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IMPACT OF EXCHANGE RATE ON IMPORT DEMAND IN PAKISTAN

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The impact of income, real exchange rate, imports prices and foreign exchange reserves on import demand in Pakistan for the period 1980 to 2008, is addressed in this paper. Income turned out to be the most important factor in determining the import demand in the traditional econometrics methodology. Long-run relationship exist between imports and real effective exchange rate. There is a uni-directional causality from imports to income and from foreign exchange reserves to imports, and bi-directional causality between import prices and imports. Pakistan's economy suffers from prominent and perplexing macroeconomic imbalances. Adherence to fiscal discipline is expected to ease macroeconomic malaise in the country.

I. Introduction

Imports contribute to all components of GDP in any economy. A country imports certain goods or services because they does not exist within its boundaries at a specific level or quality; they are cheaper abroad as producers there are more efficient, face lower costs, better exploitation of economies of scale and acceptance of lower profits. For financing imports a country must rely on its exports, foreign credit, foreign direct investments and foreign aid. Imports impact the trade balance, may displace domestic production leading to fall in employment. By taxing imports, government can increase its revenue. Heavy taxation of imports may discourage domestic producers to adopt new technologies and improve their organizational models, and may thus make the country less competitive in world markets.

Thus, imports are important ingredient of the foreign trade of a country. In Pakistan, import has outperformed the exports culminating in high trade deficit. During 2000s exports, imports and trade deficit growth rates were 11.7 per cent, 18.36 per cent and 69.56 per cent, respectively, [GOP (2007-08)]. Therefore, a

serious effort to examine the performance of imports which have substantial impact on the economy assumes great importance. The purpose of the paper is to address empirically the response of imports to exchange rate, foreign exchange reserves, income, import prices and liberalization. These are the potential factors which influence the performance of imports. Most studies on Pakistan's imports [Khan (1974), Naqvi et al., (1983), Sarmad and Mahmood (1985), Afzal (2001), Afzal and Zahid (2004), Afzal (2006)], have not examined the response of imports to exchange rate, foreign exchange reserves, and liberalization. The exception is Hasan and Khan (1994). All these studies have used traditional regression analysis which assumes that the data is stationary. The development of modern time-series methods cast doubts on traditional methods of estimation. The advent of new econometrics methods have necessitated that old theories and methodologies are given renewed attention. We investigate the time series properties of the data in order to ascertain the long-run relationship as well as causality between imports and the aforementioned variables.

II. Review of Literature

Numerous empirical studies have been undertaken on the import behaviour in the context of both developed and developing countries [Houthakker and Magee (1969), Leamer and Stern (1970), Khan (1974), Murray and Ginman (1976), Khan and Ross (1975) and (1977)]. These early studies have examined relationship between the imports, import prices and other allied variables.

Houthakker and Magee (1969) estimated the income and price elasticities for a number of developed countries. The results show that even if their production and prices increased at the same rate, the trade balance improvement or deterioration in some countries was influenced by disparities in income elasticities of their demand for imports. Khan (1974) examined the imports and exports of 15 developing countries, including Pakistan. Most of the countries in his sample are Latin American countries. He used the traditional form of import demand function expressing import demand as a function of income and import prices. Murray and Ginman (1976) state that the traditional form of the import demand makes the coefficients equal in magnitude but opposite in sign to import price and domestic price indices. They applied the above-suggested form to Canada for the period 1950-64. To study the link from income to trade, Khan and Ross (1975), Dunlevy (1980), and Haynes and Stone (1983) emphasised the decomposition of income into trend and deviation from trend to separate secular and business cycle components. Magee (1975) provided an influential motivation for this decomposition, arguing that trade flows respond differently to secular and business cycle income changes and that regression estimates with income in level form combine these effects. Haynes and Stone (1983), pointed out some problems for the said decomposition and suggested the use of

spectral analysis; but the spectral analysis also suffers from problems [Arize (1991)].

Carone et al., (1996) found a statistically significant long-run relationship between the import demand function and real income and relative prices in USA (1970-1992) based on the cointegration and error correction approaches. Reinhart (1995) estimated structural import demand functions for 12 developing countries and reported that income elasticity of imports of the sample developing nations is lower than those for developed countries. Similarly, Senhadji (1998), using cointegration and the fully modified ordinary least squares estimator estimated structural import demand function for 77 countries. Short-run and long-run price and income elasticities of structural import demand functions differed and were -0.26 and 0.45, and -1.08 and 1.45, respectively. Santos-Paulino and Thirlwall (2004) examined the impact of trade liberalization on exports, imports and the balance of payments for 22 developing countries. They found that the impact of trade liberalization on import growth was greater than on export growth and the price elasticity of demand for imports exceeded exports. They concluded that the balance of trade deteriorated after trade liberalization.

Mah (1999) examined the trade liberalization experience of Thailand for the period 1963 to 1992. He used the traditional import demand functions with import demand a function of domestic real income and relative prices and concluded that income elasticities increased after trade liberalization. Lopez (2005) examined the effects of trade liberalization on imports for the Mexican economy covering the period 1973 to 2000. To examine the long-run relationship between imports and its determinants he used ARDL (Autoregressive Distributed Lag) model and reported that the price and income elasticities of the imports demand were significant and trade liberalization positively impacted import growth. Mehta and Parikh (2005) examined the impact of trade liberalization on the Indian economy, over the period 1993 to 1997 and reported that trade liberalization increased price elasticities when tariffs were reduced.

Many developing countries facing persistent balance of payment (BoPs) deficits have used exchange rate policy to regulate trade and capital movements. These countries have relatively high import and low export elasticities. Imports have grown faster than exports culminating in unsustainable trade deficits. The responsiveness of trade balance to exchange rate has been examined extensively in the literature [Bird (1983), Rana (1983), McKenzie (1999), Bayoumi (1996), Mussa et al., (2000), and Tavlas (2003). Bird (1983) identified three factors – severe BoPs deficits since 1973–1974, adverse movements in developing countries' terms of trade, devaluation debate between developing countries and the IMF – that have contributed to the importance of exchange rate policy in the developing countries. Tavlas (2003) reviewed the issues of exchange rate, mainly the types of exchange rate regimes. Mussa et al., (1994) pointed out that exchange rate misalignment issues figure prominently in exchange rate literature. Real exchange rate shows the prices abroad

relative to those at home; reflecting the role of household's behaviour, production function of the firms, fiscal policy and institutional structures [Whalley (1985)].

Hooper and Kohlhagen (1978) pioneered a systematic analysis of the effects of exchange rate uncertainty on developed countries trade for the period 1965 to 1975. They showed that there is a clear negative relation between, exchange rate volatility and the volume of trade, but the effect on prices is ambiguous depending on response of the importers or exporters who bear the risk. Bahmani-Oskooee (1986) found that exchange rate has a significant impact on trade flows of selected developing countries, even in periods when most of them had fixed exchange rates.

The most detailed study in context of developing countries was undertaken by Rana (1983). He estimated the import demand function for his sample countries and concluded that the increase in exchange rate risk has a significant negative impact on import volumes. McKenzie (1999) noted that the consequences of exchange rate volatility on trade have long been a matter for concern, and highly debated among the economists. However, there is no consensus on whether the exchange rate volatility matters and whether trade benefits or adversely reacts to currency fluctuations..

Naqvi et al., (1983) studied the demand for consumer, intermediate and capital goods imports in Pakistan for the period 1959-60 to 1978-89, while the demand for services has been treated as exogenous. Sarmad and Mahmood (1985) estimated import elasticities at a disaggregated level for the period 1969 to 80. They also obtained price and income elasticities for aggregate imports and reported mixed results for them. It is difficult to draw valid policy implications from these results. Using simultaneous equation approach, Afzal (2001) reported price and income elasticities as -0.35 and 0.55 for Pakistan for the period 1960-99. Income is the most significant variable influencing import behaviour in Pakistan.

Afzal and Zahid (2004) examined Murray and Ginman (1976) suggestions and concluded that the real domestic income is the major determinant of import demand and price separation format does not hold for Pakistan. Afzal (2006) has estimated import demand functions in static and dynamic forms for Pakistan for aggregate imports as well as capital goods, consumer goods and industrial raw material imports that include both capital and consumer goods imports. He reported significant import price coefficient for consumer and capital goods import. The overall conclusion is that income is the major driving force of import demand for all groups of imports.

III. Methodology and Data

A number of factors determine imports including - level and dynamics of domestic income and GDP components (investment, consumption, public expenditure, exports), price competitiveness of domestic production, (normally influenced by ex-

change rate level and fluctuations as well as by inflation differentials between the country and foreign nations); non-price competitiveness of domestic production; national attitude toward foreign goods, etc. Similarly, imports are expected to grow if families' disposable income increases, inflation abroad is lower than the domestic inflation, so that foreign products become cheaper, there are changes in domestic supply and demand conditions etc.

The above analysis reveals that there are multiple factors that are likely to influence imports. To translate the behaviour and response of imports demand as well as supply into a functional form, two considerations need attention. First, is the specification of factors which are supposed to influence the import demand and supply significantly. It is difficult to identify and quantify all these factors, therefore choice of the most important factors becomes imperative and binding. Second, is the specification of the functional form to be used for estimation purposes. It has been assumed in the international trade literature that the world supply of imports to a single country is infinite. This assumption appears to be conceivable as most countries have small open economies that are price takers. Therefore, most of the studies undertaken were on import demand, with few exceptions [for example, see Khan (1974), Haynes and Stone (1983), Arize (1986), Afzal (2001)]. We therefore limit our analysis to import demand and its response to important factors and the functional form used in our analysis.

Linear and log-linear forms of the import demand have been used in the literature. Leamer and Stern (1970) argue that the use of linear or log-linear form may be looked as testing the significance of a particular functional form rather than significance of the particular explanatory variables. Khan and Ross (1977) established that log-linear specification was better than a linear one for import demand. Sarmad (1989) favours the log-linear form for the aggregate import demand equation as it is based on experience of a large number of countries.

Following the literature [Khan (1974), Bahmani-Oskooee (1986), Afzal (2001), Hasan and Khan (1994)] the functional form of import demand used is a log-linear specification as follows:

$$\ln M_d = \alpha_0 + \alpha_1 \ln (PM / WPI) + \alpha_2 \ln Y + \alpha_3 \ln REER + \alpha_4 \ln FER \quad (1)$$

$$\ln M_d = \alpha_0 + \alpha_1 \ln (PM / WPI) + \alpha_2 \ln Y +$$

$$\alpha_3 \ln REER + \alpha_4 \ln FER + \alpha 5\ D0 \quad (2)$$

Where:

ln = natural logarithm,

M_d = real value of imports demand,

Y = real GDP of Pakistan,

PM = unit value of imports of Pakistan,
WPI = wholesale price index of Pakistan, REER,
= real effective exchange rate,
FER = foreign exchange reserves,
Do = zero for 1980 to 1990 (pre-liberalization) = one for 1991 to 2008 (post-liberalization).

'Do' is the liberalization dummy. Pakistan started trade liberalization program in the early 1990s.In the previous decades, Pakistan's economy remained heavily regulated and protected.

Increase in domestic income is expected to increase imports and thus the coefficient of y is expected to be positive. Inflation is most likely to discourage import demand and thus the expected price coefficient is negative. Similarly, increase in exchange rate will reduce the import demand and the coefficient of real effective exchange rate will be negative. Foreign exchange reserves are supposed to have a positive coefficient because holding of these is necessary for exchange rate stability that in turn will have encouraging impact on imports. Therefore, expected signs of the coefficients in equations (1) and (2) are $\alpha_1 < o$, $\alpha_2 > o$, $\alpha_3 < o$, $\alpha_4 > o$ and the sign of α_5 the coefficient of 'Do' is uncertain as it is difficult to say with certainty whether the effects of liberalization are positive or negative.[1]

Unit Roots, Cointegration and Causality

Traditional econometrics is based on the assumption that data is stationary i.e., the underlying variables have constant mean and variance. However, this assumption does not hold water when we use long period time series data. Therefore, time series properties of the data must be examined before doing any empirical work. For this purpose the unit roots test are used to check the stationarity and nonstationarity which are termed integrated of order zero and integrated of order one denoted as I(0) and I(1), respectively. To determine the order of integration we use ADF (Augmented Dickey-Fuller) and PP (Phillips-Perron) tests. If the variables under consideration are nonstationarity, then the long-run relationship between the variables known as cointegration is explored. Cointegration methodology suggested by Johansen (1991) and (1995) is preferred to Engle and Granger (1987) methodology in the literature.

[1] Annual data on all the above-mentioned variables from 1980 -2007 was obtained from the IMF International Financial Statistics (IFS), and the last year data were collected from the Government of Pakistan (GOP), Economic Survey 2007-08. Real value of GDP (Y) and real value of imports were obtained by deflating the series by CPI and unit value of imports. Foreign exchange reserves are in million US dollars.

IV. Estimation Results

The OLS results of equations (1) and (2) are given below:

$$\ln M_d = \underset{(2.87)}{5.23} - \underset{(-1.50)}{0.38} \ln (PM / WPI) + \underset{(4.03)}{0.84} \ln Y + \underset{(0.64)}{0.02} \ln FER - \underset{(-0.57)}{0.16} \ln REER \quad (3)$$

$R^2 = 0.93$ DW = 1.45

LM(1) = 3.45, (06) HS = 0.79, (0.61) FF(2) = 1.001; (0.39) JB = 0.44 (0.80)

$$\ln M_d = \underset{(2.75)}{4.97} + \underset{(-1.22)}{-0.31} \ln (PM/WPI) + \underset{(3.77)}{0.78} \ln Y + \quad (4)$$

$$\underset{(0.83)}{0.03} \ln FER + \underset{(0.87)}{0.25} \ln REER + \underset{(1.28)}{0.12} Do$$

$R^2 = 0.94$ DW = 1.47

LM(1) = 3.37, (0.08) HS = 0.63, (0.75) FF(2) = 1.02, (0.39) JB = 0.62 (0.72)

Note: In equation (3) figures in parentheses are t-statistic. *Stands for 5 per cent level of significance in equation (3) and (4). For diagnostic and specification tests figures within parentheses are t-statistic.

Equation (4) differs from equation (3) by the dummy variable. To see the statistical appropriateness of the equations, we apply diagnostic and specification tests. Ramsey (1969) has proposed a general test of specification errors called RESET (FF). White (1980) test is for heteroscedasticity as well as specification (HS). The Jarque-Bera (1987) statistic (JB) tests whether a series is normally distributed and Breusch- Godfrey LM test is for serial correlation.[2]

LM test for serial correlation is rejected at the marginal significance limit (msl) of 6 per cent and 8 per cent, respectively, in the two equations. HS, FF and JB tests are acceptable in their F-test version as we see no significant msl for the three tests. These are 75 per cent, 39 per cent and 72 per cent, respectively. Therefore, diagnostic test statistics are satisfactory. Liberalisation dummy has a positive and insignificant coefficient. Liberalisation and exchange rate dynamics does not have noteworthy

[2] For details, see Hamilton (1994) and Patterson (2000).

impact on import demand, suggesting that Pakistan's economy has relatively inelastic import demand.

Price and income variables coefficients in the estimation results of both equations have correct signs. Foreign exchange reserves and real effective exchange rate have insignificant coefficients. Income is the most important determinant of import demand in Pakistan. Hasan and Khan (1994) also reported an insignificant coefficient for FER for their disaggregated import demand functions for the period 1972 to 1979. Foreign exchange reserves and exchange rate have an impact on import demand as shown by their positive coefficients. This is supported by the country's experience. Pakistan's industry has remained heavily dependent on imports [Kemal (1998)] regardless of foreign exchange reserves and exchange rate positions. Trade deficit reached unprecedented proportion of $14 billion in 2007-08 and import bill of $12.9 raised current deficit to $5.9 billion, during July–October 2008-09, despite workers' remittances and exports of $2.3 billion and $7.1 billion, respectively [State Bank of Pakistan (2008b)]. Figure-1 (a) to (d) also provide an evidence of this scenario.

Imports and reserves[3] demonstrate that up to 2002 imports exceeded the reserves. Reserves started to rise after 9/11 event and began to fall after 2007. Imports and real effective exchange rate figure[4] show that imports outstripped the exchange rate over the sample period (1980 to 2008). Real exchange rate has been depreciating quite visibly and noticeably. Import prices are closely linked[5] with exchange rate and world supply conditions indicate almost a constant trend. Income and import figure[6] point out that income had a steady increase vis-à-vis imports and the empirical result show its dominant impact on imports, turning out to be the principal determinant.

Despite the fact that diagnostic and specification tests support the statistical soundness of the models, there is still the problem of autocorrelation. A drawback of the DW statistic is that if it falls in the indecisive zone, it is difficult to conclude whether serial correlation is present. Q-statistic and the Breusch-Godfrey LM test are preferred in most applications. We use the LM test which is not only statistically more powerful in large samples but also in finite or small sample [Gujarati and Sangeetha (2007)]. We used lag 1 for LM test based on AIC (Akaike Information Criteria) and SIC (Schwarz Information Criteria). Since the DW falls in the indecisive zone in the above equation, we used LM test which is slightly significant casting doubts on the reliability of results. Therefore, the results should be interpreted with care.

[3] see, Figure-1 (a).
[4] see, Figure-1 (b).
[5] see, Figure-1 (c).
[6] see, Figure-1 (d).

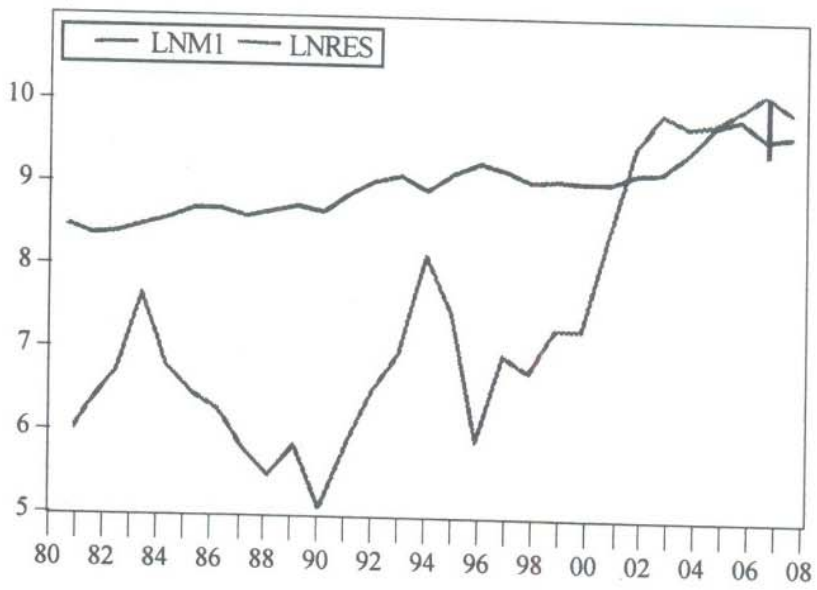

Figure 1(a)

Imports – Reserves

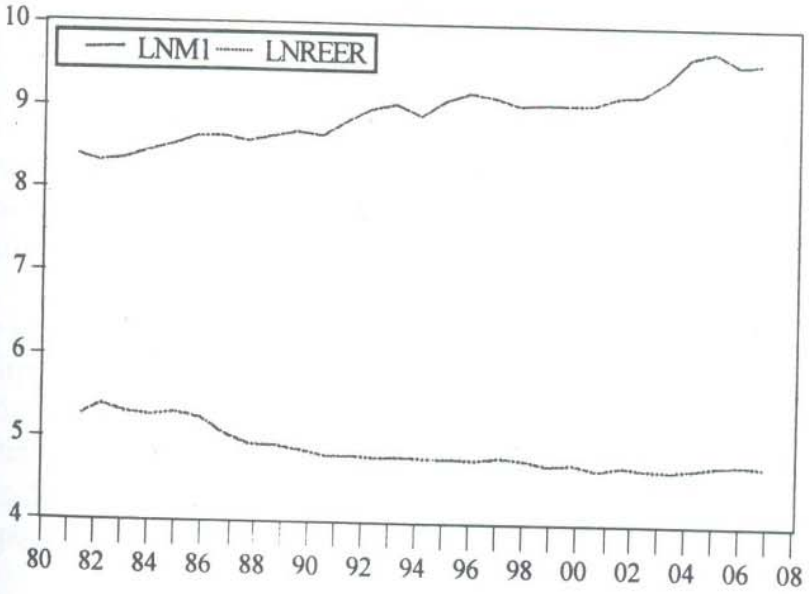

Figure 1(b)

Imports – REER

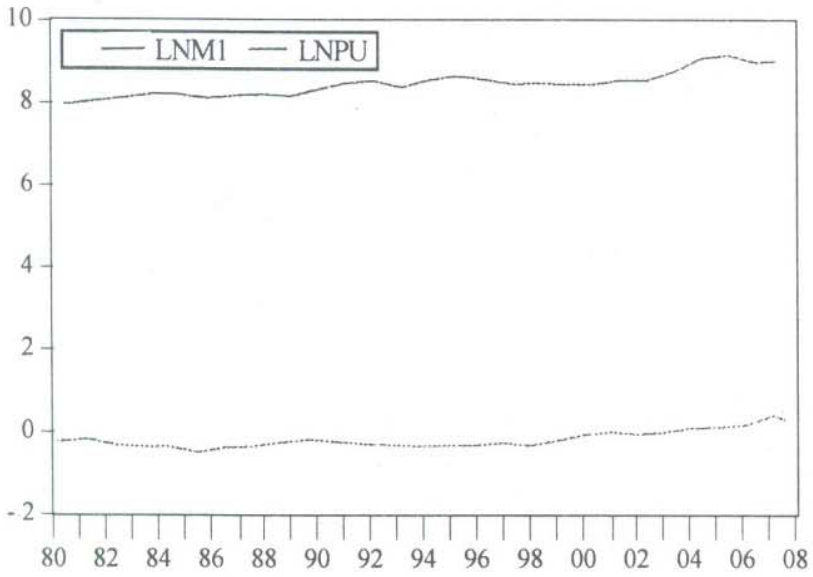

Figure 1(c)

Imports – Prices

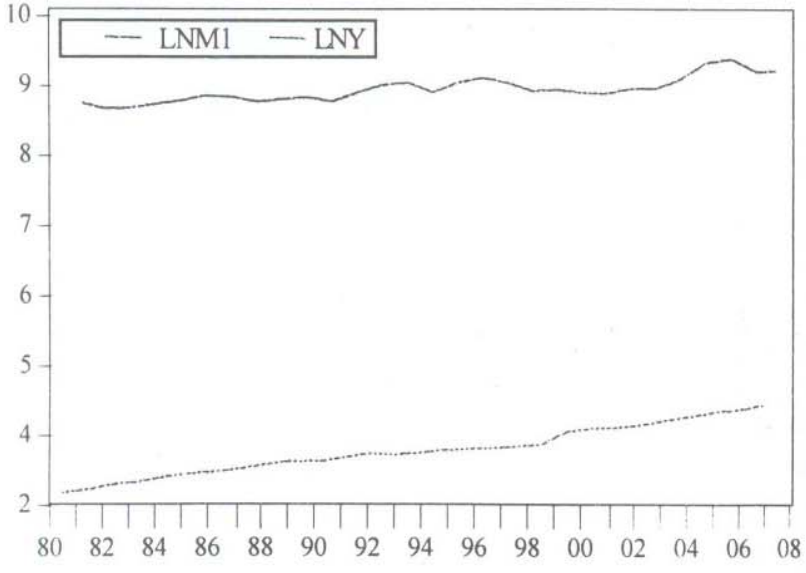

Figure 1(d)

Imports – Income

V. Unit Roots

To determine the order of integration the ADF (Augmented Dickey-Fuller) and the PP Phillips-Perron) tests is used, (see Table 1). The null hypothesis is $H_0: \gamma = 0$, (where, $\gamma = \rho - 1$, if $\gamma = 0$, then $\rho = 1$), the time series is nonstationary and the alternative hypothesis is that γ is less than zero implying the time series is stationary. The estimated t-value of the coefficient of y_{t-1} ($\Delta y_t = \beta_0 + \beta_{1t} + \gamma y_{t-1} + \varepsilon_t$) obtained by using OLS follows the τ (tau) statistic. If the computed $|\tau| <$ MacKinnon critical τ values, then we do not reject the null hypothesis and the given time series is nonstationary or is integrated of order one or I(I) in Engle and Granger (1987) terminology. But if $|\tau|$ exceeds the MacKinnon critical τ value, we accept the alternative hypothesis that the time series is stationary. A time series is integrated of order one if it becomes stationary after it has been differenced one time. Now, if Ho : $\gamma = 0$ is rejected, then first difference stationarity is confirmed which means that the original time series is integrated of order one [Gujarati and Sangeetha (2007)]. Results for unit roots show that except for Y in both tests for without trend, rest of the values satisfy the above-mentioned standard.

Since the variables are nonstationary and integrated of order 1, we apply the Johansen Cointegration Test to see whether the variables are cointegrated or not suggesting long-run relationship. To apply this test it is imperative to determine the optimal lag length. We used FPE (Final Prediction Rrror), AIC (Akaike Information Criterion), and SC (Schwarz Criterion] Criteria to determine the lag length and these criteria supported lag 1 as the optimal lag order for VAR. The Johansen cointegration results are shown in Tables 2. The null hypothesis of no cointegration ($H_0: r = 0$) is rejected by the trace test suggesting long-run relationship between imports and other variables. To see how the individual variables are related with imports, we apply Johansen Cointegration Test to explore the said aspect. The results given in Table 3 indicate one cointegrating equation between imports and the real effective exchange rate, while other variables are not cointegrated with imports.

Since imports and real effective exchange rates are cointegrated, a broader test of causality known as an Error-Correction (ECM) Model is adopted. The ECM restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing a wide range of short-run dynamics. The error correction term is called the cointegrating term because the deviation from long-run equilibrium is corrected gradually, through a series of short-run adjustments.

Based on Engle and Granger (1987)[7] representation theorem, the error-correction model for imports and real effective exchange rate is formulated as follows:

[7] Engle and Granger, (1987), p. 255.

TABLE 1

Unit Root Tests

	ADF				PP			
	level		first difference		level		first difference	
	without trend	with trend	without trend	with trend	without trend	with trend	without trend	with trend
M	-0.49	-3.44	-4.95	-4.87	-0.20	-2.69	-5.51	5.26
	(0.87)	(0.06)	(0.0005)	(0.003)	(0.92)	(0.24)	(0.000)	-(0.0012)
PM	-0.33	-3.38	-5.48	-5.35	-0.28	-3.004	-6.02	-5.78
	(0.90)	(0.07)	(0.0001)	(0.001)	(0.91)	(0.15)	(0.000)	(0.0003)
WPI	-0.80	-1.04	-4.12	-4.01	-0.72	-1.42	-4.15	-4.02
	(0.80)	(0.92)	(0.0038)	(0.02)	(0.82)	(0.87)	(0.004)	(0.02)
PM/WPI	-1.22	-2.35	-5.97	-5.93	-1.08	-2.51	-5.97	-5.92
	(0.64)	(0.30)	(0.000)	(0.000)	(0.70)	(0.32)	(0.000)	(0.0002)
REER	-1.44	-0.91	-5.21	-6.19	-1.45	-0.95	-5.21	-6.61
	(0.54)	(0.94)	(0.0002)	(0.0001)	(0.54)	(0.93)	(0.000)	(0.000)
RESERVES	-0.74	-1.83	-4.98	-4.97	-0.78	-1.83	-4.98	-4.96
	(0.82)	(0.65)	(0.0004)	(0.002)	(0.80)	(0.65)	(0.000)	(0.0024)
Y	0.23	-4.94	-4.94	-4.86	0.34	-1.70	-4.94	-4.87
	(0.96)	(0.0005)	(0.005)	(0.003)	(0.97)	(0.72)	(0.000)	(0.0024)

Note: critical values for rejection of hypothesis of a unit root for both ADF and PP tests for 1 per cent, 5 per cent, and 10 per cent, respectively, are: -3.68, -2.97 and -2.62, for without trend and -4.33, -3.58, and -3.22, for with trend and the figures in parentheses are MacKinnon (1996) one-sided p-values.

TABLE 2

Multivariate Case
Johansen Test Results

Hypothesis	λ-max	95%CV	Hypothesis	λ-trace	95%CV
$H_0: r = 0$			$H_0: r = 0$		
$H_1: r = 1$	31.31	34.81	$H_1: r \geq 1$	78.09	76.97
$H_0: r \leq 1$			$H_0: r \leq 1$		
$H_1: r = 2$	22.75	28.58	$H_1: r \geq 2$	46.77	54.07
$H_0: r \leq 2$			$H_0: r \leq 2$		
$H_1: r = 3$	13.87	22.29	$H_1: r \geq 3$	24.02	35.19
$H_0: r \leq 3$			$H_0: r \leq 3$		
$H_1: r = 4$	5.49	15.89	$H_1: r \geq 4$	10.15	20.26
$H_0: r \leq 4$			$H_0: r \leq 4$		
$H_1: r = 5$	4.66	9.16	$H_1: r \geq 5$	4.66	9.16

$$\Delta lnm_t = \alpha + \lambda Q_{t-1} + \sum_{i=1}^{n} \beta_i \Delta Inm_{t-i} + \sum_{i=1}^{n} \psi_i \Delta lnreer_{t-i} + \mu_t$$

$$0.03 - 0.0005 + 0.11 - 0.09$$

$$(1.38) \quad (-0.04) \quad (0.54) \quad (-0.27)$$

Note: figures in parentheses are t-statistic.

Q_{t-1} is the error correction term generated from the Johansen multivariate procedure and the parameter λ is the error correction coefficient that measures the response of the dependent variable to depart from the equilibrium. The optimal lag length was 1 based on FPE, AIC, and SC. Error correction results shows that the error correction term Q_{t-1} has the correct negative sign and is significant for the real effective exchange rate. As no lagged term is significant there is no-causality from either direction. However, long-run relationship exists between imports and the real effective exchange rate.

TABLE 3

Bivariate results of Johansen's method

Hypothesis	λ-max	95%CV	Hypothesis	λ-trace	95%CV
A. lnMd lnREER					
$H_0: r = 0$			$H_0: r = 0$		
$H_1: r = 1$	20.11	12.32	$H_1: r \geq 1$	19.68	11.22
$H_0: r \leq 1$			$H_0: r \leq 1$		
$H_1: r = 2$	0.44	4.13	$H_1: r \geq 2$	0.44	4.13
B. lnMd ln (PM/WPI)					
$H_0: r = 0$			$H_0: r = 0$		
$H_1: r = 1$	7.52	14.26	$H_1: r \geq 1$	7.56	15.49
$H_0: r \leq 1$			$H_0: r \leq 1$		
$H_1: r = 2$	0.04	3.84	$H_1: r \geq 2$	0.04	3.84
C. LnMd lnY					
$H_0: r = 0$			$H_0: r = 0$		
$H_1: r = 1$	10.69	14.26	$H_1: r \geq 1$	10.80	15.49
$H_0: r \leq 1$			$H_0: r \leq 1$		
$H_1: r = 2$	0.11	3.84	$H_1: r \geq 2$	0.11	3.84
D. LnMd lnFER					
$H_0: r = 0$			$H_0: r = 0$		
$H_1: r = 1$	8.98	14.26	$H_1: r \geq 1$	9.05	15.49
$H_0: r \leq 1$			$H_0: r \leq 1$		
$H_1: r = 2$	0.07	3.84	$H_1: r \geq 2$	0.07	3.84

TABLE 4

Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Probability
M_d does not Granger Cause Y	28	8.46	0.007
Y does not Granger Cause M_d		0.89	0.35
M_d does not Granger Cause PM/WPI	28	3.97	0.05
PM/WPI does not Granger Cause M_d		3.61	0.06
M_d does not Granger Cause FER	28	4.21	0.05
FER does not Granger Cause M_d		1.32	0.26

Since imports and other variables (income, reserves, and import prices) are not cointegrated, we examine the variables for Granger causality, the results of which are shown in Table 4. The Granger causality test is highly sensitive to the choice of lag-length. The lag selection process is based on different selection criteria as mentioned above. The lag length is 1. The reported F-statistics are the Wald statistics for the joint hypothesis. There is bi-directional causality between the import prices and imports whereas there is unidirectional causality from the foreign exchange reserves to imports.

These results have important policy implications. Real effective exchange rate has been depreciating over the years, notably since adoption of the managed floating exchange rate in 1982. Inflation appears to be the major cause of this depreciation.

Because of an unprecedented surge in oil and food prices – though it has subsided recently, Pakistan's nominal exchange rate depreciated from Rs.60 per dollar to Rs.80 per dollar. Fiscal indiscipline mainly caused by the excessive government borrowing is one of the principal cause of rampant inflation. Afzal (2009) concludes that budget deficit Granger-causes the money supply and there is bidirectional causality between money supply and inflation. Exchange rate and inflation Granger-causes budget deficit. To avert the twin-deficit menace pursuance of fiscal discipline, primarily the rationalisation of non-development expenditure and tight monetary stance are recommended so that the aggregate demand is restrained.

The State Bank of Pakistan (2008b) reported that core inflation reflected steeper inflationary pressures as it increased from 17.2 per cent in June 2008 to 21.7 per

cent in October 2008. This could reach 21 per cent in the fiscal year 2008-09 against 11 per cent target of the fiscal year 2007-08 especially, in the face of depreciating exchange rate and other factors.

Continued growth in the public sector spending caused inflationary borrowing from the State Bank of Pakistan that reached to Rs.369 billion during July 1 to November 8, 2008. Depreciation of the rupee and fast falling reserves have generated concerns about the viability of the balance of payments. The dollar-rupee exchange rate has depreciated by 15.3 percent since the beginning of the fiscal year 2008-09. Pakistan's foreign exchange reserves dropped from US$ 11.4 billion (at the end of June 2008) to a low of US$ 6.4 billion (by 25th November 2008). Considerable depletion in reserves weakened the country's ability to meet external obligations like import coverage ratio and reserves to short term debt and liabilities ratio [State Bank of Pakistan (2008b).

VI. Conclusion

In this paper we examine the impact of real exchange rate, income, imports prices and foreign exchange reserves on import demand in Pakistan for the period 1980-2008 with the expectation that the variables are important candidates in influencing import demand. Specification and diagnostic tests revealed the statistical adequacy of the import models, though the likelihood of autocorrelation renders the results slightly questionable. Income turned out to be the most important factor in determining the import demand in traditional econometrics methodology. Other factors have been found to have trivial impact on import demand.

Time series econometrics methodology provided different results. Long-run relationship exist between imports and real effective exchange rate. However, there is an evidence of no-causality from either direction. The Granger causality analysis shows that there is unidirectional causality from imports to income and from foreign exchange reserves to imports, while there is a bi-directional causality between import prices and imports.

Empirical evidence and analysis presented in the paper is supported by the country's macroeconomic situation. Depreciation of exchange rate, depletion of foreign exchange reserves, rampant inflationary pressures, excessive government borrowings, escalating import bill and the consequent swelling current deficit are the most conspicuous, distressing and perplexing economic problems. The way-out from the predicament is the pursuance of fiscal discipline in letter and spirit at the micro and macro levels.

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