Devaluation and the Balance of Trade in Pakistan: A Policy Analysis

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Devaluation and the Balance of Trade in Pakistan: A Policy Agenda[1]

Shahrukh Rafi Khan

Abstract

Devaluation is frequently recommended as part of structural adjustment programs for attaining external balance. Estimating export and import demand functions is the conventional method of evaluating the likely effect of a devaluation on the external balance. In this paper we address an important critique of the conventional method of estimating export demand functions and make a case for using real effective exchange rates rather than relative prices in the demand functions. We also demonstrate that high income elasticities in the conventional export demand functions need not be cause for concern. Using quarterly data, we find a modified version of a Marshall-Lerner condition barely satisfied for Pakistan, suggesting little or no positive effect on the external balance due to a devaluation. This finding is reinforced by disaggregate export demand functions.

Introduction

Exchange rate flexibility is generally recommended as part of structural adjustment packages to offset balance of trade deficits.[2] However, IMF staff members often claim it is eclectic. For example, if countries confront a chronic current account deficit and inflation is not a serious problem, a market determined exchange rate may be endorsed. Alternatively, if coping with inflation is the priority, a pegged exchange rate could be recommended as a nominal anchor. Problems in the real world rarely come singly. Pakistan has struggled with both price stabilization and current account deficits. It adopted a managed float in 1982 and, as part of its structural adjustment reforms, has occasionally made discretionary changes in the exchange rate when confronted with low foreign exchange reserves, or when the value of the dollar has appreciated substantially in relation to other currencies. The obvious question is whether the evidence supports such policy action. The answer is that the evidence is decidedly mixed.

Goldstein and Khan (1978) suggested that both export demand and supply as well as import demand are considerably responsive to the exchange rate. Their conclusions were based on a study of eight industrialized countries for the 1955-70 period. Hence they claimed that the Marshall-Lerner conditions would easily be satisfied. This result was challenged by Miles (1979), who tested the effects of devaluation on both the trade balance and the balance of payments for a mix of fourteen industrialized and less developed countries in the 1960s.[3] He found that devaluation is primarily a monetary phenomenon that does not affect the trade balance, but does reduce the balance of payments deficit. Balassa et al., (1989) found results similar to Goldstein and Khan for Korea (1965-79) and Greece (1960-78). Rose (1991) rejected the existence of a relationship between the balance of trade and the exchange rate for five major OECD countries using quarterly data for the

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2 Quick et al. (1987) pointed out that out of a total of 106 exchange rate regimes approved by the Fund's executive board between 1983-6, about two-thirds contained elements of exchange rate flexibility.

3 literature. Miles also pointed out that there are several approaches to explaining the association of the balance of trade with the real exchange rate. Apart from the elasticities approach embedded in the Marshall-Lerner conditions, there is an absorption and monetarist approach. Although the transmission mechanisms suggested by these approaches differ, they are observationally equivalent in terms of the reduced form equations estimated. Apart from transmission mechanisms, we have also not addressed the debate on the broader macro-economic effect of devaluations which is reviewed in Saul and Montiel (1989) and Nunnencamp and Schweickert (1990).

1974-1986 period. Hughes and Singh (1991) also provide evidence questioning such an association for both industrialized countries for the 1956-76 period and for selected less developed countries.[4] Using a cointegration approach, Bahmani-Oskooee (1991) identified a long run equilibrium relation between the trade balance and the real effective exchange rate for five out of the eight countries studied for the 1973-88 period.

For Pakistan, Khan and Hasan (1994) used annual data from 1972 to 1991 and estimated import and export demand functions, an export supply function and a price equation using 3SLS. Elasticities were then used to test the Marshall-Lerner condition. As the sum of the export and import demand elasticities exceeded 1, they concluded that the Marshall-Lerner condition was satisfied and that devaluation in Pakistan can improve the trade balance for Pakistan.

Athukorala and Riedel (1991, 1995) have convincingly raised serious methodological doubts about the empirical validity of conventional export demand functions and have suggested an alternative formulation. This represents the point of entry for our conceptual discussion. Our focus is on identifying the implications of their findings for exchange rate policy and testing the resulting hypothesis. We argue that using the real effective exchange rates (EER) in disaggregate export demand functions is preferable for several reasons. First, EER represents the actual control variable used by policy makers to influence relative prices. Second, using EER avoids a major specification flaw that results from the use of relative prices as indicated by Athukorala and Reidel. We also avoid the aggregation problem by estimating separate export demand functions for Pakistan's major exports.

In section two, we explain Pakistan's exchange rate regime. In section three we present a conceptual discussion and our estimation model. Our results are presented in section four, which is followed by a summary and concluding observations.

Pakistan's Exchange Rate Regime[5]

Immediately after Independence, Pakistan's currency was linked to the pound sterling. The Pakistani rupee was devalued for the first time in 1955 during the post-Korean War recession. The second major change in the exchange rate was the devaluation of May 1972, which was precipitated by the oil crisis. The rupee was devalued by over 123 percent, from Rs. 4.92 to Rs. 11.00 to the US dollar. Subsequently, the rate was fixed at Rs. 9.90 to the US dollar, an exchange rate which prevailed for ten years. In January 1982, the appreciation of the US dollar in international markets led the government to adopt a managed float based on a trade-weighted basket of currencies.[6]

As the term "managed float" implies, the State Bank is free to adjust the value of the currency to contend with external imbalance. In particular, the State Bank has occasionally intervened to adjust the value of the rupee whenever the value of the US dollar has appreciated in international markets. However, these have been mild adjustments. In July 1993, however, the rupee was devalued by 3 percent, to Rs. 28.17 to the US dollar, followed by a further devaluation of 6 percent one week later. This last devaluation was carried out as part of the structural adjustment reforms recommended by the IMF for promoting export growth and reducing the trade deficit.[7]

Conceptual Discussion and Estimation Model

4 This study presented evidence in tabular form, whereas all the other studies cited used the regression method.
5 This section relies on data from the Pakistan Economic Surveys.
6 The basket includes the currencies of Pakistan's trading partners.
7 Dorash (1988) presents a detailed account of the movements of Pakistan's nominal and real effective exchange rates.

The conventional export demand as specified by Reidel and Athukorala (1995) is

$$X_d = \varepsilon (P_X - P_W) + \eta Y_W \quad (1)$$

where X_d is export demand, ε is price elasticity, P_x is domestic export price, P_w is export price of competing nations, η is income elasticity and Y_W is the GDP of trading partners. Athukorala and Reidel (AR) convincingly argue that conventional estimates of price and income elasticity defy common sense. First, the low consensus price-elasticities from equation 1 (.5 to 1) suggest an optimal tax, even for small countries, which no one has seriously recommended. Second, for the terms of trade to not turn against an exporting nation, equation 1 implies that the growth in exports should not exceed the growth in world income. AR show that for Hong Kong and Korea (machine and transport equipment) this was not the case, and yet exports did not have an adverse impact on the terms of trade. This was true because in both cases these countries were shown to be price takers. Third, if countries are price takers, equation 1 can be estimated only if there are measurement errors since $P_x/P_w = 1$. This error typically results in an overstatement of η[8] Finally, if a country is a price taker, there is no demand constraint so exports should be modelled on the supply side. Their simple solution is estimating an inverse demand function as follows:

$$P_x = P_w + (1/\varepsilon)X_d + (n/\varepsilon)Y_w \quad (2)$$

If the coefficient of P_w is not significantly different from 1, and if the other two coefficients are not significantly different from zero (suggesting ε to be infinitely elastic), the small country case is confirmed.

The policy implications are far reaching. A price taker confronts only a supply constraint and can promote exports of existing quantities without adversely affecting its terms of trade. The implications for applied research for trade policy are also far reaching. Researchers should begin by testing the small country assumption, preferably by major export commodities.

Applied research seeks to inform policy, and it is best to inform policy makers in terms of the control variables they manipulate. For trade policy, the real effective exchange rate (EER), or the ratio of traded to non-traded goods (P_T/P_{NT}), is the control or policy variable, and so our concern is with the implications of the above findings for the manipulation of the EER. This is of major policy significance since many countries on a fixed or some kind of floating exchange rate regime are often advised to devalue their currency to attain external balance in the context of structural adjustment programs.

The AR results suggest that small countries confront an infinitely elastic demand curve. If the country is a price taker for all goods, the AR results, stretched to the extreme, suggest several possibilities.[9] First, if the EER is above parity, we should observe zero exports for the country. Second, devaluations to the parity levels should show big discontinuous jumps in exports, with the size of the jump dependent on the supply constraint. Third, if the country is at parity, a devaluation would simply result in a loss of export revenue. None of these scenarios is realistic, and they seem to

8 AR also point out that η can be overstated if product diversification in aggregate functions and quality improvements are not accounted for.

9 Bear in mind that policy makers manipulate EERs in an attempt to change export prices relative to non-traded goods and in the process the foreign currency price of domestic exports relative to those of competing nations.

make a mockery of the standard structural adjustment prescription of using devaluation to attain external balance.

In practice, even small countries are likely to confront very high rather than infinite elasticity. Second, there is an aggregation problem since all goods of different price responsiveness are lumped together. Thus it makes sense to estimate disaggregate export demand functions using EER as the price proxy. Policy makers need to know the responsiveness of their major exports to changes in EER. As earlier argued, by using EER, which is not expected to be one, we avoid the specification problem resulting from the use of relative prices in conventional export demand functions. We use quarterly data to estimate aggregate and disaggregate export demand functions specified as follows:

$$log\ X_d = a_0 + a_1\ log\ (EER\ ) + a_2\ log\ GDPG6, \qquad (3)$$

where the coefficients a_1 and a_2 are the "price" and income elasticities of demand and *GDPG6* is an index of the GDP of six industrialized countries which are also among the country's major trading partners.[10]

To estimate equation 2, we start by determining whether EER is exogenous. If exogeneity is ruled out, we estimate export demand and supply within a system of simultaneous equations, using a method first adopted by Goldstein and Khan (1978). Export supply is specified as:

$$log\ X_s = b_0 + b_1\ log\ (EER) + b_2 log\ Y + b_3 W \qquad (4)$$

where X_s is export supply and Y is a capacity variable, which in this case is the trend GDP. W represents a weather dummy since weather affects the production of Pakistan's major primary exports and related manufactured goods. We also specify an equilibrium condition

$$X_d = X_s \qquad (5)$$

Equations (3) and (4) are then solved simultaneously using the instrumental variable approach. We also estimated an aggregate import demand function to identify the likely overall effect of devaluation on the trade balance.

$$log\ M_d = e_0 + e_1\ log\ (EER) + e_2\ log\ GDPP \qquad (6)$$

where M_d is import demand and *GDPP* is Pakistan's GDP.[11]

Results

10 For details on the description of our variables, please refer to the data appendix.

11 A variable to capture the foreign exchange constraint is often used in the import demand function following the structuralist literature. For Pakistan, this ought to be constructed as the sum of remittances, export revenue, and net loan and grant inflows. Quarterly data were not available for these variables. Foreign exchange reserves are often used as a proxy variable. However, these reserves do not actually finance the imports but represent the balance after imports have been financed. We nonetheless used it as a proxy variable but did not find it to be significant. Using annual Pakistani data, aggregate import demand functions have been estimated by Shabbir and Mahmood (1991) to test for structural stability and disaggregate functions by Sarmad and Mahmood (1987).

We start our analysis by testing the small country assumption for Pakistan on an aggregate level by estimating equation 2.

Table 1: Inverse export demand function: testing the small country assumption. (Dependent variable: LP_X)

Regressors	Coefficient	T-stat
INPT	7.88*	3.52
T	0.03*	5.34
LP_W	-0.03	0.60
LX	-0.01	0.49
LGDPG6	0.35	1.35

Notes:
Estimates based on the Cochrane-Orcutt iterative method
* = Significant at the one percent level of significance
T = Time Trend
LGDPG6= Log of GDP of industrialized countries
LX = Log of total exports
LGDPG6= Log of GDP of industrialized countries
LP_W = Unit price of competing nations.
LP_X = Unit price of exports.

The coefficient of LP_W is not equ`al to one as it should be, were Pakistan a small country on an aggregate level. However, the difference of the coefficient of LP_W from one is likely to have resulted from measurement error. As explained in the data appendix, we used a straight average of the unit export price of five competing countries as a very crude proxy for P_W. Data was not available for Pakistan's main competitors such as India and China, nor were we able to follow Balassa et al., (1989) in introducing refinements such as adjusting for export incentives or disaggregating for primary and manufactured goods. However, since the coefficients of LX and LGDPG6 are not significantly different from zero, we do not reject the hypothesis that Pakistan on aggregate confronts an infinite demand elasticity. The implication is that as long as Pakistan's exchange rate is not above parity, one should not expect to see a major response in the trade balance from a currency devaluation.[12]

Estimates of the aggregate export and import demand functions for Pakistan are reported below in Table 2. We had forty-two quarterly observations spanning 1983Q1 to 1993Q3. For the export demand function, we used the Wu-Hausman test to determine if EER was exogenous, rejected the null of no simultaneity, and hence estimated the export demand equation using the instrumental variable method.[13] Also, we used Johansen's estimation to confirm the existence of a cointegrating vector in both cases, which suggest that the equations reported below represent a stable long run association between the variables.[14]

Table 2: Aggregate export and import demand functions

Depen.	Regressors and test statistics

12 One could argue that a gap between the official and free market exchange rate represents a signal for currency misalignment. Based on this, there is little reason to believe that the rupee has been above parity in the last decade.

13 For details of the Wu-Hausman test see Hausman (1978). This test consisted of solving equation (4) for EER. In the second stage, equation (3) is estimated with and without the residuals of the first stage regression. The F-statistic between these two estimations of equation (3) is Wu's T2 statistic. The null-hypothesis of no simultaneity is rejected if the F-statistic is significantly different from zero. This procedure was also adopted for the disaggregate export demand functions reported in Table 3, and in all cases the null of no simultaneity was rejected.

14 We also found this to hold for the equations in Table 1 and Table 3.

var.	INPT	LGDPG6	LGDPP	LFEER	R-BAR-sq	F-Stat	DW
LX	-7.91*	1.63*		-0.32***	0.84	31.10*	1.53
	(2.25)	(6.79)		(1.68)			
LIM	-0.08*		2.13*	0.78*	0.85	37.28*	1.60
	(3.39)		(8.95)	(4.07)			

Notes:
Estimates based on the Cochrane-Orcutt iterative method Parentheses contain t-statistics
* = Significant at the one percent level of significance
*** = Significant at the ten percent level of significance
LGDPG6 = Log of GDP of industrialized countries
LGDPP = Log of Pakistani GDP
LFEER = Log of fitted effective exchange rate
LIM = Log of total imports

The fit of the equations in Table 2 is reasonable, and all the signs are as expected. The coefficient of EER is significant only at the ten percent level, but barring that qualification, the sum of the two coefficients of EER comes to slightly more than one (1.1). This suggests that on an aggregate level Pakistan could expect no change or a minor improvement in its trade balance following a currency devaluation. Since the Marshall-Lerner condition is derived assuming initial trade balance, we re-derived this condition by relaxing this assumption and found it to be as follows:[15]

$$\varepsilon_x X/pM + \varepsilon_m > 1,$$

where ε_x and ε_m are the export and import demand elasticities, X and M are average exports and imports and p is the conversion factor. The left hand side of the modified Marshall-Lerner condition above sums to slightly less than one (since X/pM is less than 1).[16]

To avoid the aggregation problem and to indicate to policy makers the likely impact of devaluation on Pakistan's major exports, we estimated disaggregate export demand functions, which are reported below in Table 3.[17]

There are several points to note in Table 3. Except for raw cotton, for which we also have a poor fit, the income elasticity, when significant, varies between 1.8 and 6.7. One needs to interpret these numbers carefully. An income elasticity of 7 for the carpets exports means that a one percent increase in the GDP of the G6 countries is associated with a seven percent increase in imports of carpets from Pakistan. Since, average real quarterly GDP of the G6 countries was about 7.5 trillion dollars, a one percent increase in GDPG6 represents about 75 billion dollars. Average quarterly carpet exports from Pakistan amount to about 30 million dollars. Thus a 7 percent increase in the exports of carpets from Pakistan represents only about a 0.0003 percent of the increase in GDPG6, which is minuscule. Thus while an income elasticity coefficient of 7 appears very large, viewed in the proper perspective, it can be quite modest. This explanation is necessary in view of the attention high income elasticity coefficients have been given in the literature.

15 For details of this derivation see Khan and Aftab (1995).
16 In rupees, average exports and imports are 12.72 billion and 14.43 billion respectively.
17 The major exports represent about two-thirds of total exports in both the beginning and end quarters of our data. We selected the commodities by using Rs. one hundred million as the cut off value for third quarter of 1993. Results for rice are not reported since the equation had no explanatory power as indicated by the F-test.

Table 3: Export demand functions using the IV method.
(Dependent variable: LX)

Depen.	Regressors and Test Statistics						
Var.	INPT	T	LGDPG6	LFEER	R-Bar-sq	F-stat	DW
LXRC@	-446.94* (-2.68)	-0.49* (2.87)	39.38* (2.75)	2.83 (1.28)	0.32	3.33*	2.10
LXF@	-24.33 (0.35)		2.70 (0.59)	-0.29 (0.49)	0.47	5.92*	1.37
LXCY	-6.53 (0.53)		1.80* (2.60)	-1.60* (2.97)	0.90	174.90*	1.9
LXTL	50.12* (7.83)		-2.73* (6.76)	-2.88* (8.51)	0.75	56.48*	2.24
LXMOL	-5.07 (0.21)		1.07 (0.64)	-0.64 (0.50)	0.25	7.27*	2.09
LXCC	-25.40* (3.67)		2.74* (5.77)	0.27 (0.75)	0.89	147.77*	2.09
LXOC#	-5.44 (0.19)		1.87* (2.98)	-2.33 (1.43)			
LXC@	-56.66 (1.45)	-0.13* (-3.05)	6.70** (1.98)	-2.61* (6.53)	0.71	12.80*	2.04
LXML	-29.50* (4.05)		3.41* (7.05)	-0.86** (2.08)	0.96	492.98*	2.06
LXSG@	-14.06 (1.06)		2.13** (2.22)	-0.97 (1.14)	0.73	16.41*	2.07
LXMED#	-3.28* (4.03)		2.33* (5.96)	0.37*** (1.19)			

Notes:

@	=	Estimates based on the Cochrane-Orcutt iterative method
#	=	Newey-White (Parzan weights) heteroscedasticity and autocorrelation consistent estimators
LXRC	=	Log of exports of raw cotton
LXF	=	Log of exports of fish
LXCY	=	Log of exports of cotton yarn
LXTL	=	Log of exports of tanned leather
LXMOL	=	Log of exports of molasses
LXCC	=	Log of exports of cotton textiles
LXOC	=	Log of exports of other textiles
LXC	=	Log of exports of carpets
LXML	=	Log of exports of manufactured leather
LXSG	=	Log of exports of sports goods
LXMED	=	Log of exports of medical equipment

Our real concern is with the responsiveness of Pakistan's major exports to a change in the exchange rate. An increase in the EER index represents an appreciation of the currency. For five out of the twelve major exports considered, we have a significant negative association of an exchange rate appreciation with the corresponding exports. The coefficient is close to one (not significantly so) in one case (.86) and considerably greater in the other three (1.60, 2.61 and 2.88). This indicates a considerable response in exports and is likely in three out of the twelve cases. However, on average, these exports represent about one-third of the export value for twelve major exports we selected and about a fifth of total export value. In view of these findings and the aggregate results reported in Table 2, one can assert that there is little empirical support for Pakistan's attempt to increase exports by devaluing its currency.[18]

18 It appears that there was little reason for the big devaluation in 1993 since the gap between the official and free market exchange rate prior to the devaluation was small and this gap was not affected by the devaluation.

Summary and Conclusion

Most structural adjustment programs require flexibility in the exchange rate. Typically, the reason for urging this flexibility is to redress balance of trade deficits. One method used in the literature to assess this recommendation is to test the Marshall-Lerner condition. This entails estimating export and import demand functions and checking to see if the sum of the price elasticity of exports and imports is greater than one. If the condition is satisfied, the inference is that the balance of trade is likely to respond positively to a devaluation or depreciation of the currency.

Recently, conventional export demand functions have been criticized in the literature for ignoring the likelihood of countries being small with regards to their exports. Small countries face an infinite demand elasticity, and conventional estimates suffer from specification bias since the relative price ratio should be one. We argue that it is still possible to use conventional export demand functions by using the real effective exchange rate as a proxy for relative prices. This may also be preferable since the real effective exchange rate represents the actual control variable policy makers use in trying to influence the external balance. We also demonstrate why high income elasticities need not be of great concern.

We jointly estimated an export demand function with an export supply function using an instrumental variable approach and also an import demand function. We found that the Marshall-Lerner condition is barely satisfied for Pakistan since the sum of import and export demand elasticities is only slightly greater than one. Also, the Marhsall-Lerner condition assumes an initial trade balance, and we re-derived the Marshall-Lerner condition by relaxing this assumption. We find that the modified Marshall-Lerner condition is not satisfied by a very small margin. Thus past experience suggests that Pakistan can expect little or no change in its trade balance by devaluing its currency.

We believe that our findings are consistent with Athukorala and Reidel (AR). Evidence suggests that Pakistan's currency has been close to parity since there has been little difference between the official and free market exchange rate. Under such circumstances, the AR findings suggest that there is little reason to expect a major change in the trade balance following a devaluation since, on aggregate, Pakistan does satisfy the small country assumption.

To address the aggregation problem and to ascertain the likely effect of a devaluation on Pakistan's major exports, we estimated disaggregate export demand functions. We found that only one-third of Pakistan's major exports are likely to respond positively to a devaluation. These findings reinforce the results from the aggregate export demand function.

Given the scant evidence that devaluation improves the trade balance, there is reason for caution. Devaluation could result in inflation since imports are more expensive. Also, for devaluation to work, the government must repress wages, or the competitive advantage devaluation gives to exports will be eroded. Society must judge if this distribution of income (away from low income workers to export industrialists and agriculturists) is fair. Finally, scholars have argued that devaluation retards growth due to higher costs of production. These are complicated issues we have not explored but note as related research issues.

The caution of Pakistani economic managers has often served the country well. Our findings here suggest that, based on past experience, they should not expect a major improvement of the trade balance with large currency devaluations such as the one adopted in the summer of 1993. Capital

market and other compulsions may still require maintaining a market determined exchange rate. However, the evidence reported in this paper suggests that policy makers should use caution and the wealth of their own experience.

References

Athukorala, P. and J. Riedel. 1991. The Small Country Assumption: A Reassessment with Evidence from Korea. *Weltwirtschaftliches* 127 (1): 138-151.

Bahmani-Oskooee, M. 1991. Is There a Long-Run Relation Between the Trade Balance and the Real Effective Exchange Rate of LDCs? *Economic Letters* 36: 403-407.

Balassa, B., E. Voloudakis, P. Fylaktos and S. T. Suh., 1989, The Determinants of Export Supply and Export Demand in Two Developing Countries: Greece and Korea. *International Economic Journal* 3 (1): 1-16.

Dorash, P. 1988. Exchange Rates and Trade Effects on Relative Prices in Pakistan. Draft Working Paper, IFPRI.

Goldstein, M. and M. S. Khan. 1978. The Supply and Demand for Exports: A Simultaneous Approach. *The Review of Economics and Statistics* (May): 275-286.

Government of Pakistan, Economic Affairs Division. *Pakistan Economic Survey.* Various issues.

Government of Pakistan, Federal Bureau of Statistics, *Monthly Statistical Bulletin,* Various Issues.

Hausman, J. A. 1978. Specification tests in Econometrics. *Econometrica* 46 (6) (November): 1251-1271.

Hughes, A. and A. Singh. 1991. Consequences of the World Economic Slowdown and the Asian and Latin American Economies: A Comparative Analysis of Economic Structure, Policy and Performance. In *Economic Liberalization: No Panacea,* ed. Tariq Banuri. Oxford: Oxford University Press.

Khan, A. H. and A. Hasan. 1994. *Impact of Devaluation on Pakistan's External Trade: An Econometric Approach*. Pakistan Society of Development Economists, Tenth Annual General Meeting, Pakistan Institute of Development Economics. Islamabad.

Khan, A. H. and B. Reza. 1989. The Demand for Money in Pakistan: Quarterly Results 1972 -1987. *Pakistan Economic and Social Review* 27 (1).

Khan, S. R. and S. Aftab. 1994. A Modified Marshall-Lerner Condition. (mimeo).

Miles, M. 1979. The Effects of Devaluation on the Trade Balance and the Balance of Payments: Some New Results. *Journal of Political Economy* 87 (3): 600-620.

Nunnencamp, P. and R. Schweickert. 1990. Adjustment Policies and Economic Growth in Developing Countries: Is Devaluation Contractionary? *Weltwirtschaftliches* 126 (3).

Quick, P. J., B. V. Christensen, K. Huh and T. Sasaki. 1987. Floating Exchange Rates in Developing Countries: Experience with Auction and Interbank Markets. *IMF Occasional Papers* No. 53.

Riedel, J. and P. Athukorala. 1995. Export Growth and the Terms of Trade: The Case of Curious Elasticities. In *North South Linkages and International Macroeconomic Policy*, eds. D. Vines and D. Currie. Cambridge: Cambridge University Press.

Rose, A. K. 1991. The Role of Exchange Rates in a Popular Model of International Trade: Does the Marshall-Lerner Condition Hold? *Journal of International Economics* 30: 301-316.

Sarmad, K. and R. Mahmood. 1987. Disaggregated Import Demand Functions for Pakistan. *Pakistan Development Review* 26 (1): 71- 80.

Saul, L .J. and P. J. Montiel. 1989. Contractionary Devaluation in Developing Countries: An Analytical Overview. *IMF Staff Papers* 36(1): 182-287.

Shabbir, T. and R. Mahmood. 1991. Structural Change in the Import Demand Function for Pakistan. *Pakistan Development Review* 30 (4): 1168.

Appendix

Data

Data on value added of exports, imports and the unit value of exports were obtained from Pakistan's *Monthly Statistical Bulletin*s and converted into quarterly form.

Since quarterly data on GDP are not available for Pakistan, annual data from the *Pakistan Economic Survey* was converted into quarterly data according to the technique described in Khan and Reza (1989).

The data on GDP of the six industrialized countries were obtained from the monthly issues of the IMF's *International Financial Statistics* and was converted into US dollars with data on exchange rates from the same source. The six countries included in the index are Canada, France, Germany, Italy, the United States and Japan. These countries account for 37.2 percent of total exports from Pakistan. For other major importers from Pakistan, quarterly data were not available. However, in the annual data, the correlation of exports to the G6 countries and total Pakistani exports was .99.

The index of the unit value of exports for competitors was constructed with data from *International Financial Statistics*. The countries for which data could be obtained were Bangladesh, Malaysia, Indonesia, Thailand and Egypt. The most glaring country omissions are India and China, but these countries do not publish quarterly data on export unit value indices. Also, we used straight averages rather than weighted averages. If quarterly trade data by country and commodity were available, a much more finely calibrated price variable of competing countries could be constructed.

The data series for the real effective exchange rate was obtained from *International Financial Statistics* and the IMF Information Notice System. The exchange rate is calculated against a basket of currencies which includes the currencies of trading partners for both exports and imports, excluding oil trade partners.