We use distributed lags given by Almon[3] in the specification of the demand relation. The specific form of the import relation used to get long-run price elasticity is :

$$M_t = a+\beta_o \overset{*}{P}_t + \beta_1 \overset{*}{P}_{t-1} + \beta_2 \overset{*}{P}_{t-2} + \gamma Y + \theta R \qquad — \qquad 11$$

Where M is the value of imports divided by the price index of imports. $\overset{*}{P}$ is the relative price calculated as

$$\frac{(\textit{Unit value index of imports})\ (\textit{Effective exchange rate})}{(\text{GDP deflator})\ (\text{Official exchange rate})}.$$

Y is GDP at market prices. R is foreign exchange reserves held and controlled by StateBank of Pakistan.

The choice of variables in the estimation of the import demand functions has been dictated by theory and availability of the data. Theoretically it is expected that imports would move positively with

the changes in the gross domestic product, and negatively with the changes in relative prices. However, in Pakistan, commerical policies are pursued to restrict imports. Since stringency of commercial policy is not quantifiably observable, following Kemal & Alvie,[4] foreign exchange reserve are used as a proxy variable.

For the estimation, we employed a second degree polynomial and a three period lag. The β system is :

$$\beta_o = \lambda_o$$
$$\beta_1 = \lambda_o + \lambda_1 + \lambda_2$$
$$\beta_2 = \lambda_o + 2\lambda_1 + \lambda_2$$

Now the function(11) ignoring Y and R and given that $\sum_{i=o}^{2} \lambda_1 = 1$

$$M_t = \alpha + \lambda_o \overset{*}{P}_t + (\lambda_o + \lambda_1 + \lambda_2) \overset{*}{P}_{t-1} + (\lambda_o + 2\lambda_1 + 4\lambda_2) \overset{*}{P}_{t\ 2}$$

$$= \alpha + \lambda_o (\overset{*}{P}_t + \overset{*}{P}_{t-1} + \overset{*}{P}_{t-2}) + \lambda_1 (\overset{*}{P}_{t-1} + 2 \overset{*}{P}_{t-2}) + \lambda_2 (\overset{*}{P}_{t-1} + 4 \overset{*}{P}_{t-2})$$

$$= \alpha + A_1 \sum_{i=t}^{t-2} \lambda_i \overset{*}{P}_i = \alpha + A_1 \overset{*,}{P}_t$$

Doing these computations for all t's for which there are data, we performed the regression

$$M_t = \alpha + \gamma Y + \theta R + A_1 \overset{*,}{P}_t$$

$$= 25.77 + \underset{(4.45)}{6.67}\ Y - \underset{(0.54)}{5.482}\ R - \underset{(1.9)}{7.33}\ \overset{*,}{P}_t$$

$$R_2 = 0{,}93, \qquad F = 38.45, \qquad D.W. = 1.46$$

It may be observed that GDP and the relative prices are significant[5] explanatory variables in explaning variations in the total imports. The proxy variable is insingificant. The price elasticity is calculated as

$$e = A_1 \frac{\bar{\overset{*,}{P}}_t}{\bar{M}_t} = 0.46$$

which is quite low despite the fact that it is a long-run elasticity.

For the short-run elasticity, we have estimated an other demand function with no lagged variable

$$M_t = \alpha + \gamma Y + \theta R + \beta P_t^*$$

$$= 1.91 + \underset{(4.93)}{6.79}\, Y + \underset{(0.23)}{2.61}\, R - \underset{(1.88)}{76.05}\, P_t^*$$

$$R^2 = 0.93, \qquad F = 45.89, \qquad D.W. = 1.25$$

Here again GDP and the relative prices are significant explanatory variables. The short-run price elasticity is

$$e = \beta \frac{\bar{P}_t^*}{\bar{M}} = 0\ 44.$$

Hence the sample data rejects the hypothesis that long-run elasticity is higher than short-run elasticity.

Conclusion

The paper was an attempt to test Orcutt's contention that a change in price affects the demand with a lag, especially with regard to imports. The elasticity calculated does not differ much. The long run elasticity is 0.46 while the short run elasticity is 0.44. The model fits well as shown by the coefficient of determination which stands at 0.93. The Durrin-Watson statistics show that there is not much heteroscedasticity. Hence we disprove the contention of an elastic import demand for Pakistan and elasticity pessimism that still prevails. For this a time-series data for 15 year (1971-72 to 1985-86) was used. The t-statistic shows that G.D.P and the relative prices are significant explanatory variables.

APPENDIX I

Data Problems :

Theoretically we want to relate the changes in the imports to changes in prices and income. Data on physical quantity of imports

cannot be aggregated while value data is product of quantity and prices and changes in value overtime misrepresent the changes in quantity. Thus to remove the effect of price changes, value of imports is deflated by per unit value index of imports. In Economic Survey (1986-87), Unit value indices are available on (1975-76=100) only from 1976-77 onwards, while for 1971-72 to 1975-76 they are taken from Economic Survey (1984-85).

Effective exchange rates for imports were taken from an unpublished study by Dr. A.R. Kamal, Joint Economic Adviser, Ministry of Finance, Government of Pakistan. Official Exchange Rates is available in Economic Survey (1986-87). Data on GDP deflator is available in Economic Survey (1986-86) with (1959-60=100). As the unit value index is in (1975-76=100). GDP deflator was converted into (1975-76=100) through splicing method. Data on official reserves is also available in Economic Survey 1985-86.

APPENDIX II

Period	Value of Imports at Current Prices (Rupees Million)	Unit Value Indices of Imports (1975-76=100)	Effective Exchange Rate	GDP Deflator (1975-76=100
(1)	(2)	(3)	(4)	(5)
1971—72	3495	26.8	9.04	51.18
1972—73	8398	49.0	16.57	59.14
1973—74	13479	70.8	15.34	73.18
1974—75	20925	105.5	14.27	89.30
1975—76	20467	100.0	14.37	100.00
1976—77	23012	107.7	15.11	110.43
1977—78	27815	117.4	15.57	120.48
1978—79	36929	122.0	15.56	124.45
1979—80	46929	149.3	15.55	139.82
1980—81	53844	181.5	16.56	154.52
1981—82	59482	200.7	17.68	169.00
1982—83	68151	217.6	21.42	178.75
1983—84	76707	229.2	22.72	195.63
1984—85	89778	247.4	23.90	207.51
1985—86	90946	242.8	25.01	217.86

Source : (a) For column (2) P.E.S. (1986—87).
(b) For column (3) P.E.S (1984—84) & (1986—87).
(c) For column (4) Unpublished study by Dr. A.R. Kamal.
(d) For column (5) P.E.S. (1986—87).

APPENDIX III

Data on Variables

Year	Total Imports	GDP in (Ml. Rs)	Foreign Reserves in (Ml. Rs)	Relative Prices
1971—72	130.4	36747	3138	0.99
1972—73	171.4	39155	4584	1.25
1973—74	190.4	41238	3985	1.34
1974—75	198.3	42570	4813	1.51
1975—76	204.7	44531	6085	9.27
1976—77	213.7	46223	4266	1.29
1977—78	236.9	49947	10003	1.32
1978—79	298.3	52375	8956	1.31
1979—80	314.3	56961	19992	1.42
1980—81	295.0	60941	18472	1.65
1981—82	296.4	64709	17477	1.76
1982—83	313.2	68871	35952	2.19
1983—84	334.7	72540	34534	2.18
1984—85	362.9	78329	19006	2.43
1985—86	374.6	84217	27570	2.45

Source : Pakistan Economic Survey, 1984—86 & 1986-87.

APPENDIX IV

Computer Printout for

$M_t = \alpha + \gamma y + \theta R + \beta p_t$

The Regression Function is

1.911232
6.793475E−03 × 1
2.610632E−04 × 2
−76.05574 × 3

The Anova Table for the Regression is

Source of Variation	SS	DF	MS
Regression	72273.35	3	24091.12
Error	5773.659	11	524.8781
Total	78047	14	

F Value for the Whole
Regression with 3 and 11 DF = 45.8985
Residual Variance = 524.8781
Standard Error of Estimate = 22.91022
T Value of B_o = 5.761871 E−02
ST. Err of B_o = 33.17034
F Value of B_o = 3.319916 E−03
T Value of B_1 = 4.932599
ST. Err of B_1 = 1.377261 E−03
F Value of B_1 = 24.33054
T Value of B_2 = .2395783
ST. Err of B_2 = 1.089678 E−03
F Value of B_2 = 5.739778 E−02
T Value of B_3 = −1.887397
ST. Err of B_3 = 40.27664
F Value of B_3 = 3.562266
R Square = .9260234
R Square Adjusted for Degrees of Freedom = .9058479
Multiple Correlation Goefficient= .9623011

Case No.	Y Observed	Y Estimated	Residual
1	130.4	177.0751	−46.67508
2	171.4	174.0368	− 2.63678
3	190.4	181.1862	9.213806
4	198.3	177.5218	20.77824
3	204.7	209.4292	− 4.729233
6	213.7	218.9278	− 5.227799
7	236.9	243.4428	− 6.542755
8	298.3	260.4245	37.87549
9	314.3	286.0944	28.20563
10	295	295.2428	− .2427673
11	296.4	312.2174	−15.8147
12	313.2	312.6083	.5917053
13	334.7	337.9237	− 3.223908
14	362.9	354.1837	8.716309
15	374.6	394.8983	−20.29825

Durbing Watson Statistic = 1.256149
Ess = 5773.659

APPENDIX V

Computer Printout for $M_t = \alpha + \gamma Y\ \theta R + A_1 P_t'$

The Regression Function is

25.7773
6.670542 E—03 × 1
—5.489717 E—04 × 2
—7.533518 × 3

The Anova Table for the Regression is

Source of Variation	SS	DF	MS
Regression	45030.85	3	15010.28
Error	3513.47	9	399.3855
Total	48544.32	12	

F Value for the Whole
Regression With 3 and 9 DF = 38.4499
Residual Variance = 390.3855
Standard Error of Estimate = 19.75818
T Value of B_o = .7930616
ST. Err of B_o = 32.50353
F Value of B_o = .6289468
T Value of B_1 = 4.457371
ST. Err of B_1 = 1.496519 E—03
F Value of B_1 = 19.86816
T Value of B_2 = — .5421221
ST. Err of B_2 = 1.012635 E—03
F Value of B_2 = .2938964
T Value of B_3 = —1.96855
ST. Err of B_3 = 3.826937
F Value of B_3 = 3.87519
R Souare = .92276234
R Souare Adjusted For Degrees of Freedom = .9034979

Multiple Correlation Coefficient =.9631321

Case No.	Y Observed	Y Estimated	Residual
1	190.4	208.1166	—17.71658
2	198.3	200.1995	— 1.89946
3	204.7	235.1239	— .423935
4	213.7	213.7176	— 1.763916 E—02
5	236.9	247.3876	—10.48758
6	298.3	262.5011	35.79895
7	314.3	284.849	29.45099
8	295	306.5067	—11.50668
9	296.4	320.3599	—23.95993
10	313.2	320.126	— 6.925995
11	334.7	329.9596	4.840393
12	362.9	352.6665	10.23346
13	374.6	381.9678	— 7.367829

Durbin Watson Statistic = 1.464362

Ess = 3513.47

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5. t-Statistic is reported in parenthesis.

Determinants of Fertility : A Microeconomic Approach

DR. ABDUL RAUF BUTT*

This paper attempts to identify the factors which affect fertility of a couple. To this end, the paper is organized in the following fashion. Section I introduces the theme of the paper. Theoretical and methodological frameworks are presented in Section II and III, respectively. Section IV presents the empirical results of regression analysis. Finally, conclusions and suggestions are presented in Section V.

1. Introduction

The Less Developed Countries (LDCs) are making strong efforts to raise the standard of living of their people. Their Governments are endeavouring to improve the quality of life of their citizens through various long-term development plans and short-term policies.

If we focus our attention on Pakistan, it has launched development plans for the last thirty-five years. Inspite of achieving reasonable rates of economic growth, per capita income and/or standard of living of population could not be raised to a reasonable level. One may enquire : what is the underlying problem ? If economic history of Pakisran is traced it will be found that economic growth rates and population growth rates are going side by side. The impact of development plans on economic growth is nullified by high population growth rates.[1] Therefore, it is concluded that population growth is the major obstacle in raising the standard of living of Pakistani population. This phenomenon calls for a systematic and thorough study of population growth in Pakistan.

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Population growth of a country depends on three factors :

(1) fertility (birth rates) ; (2) mortality (death rates) and (3) migration.

In the present attempt, migration effect on population growth is not subject of interest. Therefore, assuming a constant migration, population growth rate is simply the difference between fertility and mortality rates. During the last two decades, mortality rate has declined considerably in Pakistan because of improved health care, technology and medicines. On the other hand, fertility rates remained unchanged. This indicates that fertility has contributed the most in population growth in Pakistan. Government of Pakistan launched various fertility control programmes, but none could achieve the desired objectives.[2] Fertility depends on socio-economic and biological factors which must be examined properly. One of the objectives of this paper is to identify these factors quantitatively. This is done by estimating a microeconomic-based regression model of demand for children.

2. Theoretical Farmework

As demand for children by a couple indicates fertility of the couple, therefore, fertility can be studied in the context of traditional demand theory of Economics.[3] The demand theory is based on the theory of consumer behaviour. As demand for ith commodity by jth individual (Q_{ij}) depends on (i) its own price (P_i), (ii) purchasing power (or income) of the consuming unit, Y_j, (iii) prices of related goods, P_r, and (iv) tastes of the consuming unit, T_j, etc. the demand function can be specified as : $Q_{ij} = f(P_i, Y_j, P_r, T_j)$. A demand for children function can be specified on the same lines.

It seems appropriate here to list the possible factors which affect the demand for children, or in other words fertility. These factors are (i) level of income of the household, (ii) education of wife, (iii) child bearing age after marriage, (iv) major source of income of the household, and (v) education of husband.

A rationale for using each of the above variables in the regression model is presented below.

As income of individual (or household) increases he/she can afford more children. But the evidence seems to show that parents with higher income tend to substitute child quality for quantity. They invest in fewer and more educated children. The earning capacity of these children is expected to be quite high. Hence, it can be argued that high income parents tend to demand fewer children than low income parents. This could be because status effect of increased income raises the relative desire for material goods, especially for medium income families whose budget constraints previously precluded the purchase of these goods. In other words, additional children beyond a socially accepted or minimum desired number may be inferior goods.[4] Shultz (1974) has found empirically an inverse relationship between fertility and the level of income.

A rationable for using education of wife, as a proxy variable for opportunity cost of raising children is given below. More educated females have better opportunity for employment and other activities outside their homes. As there is a positive correlation between level of education and income, the earnings foregone of these educated mothers to bring up children are substantial. Therefore, for highly educated mothers, the opportunity cost of raising a child is relatively very high. This opportunity cost can be used as a proxy for price for having a child. It has also been found that better employment opportunity for females outside their homes and greater female school attendence, especially at the primary and early years of secondary schooling, are associated with lower level of fertility.[5] Hence, female education is expected to affect fertility inversely.

Child bearing age after marriage, being a biological factor, is related with the number of children born. A rationale for this is very straightforward. As the child bearing age after marriage is relatively long, there are chances for having more children. Hence, child bearing age after marriage is expected to affect fertility directly.

Need for children also depends on the major source of income of the head of the household. If the head of the household is self-employed rather than a wage earner, more children will be

helpful in income earning activities Therefore, self-employed persons are expected to demand more children. Hence, self-employment and fertility are expected to be directly correlated.

Education of husband reflects taste factors in the demand for children model. The educated persons appreciate the utility of education more than their uneducated counterparts. More educated fathers wish to see their children highly educated and are expected to substitute child quality for quantity. A famous study by Simon (1974) has recognized that more educated people like to have fewer children than their less educated counterparts of the same economic conditions, Hence, the demand for children or fertility is expected to be inversely related with the level of husband's education.

There can be certain other factors which might affect fertility but they are omitted because they are either difficult to be quantified or the information about them is not available.[6] This means the model used here will not provide R^2 as big as it could if all the explanatory variables are included. A few of the omitted variables are discussed below.

To carry the Family Name : The demand for at least one son per couple is deeply rooted in our value system, and will remain latent in the fertility behaviour in our region.

Social Security for Parents ; It is an established fact that in developing countries most of the parents depend on their children to support them in their old age. For most of the families immediate cost of raising children is minimal compared to their need for support in their old age. Thus, children seem to be the best possible annuity- For women, the compulsion is even greater because they do look to children for support in old age, sickness, divorce, separation, illness and widowhood as compared to men.

The other omitted determinants of fertility include : differential between desired and actual no of sons, differential between desired and actual no of daughters, etc.

3. Methodological Framework

Traditional methods of multiple linear regression have been used to identify the factors which can serve as determinants of fertiliity. To compare the relative importance of various use of standardized regression coefficient is made. The cross-section data on all variables for the year 1978 were taken from a survey conducted by the Social Sciences Research Centre, University of the Punjab, Lahore under the title of "Lahore Fertility Survey".

The Statistical Model : Equation (1) forms a basic part of the model for the present study.

$$Y = f(X_2, X_3, X_4, X_5, X_6) \quad . \quad (1)$$

where Y denotes demand for children (no, of alive children born to a couple since their first marriage), X_2 denotes level of income (monthly income of the households from all sources), X_3 denotes education of wife (educational level of respondent (wife), measured in terms of years of schooling), X_4 denotes child bearing age after marriage, Y_5 denotes the major source of income, (The whole sample was classified in terms of profession as (i) wage earners and (ii) self-employed and dummy variable is used as :

$$X_5 = \begin{cases} 1 \text{ if the source of income is self-employment} \\ 0 \text{ Otherwise} \end{cases}$$

and X_6 denotes education of husband (educational level of husband measured in terms of years of schooling).

For the purpose of estimation and verification, the following functional form of (1) is assumed :

$$Y = b_1 + \sum_{i=2}^{6} b_i X_i + U \quad \ldots(2)$$

In Equation (2) 'U' denotes the error or disturbance term and it indicates the effect of omitted variables. It is also assumed that Equation (2) satisfies all the assumptions of a Classical or Ordinary

Least Squares (OLS). Therefore, Equation (2) is estimated by OLS and its empirical results are presented below.

4. Empirical Results and their Analysis

Empirical results of the paper have been presented in the following table, hereafter referred to as the Regression Table.

REGRESSION TABLE

Regression Coefficients, Standard Errors, t-Ratios and other Empirical Results

	Level of Income	Education of Wife	Child Bearing Age after Marriage	Major Source of Income	Education of Husband
Regression Coefficient	.0074	—0.0525	.1509	.0800	—.0022
Standard Error	.0049	.0245	.7504	.7515	.0848
t-Ratio	1.5192	2. 141	2. 011	.1064	—.0260
Standardized Regression Coefficient	0.2315	—0.0045	0.0162	.1875	.0894

Intercept = 0.0380, R^2 = 0.84286 and F = 47.21028

The Regression Table indicates that the value of R^2 is 0.84 which is statistically significant at 5 percent level of significance as F-statistic is 47.21. This means 84 percent of the variation in the dependent variable (fertility) is explained by the explanatory variables used in the model. This indicates the present model has an excellent explanatory power. Nevertheless, the variation which remained unexplained by the present model can be minimized by incorporating other important variables and/or by experimenting with other functional forms of the model.

Now empirical results presented in the Regression Table are analyzed taking each of the independent variables in turn.

Level of Income : The value of regression coefficient associated with the level of income is 0.007 as indicated in the Regression Table. This regression coefficient is statistically significant at 10 percent level of significance ; but being positive, is contrary to *a priori* expectations. Possible reasons for having a positive coefficient of income variable are that our sample contains low income households and level of income may not be an important variable in this study, or there may be little variation in the levels of income among households included in the sample, or at low income levels a positive relationship between income and fertility is more appropriate.

Education of Wife : The regression coefficient associated with education of wife is -0.052 with a t-statistic of -2.141 as indicated in the Regression Table. This coefficient is statistically significant at 5 percent level of significance and is also consistent with *a prior* expectations. Hence education of wife affects fertility of a couple inversely.

Child Bearing Age After Marriage ; The regression coefficient associated with variable, child bearing age after marriage, is 0.151 with a t-statistic of 2.011 as indicated in the Regression Table. This coefficient is consistent with *a priori* expectation as the coefficient is positive and is statistically significant at 5 percent level of significance. Hence, child bearing age after marriage and fertility are directly related.

Major Source of Income : It is expected that self-employment, a major source of income, is directly related with fertility. As the coefficient associated with the major source of income is 0.080 as indicated in the Regression Table, it is consistent with *a priori* expectations. However, the coefficient is statistically insignificant. This may be one of the consequences of suspected multicollinearity (R^2 is very high, whereas, t-ratios are very low.).

Education of Husband : The sign of the coefficient associated with the variable is consistent with *a priori* expectations, but its

value is statistically insignificant, which again could be due to collinearity between major source of income and eduation of husband. To confirm this, simple correlation between major sourc of income and education of husband was computed and found out to be statisticaly highly significant. This means the values of t-statistics of the regression coefficients associated with major source of Income and education of husband are superficially reduced to the exten there is a multicollinearity problem.

Relative importance of Explanatory Variables: The relative importance of explanatory variables is determined by computing the Standardized Regression Coefficients and comparing their absolute magnitudes.

As indicated in the Regression Table, the standardized regression coefficient associated with the level of income has the highest value (0.2315). This means, level of income is the most important determinant of fertility.

The variable, child bearing age after marriage of female, ranks second in importance as is evident from the Regression Table. (The standardized regression coefficient of this variable is 0.1875), the variable, education of wife, used as a proxy for opportunity cost of raising a child, stands third in relative importance in the model, as its standardized regression coefficient is 0.0894 Major source of income which reflects the need factors for demand for children stands fourth in relative importance in the present model. Its standardized regression coefficient has a value of 0.0162. The least important variable included in the present model of fertility is education of husband. This variable reflects the taste factors. The standardised regression coefficient of this variable, being 0.0045, is of the minimum value.

5. Conclusions and Suggestions

Conclusions: The following conclusions emerge from the empirical results of this study. The determinants of fertility can be identified by estimating a demand model for children based on microeconomic approach, as used above. An exercise done in this

study to estimate and verify the demand for children like the demand for other goods and services has proved to be very useful. The factors which have proved to be important determinants of fertility are listed below in order of their relative importance :

(i) Level of household income, (ii) child bearing age after marriage, (iii) education of wife, (iv) major source of income, and (v) education of husband.

Suggestions : The present study can be improved upon by working in the following directions.

(i) Only the linear functional form of the model was tested in the present study. Experiments with non-linear functional forms of the model may provide more interesting results.

(ii) Multicollinearity is suspected because of small size of the sample. Therefore, multicollinearity problem can be avoided by using a sufficient large sample.

(iii) It has been indicated above that the present model explained 84 percent of the variation. The remaining unexplained variation of 16 percent is due to omitted variables. Efforts can be made to include omitted variables to enhance the amount of explained variation.

Notes :

1. Since, GNP per capita rate of growth is equal to GNP growth rate minus population growth rate, then given the GNP growth rate a positive population growth rate implies a lower GNP per capita growth rate. And lower GNP per capita growth rate means lower rate of improvement of the standard of living.

2. For evaluation of Family Planning in Pakistan, see Robinson (1978) pp. 235—247.

3. See Gould and Fergusan (1980), pp. 56—58. One may argue that demand for children does not reflect fertility for

infertile couples. This is true, but in case of all fertile couples demand for children does reflect their fertility. Since fertile couples are very common and infertile couples are very rare, therefore, it can be generalised that fertility and demand for children are highly correlated.

4. These arguments have been given by Ogawa (1978), pp. 431—450.

5. Todaro (1981) has mentioned this result without any reference. See Todaro (1981), p. 192.

6. To examine the consequences of omitted variables, see Pindyck and Rubinfeld (1981), pp. 128—131.

7. There are two approaches of computing standardised regression coefficients. First, if b_j is an ordinary regression coefficient associated with jth explanatory variable, then the standardised regression coefficient associated with this variable is defined as the product of b and Sx_j/S_y, where Sx_j and S_y denote the standard deviation of jth explanatory variable and the dependent variable, respectively. Second, the original variable is standardized first as : $X_j—\bar{X}_j/Sx_j$ where X_j denotes the jth explanatory variable. $\bar{X}$ and Sx_j denote the mean and standard deviation respectively, of the jth explanatory variable. Then the regression equation is estimated using the standardised variables and the estimated coefficients obtained from this equation are called as the standardised regression coefficients. Since the statistical significance of the standardized regression coefficient is the same as that of the ordinary regression coefficient and R^2 is also unaffected and to avoid running additional regression using standardized data, the first method of the computing the standardised regression coefficients has been adopted in this study. For more on standardised regression coefficient (Beta coefficients), see Pindyck and Rubinfeld, (1981) pp. 90—91.

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Farm Size Structure and Agricultural Productivity*

A Case Study of Baluchistan (Pakistan)

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Introduction

There is a substantial body of theoretical and empirical literature on the relationship between farm size and agricultural productivity.[1] A survey of literature on farm size indicates that both large and small farms are more efficient than medium farms.[2] In Pakistan, some studies based on small districts level samples concluded that large farms are relatively more efficient in productivity than small farms. For example, Mahmood and Haque (1981) concluded that large farms had higher value added output than small and medium farms. Some other studies also led to a similar conclusion, which have been discussed in the next section. These empirical studies on Pakistan's agriculture seem to indicate that large farms are more productive than other size farms. In the light of these views, we are interested to investigate whether these results hold at aggregate level. Thus, we expect that a province which dominates in large farms is expected to experience rapid increase in the agricultural productivity. If we were to find that a province with vast area under large farms experiences rapid agricultural growth as compared to other provinces, we would hypothesize that the farm size differential among the provinces tends to account for the rapid agricultural

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growth in that province. Of course, there might be other offsetting tendencies which could affect this pattern.[3] However, the large size of the farms alone could be expected to provide a systematic growth in agricultural productivity.

In this study our major focus will be on the province of Baluchistan. There is very little research on the agricultural sector in this province. This is one of the most underdeveloped province of Pakistan. There is hardly any data available on the agricultural sector. Before 1971 Baluchistan was a part of one unit, West Pakistan. Thus, regional data was not maintained. We attempt to bring some information into literature regarding the sources of agricultural growth in Baluchistan. Generally, in the literature, Baluchistan is considered inefficient in production. This study is the first to point out the efficiency of the agricultural sector in Baluchistan.

To investigate the above mentioned hypothesis, we have organized this study as follows :—Part one is an introduction ; part two provides the theoretical basis and a general literature review ; part three is an empirical analysis, and part four is the conclusion of the study.

Part Two

Theoretical Background

Farm Size and Agricultural Productivity

The importance of farm size in influencing or determining agricultural productivity has been the major focus of much debate and research in recent years. Generally, small and large farms are considered relatively more efficient in productivity than medium farms.[4] However, the efficiency of the farms differs from country to country.[5] Farm efficiency also depends upon the ecological potential and the ability of the farmers. Presently in Brazil, Columbia and Philippines, it has been found that small farms make better use of their available land than large farms. On the other hand, large farms produce higher level of output pet unit of labour.[6] In Pakistan, Mahmood and Haque (1981) found that, in ten districts,

the value of output was much greater in case of large farms as compared to small and medium ones.

In Pakistan, it is a general view that large farms make better use of modern inputs. These farms also have better access to modern technology, which increases agricultural productivity. The small farms have surplus labour which also increases agricultural productivity. It is thus contended on this basis that farm size productivity curve is U-shaped [Shahida, 1981]. In other words, small and large farms are more productive than medium size farms. The basic reason for this, according to Haque and Mahmood, is that small farms had the advantage of utilizing surplus labour resources cheaply and intensively and large farms were able to increase agricultural productivity by utilizing modern technology such as tractors. Medium farms, on the other hand, lacked both the resources of labour and capital to be as productive as smaller or larger farms.

Between small and large farms, research findings are divided, on the one hand, on the efficacy of small farms to make more efficient use of land and, on the other hand, on the ability of large farms to utilize large scale machinery and reduce the cost of labour management. Some studies show that small farms benefit equally from modern technology as large farms. According to Surjit Sidhu, the adoption of modern wheat varieties in the Indian Punjab showed a neutral technological change with respect to farm size. Both small and large farms achieved approximately equal gains in efficiency.[7] He concludes that "(1) small and large wheat producing farms have equal relative economic efficiency and equal relative price efficiency and (2) ..... tractor-operated and non-tractor operated wheat producing farms have equal relative economic efficiency and equal relative price efficiency. This implies that these farms also have equal technical efficiency."

K.M. Azam makes a similar point in interpreting data from the Pakistani Punjab : "(Although) the small farmers do face relatively more severe constraints of irrigation water and credit, the difference in the severity of these constraints is not serious enough to have

caused any significant differences in the yields obtained by the small farmers as compared with large farmers."

Other studies have shown that large farms are superior to small farms with respect to agricultural production. Mahmood Khan, in his article "Farm Size and Land Productivity Relationship in Pakistan"[8], suggests the following reasons for the superiority of large farms :

> Firstly, large farms are more efficient than small farms in that they have greater output per acre and there are increasing returns to scale.
>
> Secondly, the per acre use of the "non-traditional" inputs like fertilizer, hired labour and farm machinery is greater on large farms.
>
> Thirdly, there is some evidence that the use of capital inputs on large farms and their relatively favourable access to credit have been encouraged by public policy.

In general, the superiority of large farms appears to turn on their ability to utilize more efficient modern technology. Nagy and Salam (1981) in their study, found that the farms that used modern technology as compared to farms that did not, were able to show that farms employing modern technology were more productive. In examining small farms that used a comparatively high level of modern technology, Salam (1981), in his study of farm inputs and farm productivity for different farm categories in the Punjab, showed that large farms, using a similar level of modern technology, produced higher yields of wheat per acre.

The above mentioned debate has been fuelled by the discovery of high yield variety (HYV) seeds, sometimes called modern varieties (MV), whose introduction has often been heralded as the green revolution. This debate now centers round the kind of farm structure most suited to the cultivation of these seeds, and the adoption of other modern inputs such as fertilizers and machinery, while preventing the emergence of negative externalities such as an inequitable income distribution. However, focus of our study is the analysis

of dynamic growth of agricultural productivity in different categories of farm size structure.

It has generally been the case that policy makers and government officials in developing countries, not to mention officials in national and international assistance agencies, have been skeptical about the efficiency of small farms and have favoured the development of large farm structures. On reason for this may be that as a country develops, the opportunity cost of labor rises and the special efficiency advantage of small farms largely disappears (Hayami and Ruttan, 1985, P. 341). For Baluchistan, which combines large areas of uncultivated land with small areas of high population densities, future growth would depend on the ability to transform its unused land into large farm areas that would take advantage of modern technology and neutralize the relative labor scarcity or diffusion of modern technology to fill the gap of labor shortage. My studies (1986) & (1988), showed that the increase in population in Baluchistan is a source of rapid growth of its agricultural productivity.

The above mentioned literature indicates that large farms seem to be more dynamic in increasing agricultural productivity than other farms. Based on these theoretical and other evidences, now we turn to analyze the farm size structure in Pakistan, in general, and in Baluchistan, in particular.

Part Three
Emphirical Findings

Farm Size

The farm structure is mainly divided into three categories ; small, medium and large. Small farms are defined as those encompassing areas up to 7.5 hectares, medium farms as those having area greater than 7.5 hectares but not exceeding 20 hectares ; and, large farms as those encompassing areas greater than 20 hectares.[9]

The data on farm size is available for 1960 and 1980. The data for 1960 will provide a picture of farm size structure before the Green Revolution, which began in Pakistan in the mid 1960s. The

analysis of the data for 1980 will reflect the changes that occured during the 1960s and 1970s.

We have analyzed the farm size structure in three ways : First, by calculating the percentage number of farms under each size ; second, by calculating the percentage of farm area under each farm size, and third, by confirming the results of the second by calculating the percentage of cultivated area under each farm size.

Percentage Number of Farms by size and province

Table 1 indicates that Baluchistan had the highest percentage number of large farms as compared to all other provinces, in both 1960 and 1980. Baluchistan and Sind dominated in the percentage number of large farms. However, in Baluchistan and Punjab these farms increased by 1%, between 1960 and 1980. In the same period Sind lost 2% of its large farms and NWFP maintained a constant percentage number of large farms between 1960 and 1980.

Table 1

Percentage Number of Farms by Region in 1960 and 1980

Province/Farm Size	Punjab	Sind	NWFP	Baluchistan	Pakistan
1960					
Small	79	64	86	74	77
Medium	20	32	12	20	21
Large	1	4	2	6	2
1980					
Small	72	76	87	64	74
Medium	26	22	11	29	23
Large	2	2	2	7	3

Source : Calculated from *Pakistan Census of Agriculture*, 1980 and 1960, Vol. II, West Pakistan.

Table 1 also indicates that in 1960 Baluchistan had the lowest percentage of small farms among all the provinces, except Sind, and in Pakistan as a whole. In 1980, in Baluchistan, the percentage number of small farms significantly decreased. During this period, it had the lowest percentage number of small farms compared to other provinces. In Baluchistan, the percentage number of small farms decreased from 74% to 64% between 1960 and 1980.

Between 1960 and 1980 there was also a decrease in the percentage number of small farms in other provinces. The percentage number of small farms decreased by 7% in Punjab and by 3% in Pakistan as a whole. It should be noted, however, that the same increased in Sind and NWFP. The percentage number of small farms increased by 12% in Sind and 1% in NWFP. The above discussion of the percentage changes in the small farms seems to suggest that there was a significant decrease in these farms in Baluchistan and Punjab. However, there was an increase in the same in Sind.

In 1960, Baluchistan had 20% medium farms. It increased to 29% in 1980. In the same period, the same increased from 20% to 26% in Punjab and from 21% to 23% in Pakistan as a whole.[10] However, the percentage number of medium farms decreased in Sind from 32% to 22% ; and in NWFP, from 12% to 11%. It indicates that the percentage number of medium farms increased in Punjab and Baluchistan. However, the same significantly decreased in Sind and there was a minor change in NWFP,

Farm Area by Size and Region

Table 2 shows that Baluchistan possessed the largest percentage of farm area under large farms in 1960 and 1980. In 1960, Baluchistan had 54% of its farm area under large farms. Baluchistan led in the percentage of large farm area by 38%, 31% and 11% than the provinces of Punjab, Sind and NWFP, respectively. During the same period. it also exceeded the national average in the percentage of area under large farms by 31%. In 1980, 46% of its farm area was under large farms. This indicates that between 1960 and 1980

Table 2

Percentage of Farm Area by Region
(1960 and 1980)

Region/Farm Size	Punjab	Sind	NWFP	Baluchistan	Pakistan
				(Percentage of the total area)	
1960					
Small	33	30	32	16	32
Medium	51	47	32	30	45
Large	16	23	36	54	23
1980					
Small	33	41	41	19	34
Medium	46	40	30	35	43
Large	21	19	29	46	24

Source : Calculated from *Pakistan Census of Agriculture*, 1980 and 1960.

there was a decrease of 80% in the area under large farms in Baluchistan. However, it continued to dominate other provinces in the percentage area under large farms in 1980. In 1980, the area under large farms in Baluchistan exceeded by 25%, 27% and 17% than that of Punjab, Sind, and NWFP, respectively. During the same period, it also had 22% greater farm area under large farms than that of Pakistan as a whole. The above figures indicate that Baluchistan far exceeded other provinces in the percentage of farm area under large farms, as compared to other provinces. It also dominated all other provinces in the percentage area under large farms.

Table 1 shows that, in Baluchistan, the percentage number of small farms decreased from 75% to 68% between 1960 and 1980. On the other hand Table 2 indicates that the percentage area of the small farms increased from 16% to 19% during the same period. These results may not be misunderstood. This paradox is a result of the relative percentage loss and gain in the number of farms and the percentage farm area. In absolute numbers, the small number of farms increased from 122,300 to 138,286 between 1960 and 1980.

This constitutes an increase of 15,986 new, small farms. The increase in the medium plus large farms was 21,801 during the same period. Thus, it indicates that the relatively greater increase in the medium plus large farms led their percentage share of the number of farms to increase as compared to small farms. Similar reasoning explains the increase in the percentage area of small farms. It is also possible that the size of the small farms might have been increased, which could lead to an increase in the percentage area of small farms. Over time, new area has also been brought under cultivation. Due to these reasons, this paradox may not be seen contradictory, *i.e.* the decrease in the percentage number of small farms and the increase in the percentage area of small farms.

In Pakistan, since 1960, the percentage of land under each farm category was significantly altered. The percentage of total farm area under medium farms decreased in all provinces except Baluchistan. They decreased by 5%, 7% and 6% in Punjab, Sind and NWFP, respectively. Baluchistan increased the total farm area under medium farms by 5%, and the same decreased by 2% at the national level.

Betweed 1960 and 1980, the percentage area under small farms increased in all the provinces except Punjab, where it decreased by 4%. These figures increased by 11%, 9% and 3% in Sind, NWFP and Baluchistan, respectively. However, the percentage of small farm area increased only by 2% at the national level. These figures indicate that although there was a small change in the area under small farms at the national level, there was a significant change in the same at regional level. In other words, the farm area under small farms increased significantly during this period.

To confirm our findings, we have also calculated the percentage cultivated area under each farm size, since farm productivity is directly related to cultivated area. The following discussion concerns the size of cultivated area.[11]

Cultivated Farm area by Size and Region

Table 3, shows that Baluchistan dominated all other provinces in the percentage of cultivated area under large farms, in 1960 and

1980. It had 53% of its area under large farms in 1960, which exceeded by 43%, 37% and 36% the cultivated area under large farms in Punjab, Sind and NWFP respectively. It also had 38% greater cultivated farm area under large farms than the national average. It should be noted that the regional differences in the cultivated area are greater than the regional disparity in farm area under large farms (Table 2). However, it again provides a support to our findings of farm area in Baluchistan. It indicate that Baluchistan also had larger percentage of cropped area under large farms.

In 1960, Baluchistan had the lowest percentage of cultivated area under medium farms *i.e.* 32 percentage. Baluchistan had 18%, 20% and 5% less cultivated area under medium farms than that of Punjab, Sind, NWFP, respectively. Baluchistan also had a relatively less percentage of cultivated land under medium farms than the national average of percent. In Pakistan, as a whole, there was 17% more cultivated farm area under medium farms than that of Baluchistan.

In 1980, Baluchistan continued to dominate all other provinces, in the percentage of cultivated area under large farms. It had 39%

Table 3
Percentage of Cultivated Area by Farm Size
(1960 and 1980)

Region/Farm Size	Punjab	Sind	NWFP	Baluchistan	Pakistan
			(Percentage of the total area)		
1960					
Small	40	40	46	15	36
Medium	50	52	37	32	49
Large	10	16	17	53	15
1980					
Small	36	47	50	22	39
Medium	46	39	32	39	42
Large	18	14	18	39	19

Source : Calculated from *Pakistan Census of Agriculture*, 1960 and 1980.

of its cultivated area under large farms in 1980. Baluchistan exceeded the percentage of cultivated area under large farms by more than double that of Punjab, Sind and NWFP, respectively. There was 19% of the cultivated land under large farms at the national level in 1980. Thus, Baluchistan also exceeded the national average by 20 percent. These empirical findings support our conclusion that Baluchistan had a significatly greater percentage of its cultivated area under large farms, as compared to other provinces and Pakistan, as a whole.

Table 3 also indicates that in 1980 Baluchistan had the minimum percentage of cultivated area under small farms, as compared to other provinces. It had only 22% of its cultivated area under small farms, which was 14% less than Punjab's, 23% less than Sind's and 28% less than the cultivated area under small farms in NWFP. In the same period, it also had 17% less cultivated area under small farms than that of the national average. This indicates that Baluchistan had a lower percentage of cultivated area under inefficient...small farms, in 1980.

To summarize our findings from Table 1, 2 and 3, we draw the following results. Baluchistan had a different farm structure than that of other provinces. The analysis of the percentage number of farms by size...small, medium and large...(Table 1), indicates that Baluchistan had the highest percentage number of large farms. It also had the minimum percentage number of medium farms in 1960, as compared to the other provinces except NWFP. These findings are consistent with the results obtained from the analysis of area under farms. Baluchistan also ranks at the top in cultivated and farm area under large farms. It dominated with regard to the area under these farms in all the provinces and Pakistan, as a whole. Baluchistan also had the lowest percentage of farm and cultivated area under small farms-inefficient farms.

Now, we turn to analyze the changes in the agricultural productivity in Baluchistan and in the other regions to see whether the theoretical findings and empirical findings regarding the large farms is consistent with the agricultural growth. Our analysis of the agricultural productivity relates to the period from 1960 to 1980,

Agricultural Production and Productivity.

Percentage Change in Agricultural Productivity

Table 4, shows the percentage changes in the aggregate per hectare production of all crops in the four provinces and in Pakistan between 1960/61 and 1979/80. To provide a more accurate picture of the relative importance of the crops, the production figures have been weighted according to the total area allocated to the crops in each of the provinces and then the table have been calculated.

Table 4

Percentage Changes in the Agricultural Productivity

Region/Year	1960/61—1971/72	1971/72—1979/80
Punjab	35.94	20.24
Sind	118.35	27.33
NWFP	37.55	—1.99
Baluchistan	137.53	80.73
Pakistan	52.53	24.27

Source : Calculated from *Agricultural Statistics of Pakistan*, 1971/72, 1979 & 1983.

Table 4 indicates that Baluchistan had the highest percentage increase in per hectare agricultural output as compared to all other provinces of Pakistan between 1960/61 to 1979/80. In the 1960s, the national increase in the aggregate per hectare production of agricultural output was 52.53%. During the same period, it increased by 137.53% in Baluchistan. The comparable figures for Punjab, Sind and NWFP were 35.94%, 118.35%, respectively. Baluchistan's percentage increase in the agricultural output was approximately 3.8 times greater than Punjab, 1.2 times greater than that of Sind's and 3.7 times greater than that of NWFP's. Compared to the national level, the increase in Baluchistan's agricultural productivity exceeded by 2.6 times.

These figures indicate that Baluchistan dominated the other provinces in the percentage increase in the per hectare productivity in the 1960s. It also had the greater increase in agricultural productivity than that of the national average, as a whole.

In the 1970s, the percentage increase in the per hectare production of agricultural output for Pakistan was lower than that in the 1960s, although it increased in percentage terms in all the provinces except NWFP. NWFP experienced a decrease in the agricultural output by 1.99% while the same increased by 24% in Pakistan, as a whole. It increased by 80.72% and 20.24% in Baluchistan and Punjab, respectively. Then again, the percentage increase in the per hectare production of Baluchistan was much larger than the increase in all other provinces. The percentage increase in the per hectare production of agricultural output in Baluchistan was approximately 4.0 times greater than that of Punjab, 2.96 times greater than that of Sind and more than 80 times that of NWFP. In conclusion, Table 4 indicates that Baluchistan had the highest percentage increase in the per hectare production of agricultural output among all the provinces between 1960/61 to 1979/80.

Levels of Production

The following is a summary of the regional levels of agricultural production of the major crops in Pakistan for 1960/61 and 1980/81, followed by a closer examination of the percentage changes in the per hectare production in the four provinces.[12]

The major crops in Pakistan are wheat, rice, Bajara (millet), maize, jowar and barley. Cotton is not discussed in this section, since it is not grown in all the provinces. These crops are grown in over sixty percent of the total cultivated land in Pakistan. More importantly, they, with the exception of jowar, represent more than ninety percent of all the cereal crops cultivated in Pakistan. Wheat and rice are Pakistan's food crops. Rice is also a major cash (export) crop.

In 1960/61, the average per hectare production of wheat in Pakistan was 822 kilograms. Among the provinces, the level of per

hectare production of wheat was 471 kg. in Baluchistan, 869 kg. in Punjab, 767 kg. in Sind, and 572 kg. in NWFP. In 1980/81, the average per hectare production level in Pakistan had increased to 1516 kg. In the same year, the per hectare levels of production in Baluchistan, Punjab, Sind and NWFP were 1472 kg, 1541 kg, 2009 kg., and 1183 kg, respectively. Thus, the percentage increase in the per hectare production of wheat between 1960/61 and 1980/81 was 90% in Pakistan, 312% in Baluchistan, 77% in Punjab, 163% in Sind and 100% in NWFP. This indicates that Baluchistan's per hectare percentage increase in the production of wheat was 4.0 times greater than that in Punjab, 1.93 times greater than Sind's and 2.94 times greater than NWFP's. It was also 3.45 times greater than the percentage increase in the per hectare production of wheat in Pakistan. This clearly indicates a significant superiority of Baluchistan over other provinces in the percentage increase of per hectare production of wheat.

We have also calculated the weighted average production of wheat in all the provinces. The weighted average production of wheat in Pakistan, as a whole, was 329 kg. in 1960/61. It increased to 634 kg. in 1979/80, which constitutes an increase of 93 percent. The figures for the same were 396 kg, 195 kg, 259 kg and 237 kg. in Punjab, Sind, NWFP and Baluchistan, respectively, in 1960/61. The figures for the same in 1979/80 were 686 kg., 456 kg, 579 kg. and 624 kg, respectively. It constitutes an increase of 73%, 134%, 124% and 163%, respectively. Thus Baluchistan again ranks at the top, in all the provinces, in the percentage increase of agricultural productivity. Thus, the superiority of Baluchistan, in the dynamic analysis, in increasing agricultural productivity is confirmed by both techniques *i.e.* growth of per hectare production and aggregate weighted average increase in agricultural productivity.

In rice, the level of per hectare production increased by 98% between 1960/61 and 1980/81 in Pakistan, and by 378%, 47%, 153% and 96% per hectare in Baluchistan, Punjab, Sind and NWFP, respectively. Thus, in percentage terms, the increase in per hectare production of rice in Baluchistan was 8.1 times greater than Punjab, 2.47 times greater than Sind, and 3.94 times greater than NWFP.

It was also 3.86 times greater in the per heetare production of rice (percentage terms) than the average level of increase in Pakistan. Thus, Baluchistan again clearly dominated the other provinces in the percentage increase in per hectare production of riee. It also had the highest level of per hectare production, as compared to other provinces. The average per hectare level of rice production rose from 878 kg. to 1730 kg. in Pakistan, from 656 kg. to 3173 kg. in Baluchistan, from 906 kg. to 1333 kg. in Punjab, from 860 kg. to 2177 kg. in Sind, and from 813 kg. to 1597 kg, in NWFP.

The per hectare levels of production of bajra, maize, jowar and barley generally did not increase all over Pakistan between 1960/61 and 1980/81, but it did increase most significantly in Baluchistan. In 1960/61 the average levels of production of bajra, maize, jowar and barley in Pakistan were 388 kg., 915 kg., 460 kg., and 647 kg. per hectare, respectively. In Baluchistan they were 417 kg., 333 kg., and 296 kg. per hectare, respectively, while in Punjab they were 462 kg., 869 kg., 398 kg., and 684 kg. per hectare, respectively. The comparable figures for Sind were 296 kg. for bajra, 527 kg. for maize, 582 kg. for jowar, and 675 kg. for barely, while for NWFP they were 518 kg. for bajra, 898 kg. for maize, 555 kg. for jowar and 592 kg. for barley.

The figures for 1981/89 show that in Pakistan the average per hectare production levels of bajra, maize, jowar and barley were 1259 kg. (an increase of 225% from 1960/61 to 1981/82), 487 kg. (a decrease of 47%), 572 kg. (an increase of 24%), and 711 kg. (an increase of 10%), respectively. In Baluchistan, bajra, maize, jowar and barley all increased in per hectare production from 1960/61 to 1981/82. The per hectare production of bajra in Baluchistan for 1981/82 was 833 kg. (an increase of 35%), jowar was 593 kg. (an increase of 78%), and barley was 714 kg. (an increase of 14%). In Punjab, the figures for the above four crops were 1247 kg. (170%), 538 kg. (a decrease of 40%), 546 kg. (37%), and 672 kg. (a decrease of 2%). In Sind, the figures were 548 kg. (85%), 424 kg. (a decrease of 20%), 638 kg. (10%), and 535 kg. for barley (a decrease of 21%), and in NWFP, the figures for the same were 1307 kg. for bajra (152% increase), 434 kg. for maize (a decrease of 57%), 48 kg. for

jowar (a decrease of 12%), and 829 kg. for barley (an increase of 40%).

Baluchistan was the only province whose per hectare productivity in the six crops[13] increased without exception, between 1960/61 and 1981/82. In all other provinces the per hectare productivity (in percentage terms) decreased in at least one crop. Moreover, the increase in the agricultural productivity occurred at a significantly higher rate in Baluchistan than all other provinces.

Baluchistan did not only have the significant percentage increase in the productivity of major crops, but also had the highest per hectare production of onions, potatoes and tobacco, as compared to other provinces.[14] The above discussion of the changes in productivity leads us to conclude that Baluchistan was more successful than other provinces in the growth of agricultural productivity.

The above discussion of the dynamic agricultural productivity growth seems to coincide with the farm size structure in Baluchistan. Baluchistan having the larger farms area was expected to perform rapid increase in its agricultural output. The empirical analysis of the agricultural productivity supports the notion that the province which dominated in large farms and farm area also achieved the highest increase in the agricultural productivity. The empirical analysis was carried out by different techniques and all the results supported our hypothesis and were also found consistent.

Conclusion

An empirical survey of the literature on the theories of agricultural productivity and farm size efficiency (part two) indicated that large farms more efficient than small and medium farms. In Pakistan, districts level sample studies also conlcuded that large farms have higher value added output than that of other's. Based on these rationales, we were interested to study whether these views also hold for dynamic aggregate increase in agricultural productivity. The analysis of the farm size structure and agricultural productivity was carried out to confirm these findings at the aggregate level. The

analysis of the farm size structure indicated that Baluchistan ranked at the top in all the provinces in having the large farms and large farm area (in percentage term). It also had the minimum percentage area under small farms.

Our analysis of the changes in the agricultural productivity indicated that Baluchistan dominated all other provinces in the percentage increase in agricultural productivity. Baluchistan not only had the highest increase in the agricultural productivity, but it also achieved the highest level of per hectare production of many crops as compared to other provinces. All other provinces had a lower percentage increase in the agricultural productivity than that of Baluchistan. It also dominated in the growth of agricultural productivity in Pakistan, as a whole.

The above mentioned empirical findings of the farm size structure and the increase in agricultural productivity seem consistent to the theories of agricultural productivity. The empirical evidence supports our hypothesis that large farms size structure seems a source of rapid increase in the agricultural productivity. However, there may be other factors which also contribute to increase agricultural productivity of large farms but the farm size alone can significantly influence the growth of agricultural productivity. We also concluded that our study confirms the findings of other studies which concluded similar results at micro level, based on districts samples in Pakistan. Our study also points out the patterns of regional agricultural growth and farm size structure, that it differs among the provinces in Pakistan. The identification of these patterns may be useful to formulate agricultural policy in Pakistan. It is a general view that only Punjab and Sind were the most efficient in agricultural productivity.[15] However, our study indicates that Baluchistan had the highest percentage increase in the agricultural productivity since 1960. Furthermore, it seems that large farm size structure is a source of rapid agricultural growth in Baluchistan.

Notes :

1. See Hayami and Ruttan (1985), Berry and Cline (1979) and Haque and Mahmood (1981).

2. See Wizarat, Shahida (1981), Salam (1981) and Khan (1983) & (1981).

3. I have analyzed the other possible variables which may have increased agricultural productivity in Baluchistan. The variables which were found significant were population growth and technical change, not technological changes. Thus, any other possible variable which could have increased productivity seems farm size structure, as theory predicted. The efficiency in Baluchistan may also be a result of farm size structure. See for details, Aslam Chaudhary (1986) & (1988).

4. See Haque and Mahmood (1981) and above.

5. A farm of two hectares in wheat growing areas of Sastratchawn is a small farm. A farm of twenty hectares in rice growing areas in Jawa is very large farm. Thus, the farm size, large or small, depends upon the location and other enviroment. In Pakistan, where mix of modern technology and old methods exist, our definition of farm size is optimal. See also. Christopher and Gerrard (1983), for farm size distribution and rationale.

6. See Berry and Cline (1979). They argued that small farms are efficient, as compared to other size farms.

7. See : Surjit Siddhu (1974), p. 742-51.

8. See Khan (1979), p. 151-90.

9. We also utilized farm size definition as follows. Small farms up to 12.5 acres, Medium farms greater than 12.5 acres but less than or equal to 25 acres and large farms greater than 25 acres. We still reached the same conclusion as mentioned in this study.

10. The public agricultural policies in Pakistan discourage large farms. Several reforms have been implemented to reduce farm size.

However, the objectives of the policies were also to achieve food self-sufficiency and agricultural adequacy. These seems inconsistant policies, according to our findings. If these goals have to be achieved then the efficient farm structure need to be encourged, See M. H. Khan (1979).

11. Cultivated area is the land which is cropped in the current season. It directly contributes to agricultural productivity. However the farm area consists of both cropped and fallow land.

12. The data cited in this section is taken from *Agricultural Statistics of Pakitan*, 1979 & 1983.

13. The six crops are ; Wheat, Rice, Bajara, Maize, Jowar and Barley.

14. This was in 1980/81. For more details see *Agricultural Stattstics of Pakistan*, 1979 & 1983.

15. In Pakistan large farms were discouraged. Land reforms were introduced for this purpose. See M. A. Khan (1981), P, 125-183, Land reform, Ahmed 1959. Our study shows that if the goal in agriculture is to accelerate agriculture, than, these policies may not be appropriate, large farm size structure may be successful in increasing agricultural productivity but it may also generate income inequality. Thus, there may be trade off between growth and income distribution. If such considerations are important then complemontary policies may also be necessary to address these issues.

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Growth of Rural Small Industries in Pakistan

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1. Introduction

Rural small industries seetor now occupies special place in the economic plans of the developing countries. The case for rural small industries is built on the argument that these : (1) require small capital ; (2) offer proportionately greater employment opportunities ; (3) discourage rural—urban migration ; (4) encourage rural entrepreneurship ; and (5) require limited organizational ability. Since the developing countries are faced with the serious problems of capital shortage, high unemployment levels, increasing trend of rural-urban migration, excessive dependence on on-farm activities and limited organizational ability to initiate large-scale industries, the rural small-scale industries (RSIP) seem to offer an attractive alternative to large-Scale industries for countries like Pakistan.

2. The Pakistani Background

2.1 The significance of rural small industries for Pakistan can be judged from the presence of 1,84,611 such units in the country in 1983-84. These industrial enterprises employed 3,89,993 rural workers, including women, and produced a wide range of consumer and producer goods (SHMI, 1987, P.X).

Also despite their relatively small share in total manufacturing investment, small-scale sector employs 80% of the manufacturing employment. (7th Plan ; P. 261). This evidence lends further weight to the case for a vigorous and planned development of small-scale sector in Pakistan. This thinking is reflected in the 7th Plan (1988-93) which highlights the need to shift the focus of manpower planning to the small-scale sector, particularly in the rural areas, for creation of additional jobs.

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2.2 Present Structure

Despite adverse policies, RSIP is a sizeable and dynamic sector of Pakistan's economy. The official neglect of this sector is evident from the fact that a national census of rural small industries has not been taken so far. The main source of information is the Survey of Small and Household Industries (SSMI) of 1983-84.

According to the 1983-84 Survey of Small and Household Manufacturing Industries, there existed an estimated total of 184, 611 such units in Pakistan. Out of these, 104, 673 (56.7%) were household manufacturing units, while the remaining 79,938 (43.3%) were small manufacturing units.

Province-wise distribution of these units shows presence of 77.1% of the total in the Punjab, 14.2% in N.W.F.P, 8.2% in Sind and 0.5% in Baluchistan. (Table 1).

TABLE 1

Province—Wise Distribution of Rural Small and Household Manufacturing Industries : 1983-84

Province	Household Units	Small Establishments	Total	Percentage
Punjab	87,741	54,558	142,299	77.1
Sind	6,432	8,640	15,072	8.2
NWFP	10,360	15,900	26,260	14.2
Baluchistan	140	840	980	0.5
Pakistan	104,673	79,938	184,611	100.00

Source: SHMI : 1983-84 (Rural), Page X, Federal Bureau of Statistics, Islamabad, 1987.

In terms of number of units, wheat milling was most important, followed by wooden carpets, hand and edge tools and leather footwear. Put together, these categories accounted for 56% of all household and small manufacturing units in the rural areas.

The data show inter-provincial variations in the density of these units on population basis. For every 10,000 rural dwellers, there were less than 3 manufacturing units in Baluchistan, about 13 in Sind, 26 in N.W.F.P. and approximately 39 in the Punjab.

There are two broad types of RSIP : a predominantly male section, clustering in small towns and at cross-roads ; and a predominantly female section, fragmented on the smallest imaginable scale within the rural cottages. Both types are highly commercialised The female sector is almost entirely dependent on subcontracting. The male sector produces on its own account for local customers, or for urban markets. In employment terms, 389, 993 workers were engaged in these units in the country : the average number of workers per unit were 2.1. Moreover, there were employment differences across industries. Depending on the nature of technology and scale of production, the average number of employees were highest in mineral products and lowest in cotton textile handlooms, hand tools and leather footwear. While in terms of total employment, largest number of workers were engaged in woollen carpets, followed by wheat milling, cane crushing and others. (Table 2).

TABLE 2

Employment Distribution by Industries in the Rural Small Manufacturing Units in Pakistan[1]

Industry	No. of Units	Persons Engaged No.	%	Average Units Size
1. Woollen Carpets	28,672	70,163	18.0	2.4
2. Wheat and Milling	31,253	52,260	13.4	1.7
3. Gur (Cane)	6,142	35,436	9.1	5.8
4. Hand and edge tools	22,225	30,652	7.9	1.4
5. Leather footwear	21,060	29,694	7.6	1.4
6. Bricks and Tiles	2,663	20,593	5.3	7.7
7. Other mineral products	1,713	16,316	4.2	9.5
8. Cotton textile handloom	10,455	14,797	3.8	1.4
9. Wooden furniture	6,468	11,005	2.8	1.7
10. Earthenware	5,897	10,762	2.7	1.8
11. All other industries	48,063	98,315	25.2	2.0
Total	184,611	389,993	100.00	2.1

Note : 1. According to SHMI (1987), the persons engaged in RSIP constituted three quarters of total employment in rural small industries.

Source : SHMI, 1987, P. XI.

The RSIP produce a wide range of consumer and non-consumer goods. The activities of these units are spread over 108 different industries as classified under the Pakistan Standard Industrial Classification (PSIC). The major products include wheat products, gur (raw sugar), cotton textile, woollen carpets, hand tools, leather goods, bricks, wooden furniture and mineral products.

Besides regular production, the small units also produce on subcontracting basis for other manufacturing firms. Similarly, in some cases, a part of the total production work of a firm is subcontracted to other firms. Most of the subcontracting work is concentrated in a few industries viz., woollen carpets, hand and edge tools, wheat milling, sand and planing, and cotton weaving.

2.3. Policy and Institutional Framework.

The development of rural small industries in Pakistan (RSIP) has been influenced by: (i) the overall development policy ; (ii) the industrial strategy ; and (iii) the institutional framework. Initially, Government's broad policy was to diversify the economy into industry away from being an almost exclusively agricultural country. The industrialisation policies and instruments have all favoured large-scale industry rather than small. This applied to credit, exchage rate, industrial and import licensing. The bias has been reduced with liberalisation, but still exists. The concern for small-scale industry is reflected in the 7th Plan (1988-93).

Government's role in the promotion of small-scale firms has been negligible compared to the promotional measures for the large-scale industry. The change in government industrial policy in the 1970s reduced the bias for large-scale sector. Firstly, government took direct measures to promote small-scale sector which included : (i) transfer of decision making power to the provinces ; (ii) tax exemptions to selected small-scale industries ; (iii) tax concessions on capital goods import for small-scale firms in underdeveloped areas : and (iv) liberalization of imports to ease raw materials shortages. Secondly, certain economic policies such as nationalisation of large industries also indirectly supported the small-scale secter.

At present, small-scale industries benefit from (i) export promotion measures ; (ii) concessional credit ; (iii) training ; and (iv) setting up of industrial estates. The new economic policy lays special emphasis on the export potential of the small-scale sector.

However, the existing arrangements, in particular for financing rural small-scale enterprises, are not satisfactory. Particularly, loans do not reach the "really small" enterprises. The Punjab Small Industries Corporation's rural industrialisation programme, initiated in 1982, has only partly met the financial needs of the small enterprises in the rural areas. In the absence of sufficient institutinnal assistance, the rural small enterprises, including cottage and artisan workshops, rely on non-institutional sources such as family loans, money lenders, and suppliers credit.

More recently, steps were taken under Prime Minister's 5-point Programme to promote rural industries by establishing mini-industrial estates at district level, besides the plan to start the model village Programme. These programmes included two important schemes, viz., farm to market roads, and extensive rural electrification. In addition to these, government planned to provide other infrastructural facilities and credit to the rural areas to develope skills for the promotion of rural industrial enterprises. These schemes have now been replaced by Peoples Works Programme which also have similar objectives.

To sum up, since RSIP are in the informal sector, so they are often ignored than assisted. Thus these enterprises operate largely outside the system of institutional benefits. Hence a strong case exists for providing policy and institutional support to promote RSIP. How then did such a large-sized sector managed to emerge in Pakistan ?

3. Sources of Growth

The existence of large dynamic rural small industries sector is owed to the following four favourable factors in Pakistan :

(1) an age—old industrial tradition.

(2) strong agricultural base.

(3) a pattern of local population concentrations in the most prosperous agricultural areas.

(4) a well-developed transport and trade sector.

These factors show wide regional variation, and where one is lacking, RSIP are not doing well.

3.1 Age-old Industrial Tradition

Industrial traditions in Pakistan go back to time immemorial. Since 3000B.C, Indo-Pakistani manufactures have been exported to Egypt and other countries. Most well known among them were the cotton fabrics, ceramics, carpets, embroidered garments, jewellery, wood and leather products. Since the end of middle ages, addition of metal products further enriched the list of manufactures of this area. Most of the exported goods were produced in the rural crafts located near the main trade routes. While urban traders took care of the supply of high quality materials and the marketing of the finished products. This pattern still prevailes in Pakistan.

3.2 Rural Base

Another feature of rural small industries in Pakistan (RSIP) is their rural base. Evidence suggests that the rapid growth of Pakistan's rural small industry came largely in response to green revolution, initiated in the mid-1960s, which greatly enhanced the rural manufacturing of agricultural machinery and consumer goods. As farm incomes rose, there probably also increased capital stock per worker and rural wages, besides improvement in education, skills and organizational ability. By virtue of sheer market size, the RSIP benefitted from the growth potential. On the inputs side, RSIP have been able to capture a substantial part of the market of machinery and equipment, and industrial services. RSIP appear to match very well with the small-farm sector as it is able to offer the appropriate goods and services to the small farmers. In this sense, the RSIP function as technological intermediary at the lower farm level. (Aftab and Rahim, 1986).

Much of RSIP activities concentrate on the processing and transformation of agricultural output. Food processing, oil expelling,

textile, furniture and many other manufacturing industries depend on the agricultural products. Therefore governments attention is mainly directed towards agriculture, agro-processing, and agriculture-related activities.

3.3 Population Concentration in Prosperous Areas

Increasing population provides on expanding market for industries. A high population growth rate of 3.1% has been a growth incentive for rural small enterprises as much as for the large-scale firms. Consumer goods industries have probably benefitted more from high population growth than the producer good industries.

The fruits of farm household consumption—RSIP linkage have, however, not been uniformly distributed. Since rural population is generally concentrated in prosperous areas, therefore the RSIP also cluster around these centres. Modernization of agriculture has increased farm incomes, thus increasing demand for manufactured goods, particularly consumer goods which have been traditionally produced by RSIP. So we observe concentration of RSIP in prosperous agricultural areas. Yet this factor should not be over-emphasised as commercialisation of the countryside is also progressing very fast in Pakistan. This is amply shown by small-town, even village, shops trading in urban products. This applies to the densely and the sparsely populated areas. Only their activities differ. While the densely populated areas abound in manufacturing activities, the less populated regions rely on trading. What share of additional rural income is actually spent on products of RSIP is not known so for. Demand-side analysis of RSIP definitely calls for such an assessment.

3.4 Transport and Trade Network

Large sized RSIP sector also owes itself to a well developed transport and trade network in Pakistan. Over the years, the traditional commercial network has developed into all kinds of trade and transport activities ensuring smooth distribution of products and raw materials.

Pakistani traders are involved in business as well as production. They act as development agents. A trader may turn into a producer

after gaining experience and production expertise. This transformation is often supported by private financial support.

RSIP is part of a long standing manufacturing tradition of a large-small linkages. Subcontracting is practised in many lines of production, especially traditional products such as carpets, garments and foot-wear. The division between large and small units is essentially a matter of economies of scale and availability of cheap labour in the rural areas, Thus penetration of RSIP in the countryside is influenced by the trade channels. In areas with fully developed trade facilities, the RSIP are seen to be present far into the interior of country side. The immense significance of transport and trade network for the promotion of RSIP can not be overemphasised.

To sum up, Pakistan's rural small industries sector now occupies on important position in the economy. Over the years, this sector has greatly expanded in terms of size and variety of production. The emergence of these firms has taken place in the background of (1) overall development policy, (2) the industrial policy, and (3) the institutional setting in Pakistan. But the real sources of growth were : (1) old industrial tradition, (2) strong agricultural base, (3) population trade, and (4) well developed transport and trade sector.

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US Aid to Pakistan—A Historical Analysis*

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Introduction

From the start, political factors have dominated the overall US-Pakistan economic relationship. At the same, this relationship has also been dominated by misperceptions in each country concerning the extent to which the national interests of the two countries converged and where they diverged. As a result, the bilateral relationship has been characterized by peaks and troughs. When there was convergence of interests, the relationship virtually became an alliance. In periods of divargence of interests, the very closeness of the previous ties seems to have intensified the resultant estrangement.

Decade of Alliances

Pakistan, at the time of independence, fitted into the classical text book definition of an under developed country. It was widely considered as an economic monstrosity. It had predominaly agrarian economy, exported primary commodities and imported manufactured goods, mainly consumer goods. All new states have to face problems of bewildering complexity. Pakistan too had its share of numerous peculiar problems. It comprised of two parts of former British India, separated by a thousand miles of Indian territory. Of the well-organised provinces of the sub-continent, only the under-developed areas of Sind. Baluchistan and North West Frontier province come to Pakistan intact, Punjab and Bengal had been truncated. New frontiers cut off raw materials in Pakistan from the factories located in India. Trade, commerce and agriculture were similarly disrupted.

* This paper is based on author's MSc. thesis: U.S. Aid to Pakistan (1977–87).

The initial motivation for forging a relationship between the USA and Pakistan was reflected in Pakistan's overtures, prompted by necessities created by the partition of the sub continent. The large scale human and economic dislocation of partition placed unusual burden on the new government in Pakistan. It was thus necessary to acquire surrogate patrons to provide assistance as well as to serve as a source of support as a fulcrum to be used is developing a strategy and sense of protection against India.

United States of America, whose global policy after the World War-II was predicted upon the assumption of Soviet policy being a continuation of continental Russian expansion, perceived Pakistan as a bulwark against Soviet expansion and thus were laid the foundations of a relationship that todate has seen many ups and downs.

Aid to Pakistan started in 1950 under the Colombo Plan. In its policy statement on Pakistan dated April 3, 1950 the State Department indicated that US policy was to assist Pakistan in satisfying its requirements from the West and further indicated that the United States would "give sympathetic consideration to applications by Pakistan for licenses to export supplied procured from commercial sources". (Jan, 1983, p. 30).

A mutual Defence Assistance Agreement between the United States and Pakistan became effective on Dec. 15, 1950. Liaquat Ali Khan toured United States and soon after his return on Feb. 2, 1951 Pakistan signed its first technical assistance agreement with United States of America. In September, 1952 the Export-Import Bank of USA provided generous credit at the market rate of interest. In the earlier years, the US and Colombo Plan commitments were almost exclusively for technical and project assistance. When the harvest failed in 1951 & 1953 Pakistan appealed for and received emergancy wheat shipments from USA, Canada and Australia.

The trend of aid inflows to Pakistan increased substantially with Pakistan's entry into US sponsored military alliances viz SEATO & CENTO during 1954 and 1955 respectively. The two treaties from the point of view of its western sponsors, particularly the US, were meant to

defend the countries of South East Asia against the menace of communist aggression from Russia and China.

Table 1 depicts Foreign Economic assistance to Pakistan in the first decade. Column 3 shows aid as percentage to total world aid. Column 6 & 8 shows loan component in aid from USA and world respective. Similarly columns 10 & 12 show Grant Component in aid from USA and World respectively. The fact that Pakistan became dependent on USA by the end of 50's is shown by the fact that the share of the US aid in the total aid received by Pakistan sharply increased from 21.31% in 1951–52 to 80% in 1959–60.

Pakistan had joined these military alliances primarily with the purpose of strengthening its own position vis-a-vis India and getting rid of economic difficulties. The USA on the other hand was basically interested in defence against communism. Mutual interests thus helped in forging close economic ties between the two countries.

Pakistan policy makers, on their own part, were also responsible for leading Pakistan into this trap. Liaquat Ali, Bogra, Chaudhry Muhammad Ali, Chundrigar and Noon were exponents of the policy of unqualified alliance with the USA. The grant component in US aid to Pakistan rose to 77% in 1959—60 as these leaders, drawn mainly from a feudal and urban elite, trained and educated in Western traditions had shown a proclivity for the West. It seems evident that the US policy focused upon Pakistan as a country of strategic importance in South Asian region. US policy makers were particularly responsive to bureaucratic and military interests and elites and to the advocacy that placed Pakistan clearly in the category of states that could be useful to the USA in its policy of containment.

Decade of Conflict

The thaw in cold war in the early 1960s appears to have diminished Pakistan's position in US's strategic interests. The role of China loomed large in the United States major foreign policy dilemma of the 1960's—Vietnam ; and it replaced the Soviet Union as the course of moral and ideological inspiration for revolutionary struggle with the mobilization of the social "peripheny" in Third World States. (Barnds, 1972). In this changed global context the

TABLE 1

Volume, Terms and Condions of US aid to Pakistan (1950—60)

Year	Total foreign aid from all Sources Million US $	Total U.S. aid Million US $	U.S. aid expressed as % of Total aid	ROI	Amortization Period	Loan Component in U.S. aid Million US $	%	Loan Component in World aid Million US $	%	Grant component in U.S. aid Million US $	%	Grant component in world aid Million US $	%
	1	2	3	4	5	6	7	8	9	10	11	12	13
1951 – 52	43.0	9.2	21.39%	—	—	NIL	—	30.5	70.93%	9.2	100.0 %	12.5	29.06%
1952 – 53	106.3	99.3	93.41%	2.5	44	15.0	15.10%	15.0	14.11%	84.3	84.89%	91.3	85.88%
1953 – 54	87.8	29.2	33.25%	—	—	NIL	—	42.0	47.83%	29.2	100.0 %	45.8	52.16%
1954 – 55	101 8	78.5	77.12%	—	—	20.0	25.47%	33.8	33.20%	58.5	74.52%	68.0	66.79%
1955 – 56	147.5	110.6	74.98%	—	—	NIL	—	18.9	12.81%	110.6	100.0 %	128.6	87.18%
1956 – 57	130.2	109.0	83.71%	—	—	68.	62.38%	68.0	52.22%	41.0	37.61%	62.2	47.77%
1957 – 58	233.6	110.8	47.39%	6	5	27.0	24.36%	122.4	52.35%	83.8	75.63%	111.4	47.64%
1958 – 59	284.3	238.3	83.73%	—	—	142.3	59.71%	171.1	60.11%	96.0	40.28%	113.5	39.88%
1959 – 60	236.2	133.5	77.68%	—	—	42.0	22.88%	73.7	31.20%	141.5	77.11%	162.5	68.79%

SOURCE : Computed from various Economic Surveys of Government of Pakistan.

place of Pakistan in terms of US strategic interests became less important although its place as a show place of capitalist development in Asia was magnified. This was clearly reflected in the changing pattern of US aid to Pakistan. As shown by Table 2 the percentage of US aid in World Aid to Pakistan increased from 53% to 72.5% in the early 1960s.

Despite all this Pakistan failed to receive any solid commitment of help from its allies in case of any danger to its security from India. The growing realization that Pakistan could not rely on its western allies for help against India, coupled with the episode of U-2 and the resulting threat of USSR led to the thinking that "Pakistan might be crippled by a surprise nuclear or rocket attack before Pakistan's friends could come to its aid." (Khan, 1967).

The Sino-Indian border dispute induced the development of a military assistance relationship between USA and India. The movement of the US towards India was perceived as a movement away from Pakistan. The result was predictable. As the table 2 shows, the grant component in US aid to Pakistan decreased to 35.45% in 1964—65. Pakistan-China friendly relations further irritated the US State Department "who would not reconcile with the idea that Pakistan should be acting in the field of foreign affairs without their permission". (Khan, 1967 p. 59).

In June, 1965, Pakistan Government received a threat from the US demanding "to accept certain terms before flow of funds for the Third Five Year Plan could start. These conditions were such that no sovereign State could accept. (Qureshi, 1978 p. 329).

When this did not work the USA got the Aid to Pakistan Consortium meeting, scheduled for July 1965, postponed for two months. This action by the USA was regarded as a naked effort on the part" of an aid donor to apply pressure to the recipient nation by withholding needed aid" (Babar, 1974, p. 107—108).

A glance at the Table 2 shows the changing pattern of US aid in the IIIrd Five Year Plan. The share of US aid to total aid to

TABLE 2

Volume, Terms and Conditions of U.S. aid to Pakistan : 1960—70

Year	Total foreign aid from all sources Million U.S. $	Total U.S. aid Million U.S. $	U.S. aid expressed as % of Total aid	ROI	Amortization Period	Loan Component in U.S. aid Million U.S. $	%	Loan Component in world aid Million U.S. $	%	Grant component in U.S. aid Million U.S. $	%	Grant component in world aid Million U.S. $	%
	1	2	3	4	5	6	7	8	9	10	11	12	13
1960—61	460.9	244.4	53.02%	Variable	20	119.3	48.81%	306.6	66.52%	125.1	51.18%	154.3	33.47%
1961—62	411.7	298.5	72.70%	Variable	25	125.9	42.17%	207.5	50.40%	172.6	57.82%	204.2	49.59%
1962—63	637.6	391.3	61.37%	Variable	25	243.0	62.10%	437.0	68.53%	148.3	37.89%	200.6	31.46%
1963—64	638.7	265.9	41.63%	Variable	25	113.1	42.53%	455.7	71.34%	152.8	57.46%	183.0	28.65%
1964—65	830.3	462.7	55.72%	Variable	25	298.7	64.55%	554.6	66.79%	164.0	35.44%	275.7	33.20%
1965—66	475.3	236.0	49.65%	a	40	80.1	33.94%	278.7	58.63%	155.9	66.03%	196 6	41.36%
1966—67	607.3	342 8	56.44%	4	40	276.2	80.57%	488.2	80.38%	66.6	19.42%	119.1	19.61%
1967—68	638.8	256.1	38.52%	b	40	171.3	69.60%	531.2	83.15%	74.8	30.39%	107.6	16.84%
1968—69	632.3	244.1	38.60%	b	40	180.2	73.82%	491.6	77.74%	63.9	26.17%	140.7	22.25%
1969—70	543.3	211.5	38.92%	9	40	187.5	88.65%	480.6	88.45%	24.0	11.34%	62.7	11.54%

a=1% for first 10 years and 2.5% after

b=2% for first 10 year and 3% after

Source : Economic Survey of Government of Pakistan 1976—77.

Pakistan fell sharply to 56% in 1966—67. But when the III Five year plan was completed in 1969—70, the share had been reduced to 38%. In the early years of IIIrd Five Year Plan, the loan component in the US aid was 34%. When the plan ended in 1969—70 the loan component had increased to 89%.

This evidence clearly shows that the US—Pakistan aid relations passed through great strains. The political events of this period led to a significant reduction of US Aid to Pakistan. Not only had the economic disparities between East & West Pakistan and inequalities of income distribution been sharpened as a result of the growth strategy pursued by the regime, but even the economic growth picture in the country had begun to assume sombre colours.

Years of Upheavel (1970—77)

The last six months of Ayub Khan's rule marked the turning point in the economic history of Pakistan. The downward trend that started in the last quarter of 1968 led to the resignation of Ayub in March, 1969. The fall of Ayub was in part prompted by his relationship with USA. Ayub could not divorce himself from the USA and Pakistan's resentment over US actions only tended to increase the burdens of his administration. But even before new foreign policy could take shape, the country was consumed by political controversy. It left the task of resurrecting Pakistan's foreign as well as domestic policy to Bhuto's People Party.

The Fourth Five Year Plan (1970—75) was drawn up against this background. The plan proved to be still born. It had been drawn up in the framework of an individual Pakistan. The separation of Bangladesh in Dec., 1971 rendered it infractuous. East Pakistan seceded and with it almost three-fifths of the country's population. The eastern province had also been an important foreign exchange earner, and the Pakistan's economy was seriously destabilized. As is evident from Table 3 share of US aid in total aid was reduced drastically in 1970—71 to 14.81% and this included a loan component of 54.9%.

TABLE 3

Volume : Terms and Conditions of US aid to Pakistan : 1970—77

Year	Total foreign aid from all sources Million U.S. $	Total U.S. aid Million U.S. $	U.S. aid expressed as % of Total aid	ROI	Amortization Period	Loan Component in U.S. aid Million U.S. $	%	Loan Component in world aid Million U.S. $	%	Grant component in U.S. aid Million U.S. $	%	Grant Component in world aid Million U.S. $	%
	1	2	3	4	5	6	7	8	9	10	11	12	13
1970—71	872 8	129.3	14.81%	b	40	71.1	54.98%	777.5	89.08%	58.2	45.01%	95.3	10.91%
1971—72	143.1	103.7	72.46%	0	40	65.4	63.06%	81.6	57.02%	38.3	36.93%	61.5	42.97%
1972—73	543.3	239.0	43.99%	b	40	212.4	88.87%	494.5	91.01%	26.6	11.12%	48.8	8.98%
1973—74	1268.9	158.2	12.46%	b	40	125.1	79.07%	1199.5	94,53%	33.1	20.92%	69.4	5.46%
1974—75	1114.6	139.6	42.52%	b	40	97.8	70.05%	1014.6	91.02%	41.8	29.94%	100.0	8.97%
1975—76	957.6	190.0	19.84%	b	40	178.8	94.10%	855.6	89.34%	11.2	5.89%	102.0	10.65%
1976—77	1114.6	284.7	25.54%	—	—	248.2	87.17%	927.4	83.20%	36.5	12.89%	187.2	16.79%

b=2% for first 10 years and 3% after

Source : Economic Survey of Government of Pakistan 1976—77

The loss of East Pakistan made Pakistan's continuance in SEATO meaningless and Bhutto announced the nation's withdrawal from the alliance. In Feb. 1974 Bhutto hoisted a summit meeting of the world's Muslim leaders. Both Pakistan and Bhutto profited from Lahore Summit. Pakistan found it easier to acquire needed funds from the oil rich Ara States and Bhutto had placed himself in the forefront of world Muslim Leaders much to the annoyance of US.

Out of the Muslim countries aid of $ 1992. 152 million received by Pakistan during 1972—73 to 1975—76, 49.83% came in the form of grants. It is interesting to note that during 1975—76 grant component in US aid had touched its lowest i.e. 5.89% clearly indicative of the fact that Pak had lost its prominence in US policy makers' eyes. Bhutto's decision to go nuclear invoked US wrath. The US economic aid was further cut down and US share in total aid reduced to 25.54%. The increase in US aid component from 12.52% in 1974--75 to 25.54% in 1976--77 represented actually the state of military ware rather than increase in economic aid. The loan component in World Aid too sky-rocketed to 83.2%.

Decade of Rapprochment (1977—87)

US policy in South Asia had bewildered Pakistan. This became more pronounced during the Carter Presidency. In the past, though South Asia had been considered a low priority area in the US policy since 1960, Washington's approach generally gave a semblance of "balance" in its handling of relations between India and Pakistan. President Carter became the first US President to visit India and not touch Pakistan.

As the Table 4 shows the US aid in world aid steadily decreased In 1977—78 it was 5.8%. Further as the table indicates the loan component in the US aid had tremendously increased. It had gone up to 99.29% in 1977—78. Similarly in 1978—79 the US aid was 9.04% of World aid and the loan component was 99.68% showing how stringent the US external assistance had become.

TABLE 4

Volume, Terms and Conditions of U.S. Aid to Pakistan (1977–87)

Year	Total foreign aid from all sources Million US $	Total US Aid Million US $	US aid expressed as % of Total aid	ROI	Amortization period	Loan component in US aid Million US $	%	Loan component in world aid Million US $	%	Grant component in US aid Million US $	%	Grant component in world aid Million US $	%
	1	2	3	4	5	6	7	8	9	10	11	12	13
1977–78	978.8	56 8	5.80%	v	v	56.4	99.29%	827.5	84.54%	0.4	0.70%	151.3	15.45%
1978 - 79	1408.9	127 4	9.04%	v	v	127.0	99.68%	1121.7	84.22%	0.4	0.31%	222.2	15.77%
1979–80	1713.2	267.3	15.60%	v	v	149.0	55.74%	1402.8	81.88%	N + AR 1.5+116.8=118.3	44 25%	310.4	18.11%
1980–81	988.4	168 3	17.02%	v	v	58.4	34.69%	755.2	76.40%	0 3+109.6=109.9	65.30%	233.2	23.59%
1981–82	1677 2	489 1	29.16%	v	v	146.0	29.85%	1191.4	71.0 %	27.5+315.6=343.1	70 14%	485.8	28.96%
1982–83	1689.3	549.8	32.54%	v	v	199.5	36.28%	1225.7	72.55%	109.5+240.8=350.3	63.71%	463 6	27.44%
1983–84	1988 0	502 2	25.26%	v	v	141.3	28.13%	1482.0	74.54%	205.7+155.2=360.9	71.86%	506.5	25.45%
1984–85	2311 2	573.4	24.80%	v	v	256.4	44.71%	1799.5	76.85%	167 0+150 0=317.0	55.28%	511.7	22.14%
1985–86	2150.2	415 7	19.33%	v	v	162.8	39.16%	1721.7	80.07%	117.9+135.0=252.9	60.83%	428.5	19 92%
1986–87	1332 1	246 8	18.52%	v	v	115.3	46.71%	1070 4	80 35%	63 4+ 68 1=131 5	53.28%	261.7	19 84%
1987–88	1542.1	373 8	24.23%	v	v	143 0	38 25%	1187.7	77 01%	110.8+120.0=230.8	61.74%	61.4	354.4%

Notes: N = Normal Grants

AR = For Afghan Refugees.

V = Varying

Source: Economic Survey of Government of Pakitan 1987–88.

However, the Soviet move into Afghanistan marked a turning point in US strategy in general and toward Pakistan in particular. Moscow's venture into Afghanistan led Washington and other Western capitals to believe that this move was a prelude to a Soviet foothold on the Arabian Sea. From where the USSR could threaten western interests in Gulf and Indian Ocean.

Responding to changing situations and changes in US public opinion, the USA reversed its earlier policy towards Pakistan. The shift was phenomenal. Pakistan became a new "Frontline State" that needed support in face of Soviet aggression designs in South West Asia.

In August, 1981, came the announcement of the agreement of both Governments to a $ 3.2 billion package of US economic and military assistance over a six year period. Soon Pakistan found herself into third position among major US aid recipients after Israel and Egypt.

The US containment policy and the relevance of Pakistan to the "northern ties" concept in the southern flank of the Soviet Union offer Pakistan an opportunity to break the siege of isolation and negotiate a six year (1982—87) "aid-cum-sales relationship" with USA. Pakistan has received $ 3.2 billion military sales and economic aid from USA but as always, USA entered into this relationship only when American policy makers realized that Pakistan was the only country in the region from which they could project their influence northward into Afghanistan and westward into Persian Gulf.

Conclusion

In the final analysis the thing to be noted about Pakistan's almost four decades of ties with the United States is that it has been highly unequal relationship. No matter, how hard Pakistan might have to pretend to the contrary, it has been a client state for most of that period and successive American administrations have treated it as one. Not surprisingly, therefore, the relations, except for the early honeymoon period of cold war, have been marked by ups and

downs, more downs than ups, touching the nadir twice in 1965 and 1977. Bearing in mind Washington's unrelenting endeavours to assert and impose its global supremacy on the one hand and Pakistan's position as one of the world's most impoverished states on the other, it is hardly surprising that their relations have lacked balance. What has really complicated matters, however, is that each side has sought to secure objectives that have tended to be contradictory. While Pakistan's dependence on U.S.A. is mostly economic, the USA's dependence on Pakistan is strategic. And once this built—in ambivalence was fully exposed, mutual trust and confidence—the hallmark of friendship—were found wanting.

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BOOK REVIEW

Where Keynes Failed !

"Tax deposit accounts, compel people to transfer into investment in producer goods, generate employment and you have sorted out the problem of recession"—a problem Keynes failed to solve (!) At least this is what Dr. Arthur Dahlberg argues with great fervour in his book : 'How to Reduce Interest Rates and Poverty', Devin—Adair Publishers, Greenwhich, Conn, U.S. 1984.

Set in the U.S. background, this book attempts to answer an important question : why the capitalist world repeatedly faces recessions inspite of having a fine economic system ? Dr. Dahlberg (a consultant to Citibank) thinks that the real solution to the problem of recession lies in modifying roles of money through appropriate policies (sorry, no support lent to the monetarist remedy). He asserts that the root cause of this phenomena is deep and never fully appreciated by the theoreticians. The author believes that the economists have consistently failed to appreciate the implications of 'Store—of—value' role of money in causing economic depressions.

With the aid of extensive graphical representations, Dr. Dahlberg speaks compassionately against the store—of—value function of money since it results in huge accumulation of demand deposits in financial institutions—called "hoarding". This hoarding is responsible for lengthening the interval between transactions, resulting in reduction in investment spending. If it occurs on a large scale, it causes recession in the capitalist world. Since money is largely being kept in demand deposits, it is undersirable as it "possesses an excessive and disruptive store of value" (p. 59).

The author further argues that "collateral" provides a cushion of hoardability to demand deposits as the collaterized debt obligations "create only a potential demand which is sometimes prompt and sometimes not" [p. 31]. Thus it creates a barrier between production and its own market demand. In Dr. Dahlberg's opinion the delayed response of demand to supply witnessed in the advanced economies is what J.B. Say referred to as the "unusual barrier". He also asserts that though Keynes identified how money savings sometimes fail to flow into investmnet, he failed to realize how providing collateral for loans had given hoardability to loans.

The solution to this endemic problem which caused at least 8 recessions (i.e. disruption of flow of money from the savers to investors) in the U.S. since the War is believed to lie in building sufficient pressure so that 'money savings' are not held too long. It is argued that if we tax demand deposits, there would be an immediate sharp drop in all interest rates, leading to more investments in producer goods. People would naturally dislike this levy but are likely to accept as the overall gains from it would outweigh the costs.

In the beginning, probably people would spend more money, pay bills little more promptly and transfer funds to savings accounts. But since the banks would lower return (interest) on savings accounts in line with the tax on demand deposits, the depositor, therefore, would have no other option but to accept the new terms. At any rate, the banks can now obtain cheaper funds and offer them at lower rates. This would result in production boom.

This interesting scenario raises two important questions : what will it cost to the depositors, and why should depositors transfer funds to saving acconnts. The author attempts to answer the first question by arguing that a 3 per cent tax would have cost only $ 5 billion on an estimated sum of $ 175 billion bank deposits in the U.S. in 1984. This amount is considered to be much less than the reduced buying power caused by otherwise necessary higher taxes and deficit financing to fill the budgetary gaps. So the buying power of people would not be reduced by the proposed tax. However, the

saving depositors would lose on interest as they would get less than before. The author argues, though without much weight, that they too would accept lower interest rates as they realize the gains to the economy. This part of the analysis seems rather prseumptuous as the author appears to accept the notion of identity of individual and collective interests—which calls for empirical testing.

Also in the case of the second question, the author's explanation appears to be unsatisfactory. It seems plausible that reduced return on savings accounts will probably prompt people to deposit less money in banks or even withdraw existing holdings for use elsewhere. It may encourage speculative investment or even increase consumption expenditure. In that case, the main objective of transfering bank money into capital investment may not be fully realized.

All said, Dr. Dahlberg's ingenious solution for the difficult economic problem of recession deserves serious attention of the economists and policy makers.

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