

Workers' remittances and import demand in Pakistan

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Abstract

Using quarterly data for the period 1975–2004, this paper estimates import functions for Pakistan both at the aggregate and disaggregated levels. Findings show that remittances do have a significant impact on the demand for imports in the aggregate equation, with the elasticity for remittances being 0.15, and 0.70 for domestically generated income, in the long run (natural logarithm). Remittances, however, have no impact on the demand for imported consumer goods; their impact on the import of raw materials and capital goods are greater than that of domestically generated income.

JEL classification: F2

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1. Introduction

In economies such as Pakistan, remittances from temporary workers overseas have become increasingly important as a source of foreign exchange earnings. They have a significant effect in improving the balance of payments position and reducing dependence on external financing. Data show that workers' remittances ballooned from \$120 million or 20 percent of total merchandise exports in 1972, to as high as \$2337 million after a decade, surpassing merchandise exports by 10 percent (Amjad [1986], Burney [1987], Zaman and Shah [1997]).

Workers' remittances in the 1990s exhibited a declining trend with the exception of a few stable years. The inflow has gradually been reduced to almost one-half in the decade, declining from \$1848 million in 1990-91 to \$983 million in 1999-2000. The main factors responsible for the decline in the inflow of remittances appear to be the declining pace of construction activity in the oil-rich countries of the Middle-East, the changing composition of labor demand from unskilled to skilled labor force, and the higher rate of premium that prevailed in the open market exchange rate.

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In the past few years, workers' remittances, the second largest source of foreign exchange inflow after exports, once again continued to maintain a rising trend. Against the full-year target of \$3.8 billion, workers' remittances totaled \$3.45 billion during the first ten months (July-April) of the fiscal year 2005, as against \$3.2 billion in the same period last year, showing an increase of 7.5 percent. The United States continues to be the single largest source of cash workers' remittances, accounting for 31 percent, followed by the United Arab Emirates at 16.9 percent, Saudi Arabia at 14.7 percent, the United Kingdom at 9 percent, and Kuwait at 5.2 percent

Remittances have so far proved remarkably resilient and have hovered around \$4.0 billion since 2002-03 (Pakistan Economic Survey [2004-05]). According to the recent *World Economic Outlook*, remittances can help improve the country's development prospects, maintain macroeconomic stability, mitigate the impact of adverse shocks, and reduce poverty. The *Outlook* further states that remittances allow families to maintain or increase expenditure on basic consumption, housing, education, and small business formation. Pakistan has been receiving, on average, \$4.0 billion or 4 percent of GDP per annum during the last three years. Such a massive inflow of remittances has helped Pakistan build its foreign exchange reserves which, in turn, has provided stability in the exchange rate.

Overseas temporary workers' remittances ensure the importation of capital goods and raw materials—two ingredients of industrial development which Pakistan as a developing country needs. Before the 1970s, foreign exchange shortages prevented the country from importing necessary inputs for its development programs. Remittances from abroad not only eased the problem of foreign exchange, it helped in improving the balance of payments as well. So here we use remittances instead of foreign exchange in the import equations. In the case of Pakistan, foreign exchange without workers' remittances were not sufficient to import the necessary inputs for economic development. The foreign exchange requirements of Pakistan's macroeconomic policy regime hinged mainly on trade. The major trading partners, the USA and Western Europe, were the leading sources of foreign aid. Trade with East Asia and the Middle-East was limited. Fortunately, remittances emerged as the main source of foreign exchange. It allowed the country to improve the balance of payments problem on the one hand, and import necessary inputs for industrial development on the other. There is no question that the income from remittances was instrumental in allowing Pakistan to sustain the highest growth rates on the South Asian Sub-Continent throughout the 1970s, 1980s, 1990s and 2000. Thus, remittances helped finance not only Pakistan's increasing oil import bill but also a substantial portion of the capital goods and raw materials needed to increase the country's long-term productive capacity.

During the 1970s, 1980s and 2000 onward, the absolute amount of remittances flowing into Pakistan was so large that they were bound to affect the pace and structure of growth and investment in the domestic economy as well as the level and pattern of imports, both at the aggregate and disaggregated levels. It is usually

believed that much of the remittances earned by migrants are simply transferred to East Asia as migrant households buy imported vehicles and electronic goods from Japan, Korea and Hong Kong, among others. But in fact, the proportion of remittances targeted towards imported consumer goods was never very significant. The share of consumer goods as a proportion of total imports flowing into Pakistan actually declined during the period when remittances were at the peak level. During 1973-74, such goods represented nearly 20 percent of total imports. In 1982-83 their share had dropped to less than 7 percent. Throughout the period, imports of capital goods and raw materials necessary to establish and operate Pakistan's industrial sector represented at least two-thirds of the total imports. In 1973-74, capital goods imports represented 29.5 percent of total imports. In recent years their share increased to 36.5 percent of total imports (Pakistan Economic Survey, various issues).

This paper uses data for the period 1975 Q2 – 2004 Q4 to estimate the import functions both at the aggregate and disaggregated level, keeping in mind the importance of overseas workers' remittances for Pakistan.

2. Review of literature

Remittances play a potentially important role in the import demand functions, both at the aggregate and disaggregated levels, particularly where there is a foreign exchange problem. Despite this, the literature on import demand in LDCs pays little attention to the effect of remittances. By using aggregate national income as an explanatory variable, the existing literature implicitly ignores the fact that the coefficients in domestically generated and remitted income may be unequal (see, e.g., Khan and Knight [1988]; Sarmad [1989]).

Most of the previous works, except Nishat and Bilgrami [1991], estimate structural equations without specifying a complete model. Nishat and Bilgrami, on the other hand, specify a complete model in which the import demand equation imposes the above restriction. The basic assumption underlying import function estimates is that variation is primarily caused by variations in real income, Y_p , and the relative price of imports to domestic prices (see Khan and Ross [1977]). For developing countries, the specification of the import demand equation must take into account the limited availability of foreign exchange. For example, Sarmad [1989] and Khan and Knight [1988] estimated an import equation for different countries using the following specification:

$$M_d = f(Y, P_m/P_d, F_x)$$

where M_d = Import demand

Y = Real gross national product

P_m/P_d = Ratio of price of imports to domestic price level

F_x = Real foreign exchange reserves.

All variables are in natural log-form

Khan and Knight [1988] and Sarmad ([1989] have generally found satisfactory results for the parameters of interest. Nevertheless, it is notable that the mis-specification indicated by low Durbin-Watson values has been dealt with by mechanistic means. The low Durbin-Watson may be indicative of a significant omitted variable which could be remittances.

3. Remittances and import demand

Let us consider the case for differing parameters on domestically generated income and remittances. Kindleberger [1965] argued that the propensity to import out of remittances will be lower than out of ordinary income because remittances usually go to the subsistence of low-income groups, which have limited taste for foreign articles of consumption. On the other hand, Paine [1974:43], stated that "the propensity to import out of remittances may well be high, not low, because recipient families now have contact with foreign goods and living standards, particularly if the migrant worker member has returned home". Admittedly, these arguments border on the issue of personal tastes and relate only to the import of consumer goods. Moreover, these claims have not been tested by any empirical work. There is therefore a need for an empirical study not only to examine the impact of remittances on the import of consumer goods but also on the import of raw materials and capital goods. In our estimates, imports are disaggregated into consumer goods, raw materials, and capital goods.

Analysis of the effect of foreign exchange restrictions is a straightforward application of the microeconomics of rationing. The basic import demand equation is a conventional relative price and income demand curve to which we add shifts in the availability of foreign exchange as an additional constraint. The rationed goods are those which require foreign exchange to effect their purchase. There is also a certain level of "effective rationing" in domestically produced goods through exchange shortage limiting the flow of capital goods. In Pakistan, the prospective purchaser of foreign goods faces government-imposed limits on currency conversion. These limits do not apply to remittances that can be obtained and retained in dollars. It follows from this that the same amount of income, one coming from domestic activity and another from remittances, have unequal potential for the purchase of overseas goods. Remittances will clearly drive a proportionately greater quantity of such purchases toward the purchase of foreign-made goods. This is an additional institutional factor that goes in the same direction as the taste argument given by Paine, i.e., the parameter on remittances will exceed that on domestic income.

In the disaggregated work, we would expect a greater propensity to import for non-consumer goods for the following reasons: Import demand by producers

is for factor inputs. In Pakistan, domestic factor inputs are widely perceived to be inferior to imported alternatives. While this is also true for consumption goods, there is a larger element in the consumer budget, such as basic foodstuffs, which are much less subject to rivalry.

4. Model and results

Following the established literature, import functions are specified as follows:

$$LM_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + a_4LM_{t-1} + Q_1 + Q_2 + Q_3 \quad (1)$$

$$LMC_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + a_4LMC_{t-1} + Q_1 + Q_2 + Q_3 \quad (2)$$

$$LMI_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + a_4LMI_{t-1} + Q_1 + Q_2 + Q_3 \quad (3)$$

$$LMK_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + Q_1 + Q_2 + Q_3 \quad (4)$$

Where M_t = total imports

Y_t = domestic income excluding remittances, i.e., $(Y - R)$

R_t = remittances

P_t = relative prices (wp/pd)

MC_t = consumer goods imports

MI_t = intermediate (raw-material) goods imports

MK_t = capital goods imports

Q_1, Q_2, Q_3 = Quarterly dummies

$L = \text{Log}$

Before proceeding to the formal econometric analysis, we examine the univariate characteristic—the order of integration $I(d)$ of time-series data used in the analysis. In order to do so, the Augmented Dickey Fuller (ADF) and Phillip-Person (PP) unit root tests are completed (Phillips and Person [1988]; MacKinnon [1991]). The results of ADF and PP unit root tests confirm that the data series do not contain a unit root at levels as they are $I(0)$. Therefore, it can be assumed that the Ordinary Least Square (OLS) analysis of variables at levels provide non-spurious estimates.

Equations were estimated using a sample from Pakistan for the second quarter of 1975 to the fourth quarter of 2004. Three quarterly shift dummies were added to account for seasonality. All variables were in natural logarithms. OLS estimation

was used in all cases except in the import of capital goods equation. Maximum-likelihood method for AR(1) was used to correct serial correlation. There would have been little gain in using seemingly unrelated regression as all right-hand side variables were the same across equations due to data unavailability. The Lagrange multiplier test indicated that serial correlation was not a significant problem in the other equations. The results are presented in Appendix 2.

The suggestions in section three cannot be evaluated directly from the equations used in the literature as these are in constant elasticity form. The value of the parameters will reflect the absolute magnitudes of the different components of import demand. We therefore need to multiply these coefficients by the ratio of the means of the relevant import demand to remittance income and domestic income.

We also attempted direct evaluation through estimating linear forms. These suffered from substantial positive first-order serial correlation, which may be indicative of non-linearity as the double-log forms were largely free of this problem. The estimates shown in Appendix 1 were obtained using a maximum-likelihood correction for the first-order serial correlation. In the aggregate equation the point estimate for remittances is notably larger than for domestic income. As indicated, we cannot separate the components of this due to any induced taste effect à la Paine and the institutional asymmetry of governmental exchange controls. The marginal propensity to import out of remittances is large, suggesting considerable short-run problems for domestic industry. The decomposition of demand proves very interesting indeed. Domestic income and relative prices are still significant, with the conventional signs and the overall fit of the equations relatively unchanged. However, the 't' ratio on remittances now indicates that they have no effect on import demand for consumer goods at all. The large impact found in the aggregate equation is seen to be due to the dominance of intermediate goods (raw materials). The capital goods equation has a much smaller coefficient, which is not so well determined although it is still significantly greater than 0 at the 5 percent level.

The same sort of results are found in the log-linear forms (Appendix 2), although the effect of remittances in the raw-materials equation is much less well determined.

5. Summary and conclusion

There have been many previous studies on the import demand function for developing countries. These have generally taken account of relative prices, income, and foreign exchange constraints. The present study provided estimates of similar functions for Pakistan. Based on the nature of the Pakistan economy, it was deemed that the appropriate measure of exchange constraint was remittances from temporary workers overseas. We found that remittances had no impact on the demand for imported consumer goods. On the other hand, for capital goods and raw materials, remittances registered a positive impact with a point estimate that was greater than

remittances registered a positive impact with a point estimate that was greater than that for domestically generated income. This finding confirmed our expectations based on the nature of the domestic economy. The pattern seemed strongest for raw materials. This suggests that remittances may have made a vital contribution to economic growth as it is extremely difficult to substitute for raw materials when there are exogenous quantity constraints. The availability of raw materials should enhance the competitiveness of domestic consumer goods. The results for the relative price variable indicates that the lower-quality domestic rivals of imported consumer goods could price themselves into the market. Obviously this cannot occur unless the goods can be produced in the first place, which may be difficult given the severe rationing on key raw materials. Remittances are beneficial in this respect. They could be detrimental if this is offset by the increased demand for imports of consumer goods. This, however, has not been the case, as earlier stated.

Appendix 1**Estimates of total and individual import equations
(Linear form)**

$$M_t = a_0 + a_1 Y_t + a_2 R_t + a_3 P_t + Q_1 + Q_2 + Q_3$$

15.84	0.12	0.44	-11.56	-6.50	-32.32	-25.9
(7.16)	(8.43)	(3.0)	(-6.3)	(-1.4)	(-11.4)	(-13.7)

$$R^2 = 0.96 \quad D.W = 1.81$$

$$MC_t = a_0 + a_1 Y_t + a_2 R_t + a_3 P_t + Q_1 + Q_2 + Q_3$$

33.78	0.02	-0.02	-18.4	-12.9	-13.3	-11.60
(5.38)	(5.61)	(-0.70)	(-3.06)	(-9.09)	(-13.9)	(-17.03)

$$R^2 = 0.93 \quad D.W = 1.99$$

$$MI_t = a_0 + a_1 Y_t + a_2 R_t + a_3 P_t + Q_1 + Q_2 + Q_3$$

78.01	0.04	0.37	-58.02	6.61	-18.98	-11.53
(4.55)	(3.52)	(3.02)	(-3.84)	(1.73)	(-7.93)	(-7.21)

$$R^2 = 0.90 \quad D.W = 2.03$$

$$MK_t = a_0 + a_1 Y_t + a_2 R_t + a_3 P_t + Q_1 + Q_2 + Q_3$$

34.49	0.05	0.08	-34.25	-0.34	-0.2	-2.86
(5.04)	(11.53)	(1.74)	(-5.61)	(-0.22)	(-0.20)	(-4.39)

$$R^2 = 0.97 \quad D.W = 1.55$$

Note: Values in parentheses are *t*-ratios.

Estimation Method: AR(1) Maximum-likelihood

Appendix 2

Estimates of total and individual import equations

(Log-Linear form)

$$LM_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + a_4M_{t-1} + Q_1 + Q_2 + Q_3$$

-0.16	0.36	0.077	-0.388	0.48	0.14	0.12	-0.04
(-0.53)	(3.76)	(2.166)	(-2.78)	(4.17)	(2.82)	(3.46)	(-1.2)

$$R^2 = 0.91 \quad DW = 2.0$$

Consumer Goods Imports

$$LMC_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + a_4LMC_{t-1} + Q_1 + Q_2 + Q_3$$

-0.25	0.19	0.04	-0.35	0.71	-0.82	-0.13	-0.12
(-0.77)	(2.33)	(1.33)	(-2.58)	(8.00)	(-12.9)	(-3.3)	(-3.7)

$$R^2 = 0.95 \quad DW = 1.73$$

Intermediate Goods (Raw-material) Imports

$$LMI_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + a_4LMI_{t-1} + Q_1 + Q_2 + Q_3$$

0.04	0.10	0.06	-0.40	0.75	-0.19	0.25	-0.27
(0.16)	(1.82)	(1.71)	(-3.45)	(9.68)	(-5.28)	(6.27)	(9.29)

$$R^2 = 0.95 \quad DW = 2.29$$

Capital Goods Imports

$$LMK_t = a_0 + a_1LY_t + a_2LR_t + a_3LP_t + Q_1 + Q_2 + Q_3$$

-1.89	0.81	0.09	-0.99	-0.05	-0.03	-0.0
(-3.37)	(8.02)	(2.02)	(-7.42)	(-1.09)	(-1.06)	(-5.)

$$R^2 = 0.97 \quad DW = 1.68$$

WR_t	Y_t	R_t	P_t
M_t	0.70	0.15	-0.75
MC_t	0.67	0.15	-1.27
MI_t	0.42	0.26	-1.64
MK_t	0.81	0.10	-0.99

Note: Values in parentheses are *t*-ratios

APPENDIX Data Sources:

- (i) International Financial Statistics (various issues)
- (ii) International Monetary Fund (IMF), Balance of Payments Statistics (various issues)
- (iii) Pakistan Economic Survey (various issues)

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