Some Tests for Differences in Consumption Patterns: The Impact of Remittances Using Household Income and Expenditure Survey Data of Pakistan 1987-88

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I. INTRODUCTION

It is argued generally that the observed pattern of use of remittances[1] by emigrant families reduces their effectiveness for economic development and growth. A large school of thought believes that a considerable portion of the remittance money is spent on raising current consumption, in making unproductive investment in real estate such as residential houses, and in acquiring consumer durables, etc. Such expenditure, apart from being inflationary in nature, also has a strong demonstration effect on the consumption patterns of families that do not receive remittances. Another aspect of the alleged consumption-oriented use of remittances is the relatively high import content of the consumption demand generated by remitted funds. This has the adverse implication of offsetting some of the balance of payments gains. There is, therefore, a need to critically examine the utilisation pattern of remittances in terms of statistically testing for differences in consumption behaviour between households that receive remittances and those that do not. This study attempts such an analysis based on the data from the Household Income and Expenditure Survey of 1987-88.[2]

[1]This paper analyses both types of remittances separately i.e. remittances received from household members migrating within the country referred to as domestic remittances and those received from household members migrating abroad referred to as international remittances. Please note also that in this paper households reporting remittances are referred to as migrant households with the domestic or international signifying where the remittances are coming from. Apologies are offered to the semantic purists that might find this terminology confusig.

[2]For an analysis of consumption behaviour see, [for example, Stone (1954, 1954a); Brown and Heien (1972); Ranis (1961); Rehman (1963); Bussink (1970); Cheema (1983); Cheema *et al.* (1984, 1985); Khan (1963); Siddiqui (1982); Malik (1982); Malik *et al.* (1987, 1988); Ahmad *et al.* (1987, 1988); Ali (1981, 1986); Burney and Khan (1990, 1991); Burney and Akhtar (1990); Burney and Akmal (1991); and Kruijk (1991)]. For studies of migration and remittances see, for example, Adams (1989, 1991, 1992); Gilani *et al.* (1981, Part 1); Burney (1987); and Amjad (1986).

One important aspect of this paper needs to be noted. Since this is a study of remittances, the focus is on economic migrants, that is, on people who left their households to work either inside or outside of Pakistan and who remit money to the household. Domestic and foreign remittances were valued in terms of the income that households reported receiving from current migrants (i.e., net of all migration expenses). It is important to note also that these do not include the savings held outside the household by migrants.

This study is divided into four sections. The second section is devoted to the method of analysis adopted and the main features of data used in the study. The empirical results are presented in the third section; while the major conclusions of the study and policy implications are summarised in the last section.

II. DATA AND METHODOLOGY

The objective of this study is to determine whether in fact the expenditure patterns based on with and without remittance incomes are identical across various regions of Pakistan. We attempt to explore the existence or absence of similarity in expenditure patterns in relation to with and without remittance income for Pakistan, for the four provinces, and across regions (rural and urban) in each.

Most previous studies have taken household income and family size as the two most important determinants of family consumption behaviour. The inclusion of the family size variable helps to isolate differences in consumption patterns arising out of rural-urban family size differentials and facilitates computation of estimates of economies of scale in consumption see Ali (1981); Siddiqui (1982) and Malik *et al.* (1988). Since the households are not identical in their composition this by itself has an influence on the pattern of consumption apart from variation in income and other factors. However, the family size variable and the income variable are strongly correlated. We, therefore, divide through by family size to conduct the analysis on a per capita basis. While this makes it difficult to obtain estimates of the economies of scale see Ali (1981); Siddiqui (1982) and Bussink (1970), it helps us avoid the problem of serious multicollinearity.

The simple linear formulation of the Engel curve[3] is:

$$C_i = \alpha_{0i} + \beta_i Y + e_i \qquad \ldots \qquad \ldots \qquad \ldots \qquad (1)$$

where i = 1, 2, and 3 expenditure groups; i.e. consumption expenditure, durable expenditure and total expenditure; C = per capita consumption expenditure; Y = per capita income and e_i = error term.

In Equation (1) demand has been expressed solely as a function of the consumer's income, a relation which is generally known as the consumer's Engel curve for commodity, i. In estimating this functional relationship from cross-section data we assume that, on average, the differences in the consumption pattern between migrant and non-migrant households can be ascribed to their differences in current income (including remittances). Moreover, in this cross-sectional analysis based on data for 1987-88 we assume that prices are constant across regions.

The only theoretical restriction valid in the case of cross-section analysis is

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[3]Our results are based on simple linear formulation of Engel curve analysis. But the system of Engel Curves may also be derived from the Rotterdam model suggested by Theil (1965) and Barten (1966).

the "adding up" one, which restricts total expenditure elasticities.[4] Hence the problem simplifies drastically, as all the other restrictions in terms of price derivatives (homogeneity, negativity and symmetry) disappear.[5] In the region where the elasticity is around unity the linear form of the Equation (1) is a good approximation. This form assumes that the marginal propensity to consume (MPC) is constant. The implication of linearity is that income elasticity is always around one. If the intercept is positive this function would suggest an increasing elasticity whereas in case of a negative intercept the elasticity would be declining for necessities. As income increases the elasticity for both types of goods would tend to unity.

The relevant hypotheses for the tests for differences in consumption behaviour of households with and without remittance income are outlined below:

1. The with and without remittance functions have the same slope but different intercepts;
2. the with and without remittance functions have the same intercept but different slopes; and
3. the with and without remittance functions have different intercepts and slopes.

In each case, the null hypothesis is that the functions are similar. F-statistics based on the dummy variable approach are computed in each case. The F-values take the form:

$$F_{(m, N-k)} = \frac{(RSS_R - RSS_u) / m}{RSS_u / N - K}$$

where RSS_R = Residual sum of squares of restricted model; RSS_U = Residual sum of squares of unrestricted model; m = number of linear restriction; k = number of parameters in the unrestricted model; and N = number of observations.

Test for Differences in Consumption Patterns

Regarding each of the hypotheses outlined above, we estimate the following unrestricted regressions:

[4]Equation (1) satisfies the adding up condition which implies

$$\sum_{i=1}^{n} \alpha_{0i} = 0 \text{ and } \sum_{i=1}^{n} \beta_i = 1 \text{ and } \Sigma e_i = 0.$$

These properties are shared by all the Engel curve systems generated by an additive utility function.

[5]An important theorem in the theory of econometrics shows that gain in 'efficiency' is present whenever restrictions are imposed on regressions by ordinary least squares. The restrictions lead to important economies of parameterisation in terms of increased degree of freedom. See Theil (1965) or Goldberger (1964).

$$C_i = \alpha_{0i} + \alpha_1 D_{1i} + \beta_0 Y_i + \mu_i \qquad \ldots \qquad \ldots \qquad (2)$$

$$C_i = \alpha_{0i} + \alpha_2 D_{2i} + \beta_0 Y_i + \mu_i \qquad \ldots \qquad \ldots \qquad (3)$$

$$C_i = \alpha_{0i} + \beta_0 Y_i + \beta_1 (D_{1i} Y_i) + \mu_i \qquad \ldots \qquad \ldots \qquad (4)$$

$$C_i = \alpha_{0i} + \beta_0 Y_i + \beta_2 (D_{2i} Y_i) + \mu_i \qquad \ldots \qquad \ldots \qquad (5)$$

$$C_i = \alpha_{0i} + \alpha_1 D_{1i} + \beta_0 Y_i + \beta_1 (D_{1i} Y_i) + \mu_i \qquad \ldots \qquad \ldots \qquad (6)$$

$$C_i = \alpha_{0i} + \alpha_2 D_{2i} + \beta_0 Y_i + \beta_2 (D_{2i} Y_i) + \mu_i \qquad \ldots \qquad \ldots \qquad (7)$$

where

D_1 = dummy for domestic remittances; and
D_2 = dummy for foreign remittances.

The restricted form is the same in each test i.e.,

$$C_i = \alpha_{0i} + \beta_0 Y_i$$

We treat the households having no remittance income as the base category. The Equations (2) to (7) have been estimated for three expenditure groups, i.e., consumption expenditure, durable expenditure and total expenditure which includes both consumption and durable expenditures in relation to with (domestic and foreign remittances separately) and without remittance income for four provinces, their rural-urban regions and for overall Pakistan. It should be borne in mind that the estimates for the durable expenditure function should have included some measure of wealth as an additional explanatory variable but we were not able to do so because such data are not available. This limitation should therefore, be borne in mind. The analysis is conducted on the 18,144 households covered in the 1987-88 Household Income and Expenditure Survey. Details of the data are available in Sarwar (1991).

Table 1 presents summary data from the survey.[6] The Household Income and Expenditure Survey questionnaire provides information on several detailed items of consumption. A detailed investigation of each may not be very meaningful because many of these items involve zero consumption for a large number of households. Accordingly, we only consider variation in consumption in terms of groups of commodities rather than the individual items of consumption. In this connection, we concentrate on three broad heads of expenditure, that is, consumption expenditure, durable expenditure and total expenditure. These expenditure groups

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[6]This table is not presented here because of space constraints.

do not cover all the items of expenditure reported in the questionnaire. However, only about 85 percent of the total household expenditure is covered by these groups. Due to space constraints, details about inter-province and rural urban differences in each in the mean expenditure and income for non-migrants, internal migrants and international migrant households are not presented here.

III. RESULTS

Analyses based on the ordinary least squares (OLS) estimates using the SPSS PC$^+$ package for three expenditure groups, that is, consumption expenditure, durable expenditure and total expenditure in relation to with and without remittance income for the various regions of Pakistan are presented in this section. The test statistics associated with hypothesis 3 outlined above are presented in Table 2 for Pakistan, its four provinces and its rural-urban regions. Test statistics relating to the first two hypotheses are not presented here because of space constraints.

From Table 2, it is revealed that, except Balochistan for consumption and total expenditures and NWFP for all the expenditures, the functions are dissimilar for all the expenditure groups at 5 percent level of significance in the category of domestic remittances. This implies that statistically significant differences exist in the consumption patterns due to domestic and international remittances. These results imply that with the onset of remittances, the expenditure patterns are affected in an appreciable way both on average and at the margin.

The statistical tests reported before show significant differences in consumption patterns between nonmigrant and migrant households for internal and international migrant households. We, therefore, present in this section the relevant slope parameters for each type of expenditure for each category of household based on the differences observed in Table 2. These are presented in Table 3. The associated intercept parameters are presented in Appendix Table A-3.[7] It is interesting to note that the international migrant households have a lower propensity to spend on consumer goods. The overview of the urban-rural results shows that marginal consumption expenditure is also higher in the urban sector for migrant households. We find that for Pakistan as a whole the marginal propensities to spend are generally lower for households receiving international remittances than they are for households receiving domestic remittances. Moreover, in the rural sector of Pakistan from where the bulk of this migration takes place, the marginal propensities to spend on both consumption and in total are lower for both the domestic remittance receiving households and the international remittance receiving households as compared to the non-migrant households. This is a significant finding. It shows that the migrant households are more thrifty and do not have the relatively lavish consumption expenditures that they are conjectured in the

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[7]Appendix Table A-3 is not presented here because of space constraints.

Table 3

Parameter Estimates of the Expenditure Curves for Pakistan and its Provinces by Urban and Rural Sectors

Regions / Coefficients ↓	NONMIGRANT HOUSEHOLDS			DOMESTIC MIGRANT HOUSEHOLDS			INTERNATIONAL MIGRANT HOUSEHOLDS		
Expenditure Groups →	Consumption Expenditure	Durable Expenditure	Total Expenditure	Consumption Expenditure	Durable Expenditure	Total Expenditure	Consumption Expenditure	Durable Expenditure	Total Expenditure
Pakistan Slope	0.48	0.03	0.52	0.63	0.02	0.64	0.53	0.026	0.57
(Standard Error)	(5.06E-06)	(5.9E-08)	(4.5E-06)	(0.0147)	(0.0016)	(0.0139)	(0.0074)	(0.00096)	(0.007)
Pakistan-Urban Slope	0.46	0.03	0.50	0.69	0.011	0.71	0.55	0.029	0.57
(Standard Error)	(1.05E-05)	(1.2E-07)	(9.4E-06)	(0.027)	(0.003)	(0.026)	(0.012)	(0.0015)	(0.0122)
Pakistan-Rural Slope	0.55	0.02	0.58	0.53	0.014	0.56	0.51	0.029	0.54
(Standard Error)	(1.18E-05)	(1.7E-07)	(1.05E-5)	(0.0116)	(0.0016)	(0.011)	(0.0063)	(0.00076)	(0.0059)
Punjab Slope	0.53	0.03	0.56	0.64	0.02	0.65	0.65	0.02	0.66
(Standard Error)	(1.3E-05)	(1.8E-07)	(1.27E-05)	(0.0174)	(0.0021)	(0.0169)	(0.0138)	(0.0018)	(0.0134)
Punjab-Urban Slope	0.52	0.03	0.55	0.73	0.01	0.73	0.71	0.01	0.72
(Standard Error)	(3.35E-05)	(4.04E-07)	(3.16E-05)	(0.0365)	(0.0042)	(0.0356)	(0.0221)	(0.0027)	(0.0230)
Punjab-Rural Slope	0.54	0.02	0.57	0.54	0.02	0.56	0.31	0.03	0.34
(Standard Error)	(2.18E-05)	(4.46E-07)	(1.97E-05)	(0.0141)	(0.0022)	(0.0150)	(0.0187)	(0.0023)	(0.0178)
Sind Slope	0.41	0.04	0.45	0.63	0.03	0.66	0.43	0.045	0.48
(Standard Error)	(1.34E-05)	(1.33E-07)	(1.12E-05)	(0.0477)	(0.0048)	(0.0436)	(0.0176)	(0.0017)	(0.0161)
Sind-Urban Slope	0.4	0.04	0.44	0.63	0.03	0.66	0.42	0.044	0.47
(Standard Error)	(2.23E-05)	(2.27E-07)	(1.86E-05)	(0.0612)	(0.0062)	(0.056)	(0.0225)	(0.0022)	(0.0206)
Sind-Rural Slope	0.72	0.01	0.73	0.80	0.004*	0.81	0.42	0.07	0.49
(Standard Error)	(3.81E-05)	(2.95E-07)	(3.35E-05)	(0.1747)	(0.0154)	(0.0267)	(0.0782)	(0.0066)	(0.0734)

Table 3—(Continued)

Regions / Coefficients	NONMIGRANT HOUSEHOLDS			DOMESTIC MIGRANT HOUSEHOLDS			INTERNATIONAL MIGRANT HOUSEHOLDS		
	Consumption Expenditure	Durable Expenditure	Total Expenditure	Consumption Expenditure	Durable Expenditure	Total Expenditure	Consumption Expenditure	Durable Expenditure	Total Expenditure
NWFP									
Slope	0.55	0.027	0.58	0.53	0.025	0.56	0.25	0.055	0.31
(Standard Error)	(2.33E-05)	(3.74E-07)	(2.08E-05)	(0.0288)	(0.0036)	(0.0272)	(0.020)	(0.0023)	(0.019)
NWFP-Urban									
Slope	0.56	0.02	0.59	0.58	0.01	0.59	0.34	0.04	0.34
(Standard Error)	(3.53E-05)	(7.06E-07)	(3.09E-05)	(0.0503)	(0.0071)	(0.0458)	(0.0294)	(0.0039)	(0.0276)
NWFP-Rural									
Slope	0.43	0.03	0.46	0.48	0.029	0.51	0.18	0.05	0.25
(Standard Error)	(1.32E-04)	(1.40E-06)	(1.23E-04)	(0.0295)	(0.0039)	(0.0285)	(0.0011)	(0.0023)	(0.0334)
Baluchistan									
Slope	0.59	0.026	0.62	0.83	0.00*	0.83	0.60	0.024	0.62
(Standard Error)	(5.93E-05)	(3.80E-07)	(3.09E-05)	(0.1772)	(0.0141)	(0.1645)	(0.0303)	(0.0009)	(0.0281)
Baluchistan-Urban									
Slope	0.63	0.01	0.65	0.83	0.00*	0.84	0.59	0.012	0.60
(Standard Error)	(1.19E-04)	(6.45E-07)	(1.04E-04)	(0.1453)	(0.0108)	(0.1360)	(0.0341)	(0.0012)	(0.0319)
Baluchistan-Rural									
Slope	0.57	0.03	0.60	--	--	--	0.62	0.023	0.64
(Standard Error)	(1.10E-04)	(6.96E-07)	(9.40E-05)	--	--	--	(0.0521)	(0.0013)	(0.0481)

Notes: Figures in parenthesis are standard errors which have been indirectly estimated from the variance-covariance matrix.
*Denotes that all coefficients are statistically significantly different from zero.

popular literature to have. On this basis one can say with confidence that the statements as to the wasteful use of remittances cannot be applied to Pakistan overall. Regional differences in expenditure patterns do, of course, apply.

For international migrant households the marginal propensities to spend on total expenditures are highest in Punjab urban and lowest in NWFP rural. For consumption expenditures the MPC for this category of households are highest in Punjab urban and lowest in NWFP rural. For domestic migrant household s the marginal propensities to spend for total expenditures are highest in Balochistan urban and lowest in NWFP rural. For consumption expenditures the MPC for this category is highest in Balochistan urban and lowest in NWFP rural. For households with no remittance income the marginal propensities to spend on total expenditures are highest in Sindh rural and lowest in Sindh urban. For consumption expenditures also the MPC for this category is highest in Sindh rural and lowest in Sindh urban. The differences in these parameters are often large and as the statistics in Table 2 suggest also generally statistically different. There is thus a need to bear these differences in mind when devising any policies that impact on migration behaviour.

IV. CONCLUDING REMARKS

The objective of this paper was to test statistically the generally held belief that the rise in income (due to remittances), drastically alters consumption patterns. While our analysis reveals that consumption patterns are generally different not only across rural-urban sectors in each province and in Pakistan but also that these patterns are different for the different types of expenditures analysed. We also find that for Pakistan as a whole the marginal propensities to spend are generally lower for households receiving international remittances than they are for households receiving domestic remittances. Moreover, in the rural sector of Pakistan from where the bulk of this migration takes place, the marginal propensities to spend on both consumption and in total are lower for both the domestic remittance receiving households and the international remittance receiving households as compared to the non-migrant households. This is a significant finding. It shows that the migrant households are on average more thrifty and do not have the relatively lavish consumption expenditures that they are conjectured in the popular literature to have. On this basis one can say with confidence that the statements as to the wasteful use of remittances cannot be applied to Pakistan overall. Regional differences in expenditure patterns do of course apply.

Moreover, in devising policies to encourage or restrict outmigration specific account should be taken of these regional patterns. Increased consumption expenditures are not necessarily an evil since they imply an increased demand for goods and services and if these are locally produced can be quite beneficial. If,

however, the increased consumption is largely for goods and services that are imported then one needs to look at the structure of this demand rather carefully.

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"Some Tests for Differences in Consumption Patterns: The Impact of Remittances Using Household Income and Expenditure Survey Data of Pakistan 1987-88"

Malik and Sarwars' paper extends the empirical analysis of 'household consumption patterns to an important dimension. I have some comments to improve my own understanding of consumption behaviour in Pakistan.

First, family size is excluded from the analysis due to multicollinearity between income and family size. I think, if multicollinearity does not affect our estimates adversely, we should keep family size in the model for two reasons:

(1) The coefficient of family size gives us direct estimates of economies of scale in consumption.

(2) The correlation between family size and income is not due to direct *causal* link. This can be illustrated by two extreme instances, which largely determine the observed correlation. At one end we have families with one or two family members which are either very young (entering the labour force) or old. Both families tend to have lower income. At the other end very large families often include more earners, either because of the natural age structure or because they are in fact composite households, which results in higher family income. Therefore, exclusion of family size may have led to loss of information with no significant gain in terms of efficiency of the parameters.

Second, the authors have selected the linear functional form. Most empirical studies show that either the double-log form or the semi-log form performs better than the linear form. The authors do not give any reason for the choice of linear form.

Third, the choice of base to examine the differences in consumption behaviour across different groups is not clear. The restricted model includes households with no remittances, with domestic, and with international remittances. The unrestricted model is outlined to test for differences in consumption behaviour of households receiving no remittances with households receiving domestic remittances or with households receiving international remittances. If this is the case the sample size for each test should be different, but the results in the paper report the same sample size for each hypothesis implying a changing base.

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[1]These comments were given on the original paper presented in the Ninth Annual General Meeting of Pakistan Society of Development Economists.

Fourth, the authors test three alternative hypotheses for differences in intercepts, differences in slopes, and differences in slopes and intercepts. I think when we test hypotheses (1) and (3), the second hypotheses becomes redundant.

Fifth, the elasticity estimates and the sample size for each province should also be reported. This information is crucial for policy analysis.

Sixth, commodity disaggregation, at least by broad aggregates like food, clothing, housing, etc., would be more meaningful for policy recommendations.

Finally, the marginal propensity to consume with respect to total expenditure seem quite low. For example, for Sindh it is 0.45. This means marginal propensity to save will be 0.55, which seems very high.

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