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Modeling the Effects of Macroeconomic Expenditure Components on Pakistan's Import from China

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This study attempts to highlight the response of import demand from China with macroeconomic expenditure components and relative price in case of Pakistan over the period 1972-2016. The (ARDL) Autoregressive Distributed Lag approach is used to drive the long run elasticities of the import demand. The results indicate that there exists a long run cointegration between Pakistan's import from China and macroeconomic expenditure components: personal consumption expenditure, investment expenditure, export expenditure, government expenditure and relative price. Moreover, import demand is more sensitive to change in personal consumption expenditure. The investment expenditure is found to have negative impact on Pakistan's import from China. In addition the export and government expenditure have significant positive impact on import demand, whereas the relative price is positive but insignificant. It is recommended therefore that to restrict import through exchange rate policy may not be significantly important in the long run. Furthermore, the fiscal and monetary policy should be designed to support investment and export sectors. In addition, government should reduce luxury items import from China and revive free trade agreement in order to reduce trade deficit in Pakistan.

Key words: Investment, import demand, exchange rate, expenditure components

JEL Classifiactions: E22, F14, F31, F41

1. Introduction

The research over international trade has become an important key policy task in the global economy. Imports become a major discussion part of international trade in the current scenario due to its importance to

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stimulate economic growth and on the other side its negative effects on trade balance of the economy.

Many researchers estimated the import demand function more in depth to resolve the problem of trade deficit and provided useful policy implications in this regard. Pakistan facing same trade deficit problem like other developing countries. The export penetration ratio was about 10.5% in 2011-12 while it has been declined up to 7.4% in 2015-16 as this decline was mainly associated with low global demand and domestic energy crisis, on the other hand the import penetration ratio was 20.0% in 2011-12 but in 2015-16[2] it decreased by 16% and this decline was due to low oil prices. Pakistan's economy is highly reliant on imports of petroleum products, capital goods, industrial raw material, automobile and machinery, etc. These facts indicate that the economy of Pakistan is highly dependent on import demand and thus, facing trade deficit.

However, a meaningful research is essential from the macroeconomic perspective because country's reliance on imports is increasing consistently. The previous studies were mainly based on traditional approach, but later on traditional approach has been converted into expenditure approach in which import demand is estimated with expenditure components, this analysis give depth analysis of import demand over traditional approach. There exist a number of research that has received more attention to discuss the issue of import demand and expenditure components such as Alias and Cheong (2000), Xu (2002), Abbott and Seddighi (1996), Funke and Nickel (2006) and Fukmoto (2012) found the import demand elasticities with expenditure components (private and government consumption, investment and export).

As a matter of fact, the close proximity due to political and geo-social and economic relations has resulted Pakistan's high trade association with China. Given the structural changes by raising the performance of the services sector and spread the volume of remittances, Pakistan's import from China provided the evidence for high trade growth in recent year. In this perspective the role of expenditure components and relative price on Pakistan's import from China is required strong policy implication. The estimation of import elasticities with respect to China in macroeconomic policy formulation is important, the research work in this context in

[2] Economic Survey of Pakistan(2016)

Pakistan is lacking. Thus, the objective of this study is to capture the responsiveness of Pakistan's import from China with respect to macroeconomic expenditure components (investment expenditure, export expenditure, household consumption expenditure, and general government expenditure) and relative price. The ARDL bound technique of cointegration is used by using annual time series data from 1972-2016. The remainder of the study is organized in five sections. Section 2 highlights Pakistan - China trade overviews Section 3 sets out the empirical literature. Section 4 describes the model specification, methodology and data source. Section 5 comprises the empirical findings and interpretation of the results finally section 6 provides concluding comments.

2. Pakistan- China Trade Overview

From the last decades the volume of trade has been rising between Pakistan and China; however the percentage of export growth to China on yearly basis has been reducing. The following table shows an expansion of bilateral trade, but balance of trade is constantly rising in favor of China.

Table 1: Pakistan- China Trade

US$ Millions

Year	Export	Import	Total Trade	Balance
1990	71.8	271.2	343	-199.4
1995	90.6	458.1	548.7	-367.5
2000	180.4	471.6	652	-291.2
2005	354.2	1842.9	2197.1	-1488.7
2010	1153.9	4410.6	5564.5	-3256.7
2015	2169.5	10395	12564.5	-8225.5

Source: State Bank of Pakistan (2015)

Pakistan's exports are mainly based on raw material, cotton and copper etc. On the other hand, the imports are consist of value added manufactured goods and machineries. Consequently, China's export to Pakistan constitutes more than 20% of its imports, while Pakistan's exports to China only 0.13% of Chinese import.

Table 2: Pakistan's Export growth and Import growth with China

Year	Export Growth %	Import Growth %
1973	34.30	80.85
1976	16.45	2.78
1981	147.73	20.55
1985	19.09	14.92
1988	159.38	6.35
1991	15.32	42.37
1995	68.72	4.35
2000	21.16	19.30
2005	22.94	59.74
2008	19.31	32.66
2010	64.47	7.96
2015	10.27	34.55

Source: State Bank of Pakistan (2015), calculated by author.

In the initial years, the trade balance was in favor to Pakistan. During the Korean War, the demand for Pakistan's exports of cotton and jute was high in China. On the other hand Chinese items were less popular in Pakistani market because of tight import control policy and competition from western items. Table 2 shows that Pakistan's export growth to China is about 34.30% while import from China is quit high 80.85% in 1973. In order to remove the ban and other restriction on imports in 1977 the export to china has jumped high about 45.20% while import from China to Pakistan was slightly increase but not more than export growth. As the economy moves towards trade liberalization, the export growth increase up to 147.73% and import growth increase about 20.55% in 1981. However, in 1991 the Pakistan's export to China decline about 15.32% and import from China was jumped high 42.37%. In 2003 a preferential trade agreement was signed and it becomes operational in 2004. In 2005 Pakistan- China trade showed continuous increase, but again was in favor of China. Even in 2006 both countries signed a Free Trade Agreement (FTA), but, after this agreement Pakistan facing trade deficit with China because, Pakistan's export to China has not increased but import from China raised significantly. Consequently, Imports showed downward trend in 2010 because of global financial crisis in 2008. In 2010 the export growth increased sharply, while the import growth declined so far 7.96% against of 32.66% in 2008. In 2015 the case became opposite and Pakistan again faced trade deficit with China.

3. Review of Literature

Traditionally, import demand is determined by income and relative price. However, the importance of the determinants of import demand explained differently in trade related theories such as the theory of comparative advantage, Keynesian theory (trade multiplier) and new trade theory. Two models are generally dominating like perfect substitute and imperfect substitute model. The imperfect substitute model is widely used in empirical analysis to formulate the import demand model traditionally or with disaggregating the domestic activity. Following many empirical studies highlight the determinants of import demand.

Abbott and Seddighi (1996) estimate the UK's import demand function with the expenditure components. The authors use Johansen cointegration technique for empirical long run estimation. The results find the long run relationship between import demand and its determinants. The import demand is highly elastic (1.29) and statistically significant with a 1% change in consumption expenditure on the other hand, import demand is inelastic with investment and export expenditure (0.26) and (0.10) respectively. Furthermore, the coefficient of import demand shows small sensitivity (-0.105) with the change in relative price. The study concludes that the trade distortion may not reduce through the implication of exchange rate policy in UK.

Dutta and Ahmed (2004) empirically estimate the aggregate merchandise import demand function for India during the period 1971-1995. The cointegration and error correction modeling approaches are used in the study. The results highlight that in the long run the aggregate import demand is cointegrated with GDP and relative price. In the short run, the real import price, GDP (lagged two periods) and dummy of import liberalization policies are main determinants to influence the aggregate import. Moreover, the coefficient of error correction indicates the slow speed of adjustment towards equilibrium. This study suggests that import demand is highly influenced by real GDP. So, if general level of economic activity grows faster it will lead to import growth. On the other hand import demand is not more sensitive with relative price which suggest that by lowering of import prices through reduction of tariff and non tariff barriers will be ineffective to increase the demand of imports in India.

Therefore, the import demand will not sufficiently influenced by import liberalization policy.

Joseph and Fosu (2006) highlight the role of expenditure components on aggregate import demand in Ghana. The study uses time series data over the period 1970-2002 by applying ARDL bounds testing approach and error correction mechanism to connect the relationship between import demand and expenditure components. The results indicate that the import demand shows inelastic behavior with respect of expenditure components and relative price. Investment and export are the main determinants to influence the import demand in the long run. In addition, in the short run household and government expenditures are the main variables to change in import demand. Moreover, the import demand is not more sensitive with relative price but, shows negative relationship. They conclude that price competitiveness in international market should improve, which enables the economy to reduce trade deficit as well as enhance the volume of foreign exchange. Eventually, price competitiveness may increase the export sector side by side increase the production of domestic industries.

Agbola (2009) empirically estimates the role of expenditure components on import demand function in Philippines. The study uses time series data form 1960-2006 by applying Johansen cointegration and error correction mechanism. The results explore that there is a long run relationship exist between import demand and its determinants. Moreover, the import demand elasticities with respect to expenditure components are inelastic both in the short run and long run. The import demand is more influenced by export and private investment in the short run while, in the long run export, government expenditure and private investments are the main determinants of import demand. This research suggests that the exchange rate policy may not be suitable in case of Philippines. On the other hand, interest rate policy and trade liberalization policies will be more effective in the long run and short run.

Constant and Yue (2010) examine the disaggregate import demand function for Cote D'Ivoire. The authors use time series data over the period 1970-2017 by using ARDL approach to cointegration. The results show that there is long run equilibrium relationship exist among variables. The results further indicate that import demand is inelastic by 1% change in all expenditure components, specifically investment and export are the main determinant to change in import demand. The coefficient of relative

price is inelastic and insignificant with respect to import demand. This study point out that economic growth can be achieved through the improvement in price competiveness.

Yin and Hamori (2011) find the import demand elasticity in China by using ARDL technique from the period 1978-2009. The results postulate that import demand response more with the change in investment expenditure this result indicates that if the increase in domestic investment, it will increase the demand for more imports which resulted a trade deficit in China. The authors conclude that domestic inflation may cause to increase import demand in China, therefore, it is necessary to design a policy to curb domestic inflation. In addition, if China's economy is continuously dependent on high import than export, it will further deteriorate the trade balance in China.

Hibbert, Thaver and Hutchinson (2012) analyze the import demand behavior of Jamaica's with the United States and United Kingdom. This study uses quarterly data form Q1: 1996 to Q3:2010 by applying ARDL technique of cointegration and Error correction mechanism. The results indicate that in the case of Jamaica-US import, GDP is statistically significant and negatively related with import in the short run but, in the long run it shows the positive relation. The import is more influence by change in exchange rate and foreign exchange reserve has a positive influence on import demand but, statistically insignificant. On the other hand, in the case of Jamaica-UK import, GDP and exchange rate volatility response inelastic in the short run than in the long run. Furthermore, foreign exchange reserve and relative price are both statistically significant and not highly inelastic with respect to import demand. In addition the dummy variable of tight monetary policy indicates a significant influence on Jamaica's import demand for UK but, not with the US because of highly trade dependence on USA. This study provides policy implications that Jamaica should reduce the import of capital , oil and intermediate goods by adopting fiscal and monetary policies as well as there is a need of diversification of export base. Moreover, to develop strong trade relations with other island countries such as Trinidad and Tobago to reduce the dependence on US import. Finally, to promote the regional currency with island trading partners this may reduce the pressure on balance of payment in the case of import from US and UK.

Majeed and Waheed (2012) capture the role of expenditures components on import in Pakistan by using time series data from 1974 to 2009. The study uses Johansen multivariate cointegration technique and error correction model to find the long run and short run response of import demand. The empirical results show that the long run association exists between import demand and expenditure components. The import demand is highly sensitive with the change in consumption expenditure. Consequently, the consumption and investment are the main variables to change the import demand in the short run. This study concludes that there is a need to control inflation over import prices because if a domestic price continues to grow faster this will lead to further promote trade deficit in Pakistan. Furthermore, Government should ban against the unnecessary imports in Pakistan.

Khan, Khan and Uz-zaman (2013) find out the relationship between import demand and expenditure components in Pakistan by applying the time series data from 1981-2009. This study uses the Engle- Granger and ARDL bounds technique of cointegration. The results confirm the long run relationship between import and its determinants. Furthermore, the investment expenditure plays an important role followed by consumption and export expenditure to change in import demand in Pakistan. This study recommended that the exchange rate policy may be more useful in improving trade balance. Furthermore, the policy makers design the fiscal expenditure to promote investment goods rather than expenditure on consumption.

Marabuah (2013) estimates the Ghana's import demand function by finding the impact of the relative price, international reserves and expenditure components. The ARDL and error correction techniques have been used to find the cointegration relationship between the variables. The results indicate that coefficient of import demand is inelastic with all estimated coefficients except the consumption expenditure. The private consumption expenditure is more responsible to change the import demand in Ghana. The study concludes that the macroeconomic policies should be designed in the context of consumption pattern towards imported goods in order to improve trade condition in the economy.

Ziramba and Bbuku (2013) find elasticities of the import demand and expenditure components in Namibia. The authors use Autoregressive distributed lag technique by applying time series data from 1980-2009.

The results indicate that in the long run the coefficient of import demand is more sensitive by 1% change in investment expenditure, consumption expenditure and relative prices. The study recommends that the exchange rate policy may not be effective in regulating the import in Namibia. The policy makers should design the policy to curb the domestic inflation. Furthermore, the monetary and fiscal policies both should be used in effective manner to maintain the internal and external balance in the economy.

Budha (2014) analyzes the effect of expenditure components in Nepal's import from India by using time series data from 1975-2011. The author uses autoregressive distributed lag technique. The study finds a long run association between import demand and its determinants like personal consumption, government expenditure, investment, export and relative prices. The Nepal's import demand from India is highly influenced by change in personal consumption, while the export and domestic investment coefficients show negative and relative price indicates a positive relationship with import demand, which indicate that increase in domestic investment and export reduce the import bill in Nepal. The study concludes that the expenditure switching policy will be feasible from personal consumption to other sectors by adopting monetary and fiscal policies, while exchange rate policy will not be beneficial to reduce trade deficit in Nepal.

The above section discussed the number of studies that empirically examined import demand model with its determinants. The literature provided the importance of import demand to design the trade policy in the context to resolve the trade deficit in the economy. Although most of the studies have empirically highlighted the issue of foreign trade of Pakistan, but yet no any empirical research work have been done in the context of disaggregated demand function for Pakistan's import from China. Therefore, this study fills the research gap by providing analytical evaluation about the contribution of macroeconomic expenditure components and relative price in determining the Pakistan's import behavior from China.

4. Model Evaluation and Econometric Technique

Theoretically, the import demand function is generally explained by real domestic income (Y) and relative price (RP). Economically, both

variables and their elasticities are particularly important to design the import demand policy in the long run. The import demand model is shown as:

$$M = f\ (Y, RP) \tag{1}$$

Here, (*M*) shows imports of goods and services, (*Y*) represents the real income and (*RP*) indicates the relative price of import. Then, following literature Giovannetti (1989), Narayan and Narayan (2005), Majeed and Waheed (2012) and Ziramba and Bbuku (2013) estimate the import demand elasticities with expenditure components and relative price.
For measuring the elasticities of macroeconomic expenditure components on import demand in Pakistan from China, a linear regression analysis are constructed which has the following functional form as:

$$LM_t = \alpha_o + \alpha_1 LI_t + \alpha_2 LEX_t + \alpha_3 LG_t + \alpha_4 LPC_t + \alpha_5 LRP_t + \mu_i \tag{2}$$

Where *(LM)* indicates the log of import from China, *(LI)* is the log of gross fixed capital formation, *(LEX)* is the log of export of goods and services, (LG) is the log of general government expenditure, *(LPC)* is the log of private expenditure, and *(LRP)* represents the relative price of imports, and *ui* is an error term.

4.1 Data Source

The current study uses annual data of different macroeconomic expenditure variables and import demand from China to Pakistan from the period 1972- 2016. The multiple data sources such as World Development Indicator; (WDI) and Hand Book of Statistic; State Bank of Pakistan (SBP) are used to collect import demand from China to Pakistan (LM), gross fixed capital formation (LI), export of goods and services (LEX), general government expenditure (LG), private consumption expenditure (LPC) and relative price of import (LRP). All data series are transformed in natural logs and in billions US dollar with base year 2010.

4.2 Estimation Technique

4.2.1 The stationary Test

This study used the Augmented Dickey Fuller (ADF) statistic and Phillips- Perron (PP) test in order to control the problem of spurious regressions. Both unit root tests carried out under the null hypothesis that the series used in the study is non-stationary against the alternative hypothesis of a unit root.

4.2.2 Long Run Analysis

There are several cointegration tests available to highlight the long-run association among the underlying series. The previous work used Engle-Granger (1987) and Maximum likelihood technique Johansen (1991, 1992), and Johansen and Juselius (1990). Recent studies have generally used autoregressive distributed lags (ARDL) model developed by Pesaran and Shin (1995, 1999) and further modified by Pesaran, Shin, and Smith (1996, 2001). The ARDL modeling approach has many advantages over other earlier methods of cointegration, such as, the order of integration does not matter here, whether a set of variables included in the ARDL model are I (0) or I (1). Moreover, this technique is suitable for small sample, even the variable series contain on different lags.

Because of these benefits, this study used ARDL bond testing approach. The equation (3) is represented here in the ARDL form:

$$\Delta LM_t = \kappa_o + \sum_{i=0}^{K1} \delta_1 \Delta LI_{t-i} + \sum_{i=0}^{K2} \beta_2 \Delta LEX_{t-i} + \sum_{i=0}^{K3} \omega_3 \Delta LG_{t-i} + \sum_{i=0}^{K4} \eta_4 \Delta LPC_{t-i} + \sum_{i=0}^{K5} \phi_5 \Delta LRP_{t-i} + \sum_{i=1}^{K6} \varphi_6 \Delta LM_{t-1} + \lambda_0 LI_{t-1} + \lambda_1 LEX_{t-1} + \lambda_2 LG_{t-1} + \lambda_3 LPC_{t-1} + \lambda_4 LRP_{t-1} + \lambda_5 LM_{t-1} + \upsilon_t \quad (3)$$

Equation (3) identified the long run relation among variables which are already defined in equation (2), here K_1, K_2…….K_6 are representing the optimal lag length which is measured by information criterion and Δ denotes the first difference operator. Bound technique approach is technically based on F or Wald- Statistics, a joint significant test under the null hypothesis of no cointegration $H_{0:}\ \alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ against the alternative hypothesis $H1_{:}\ \alpha_0 \neq \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$ is tested. This F test is carried out non-standard distribution and two sets of

critical values. The lower bound critical value indicates the regressors hold I(0) and the upper bound assuming that the regressors contain I(1). The decision of cointegration is based on these lower and upper bond F values. If F calculated value exceed the upper bond then H_0 will be rejected. If the F value is lower than the lower bound the H_0 will not be rejected and test become inconclusive, if F calculated values lay between these two critical bound.

Next, this study estimates the short-run relationship by applying an error correction technique. The short run dynamics are presented as follows:

$$\Delta LM_t = \kappa_o + \sum_{i=0}^{K1} \delta_1 \Delta LI_{t-i} + \sum_{i=0}^{K2} \beta_2 \Delta LEX_{t-i} + \sum_{i=0}^{K3} \omega_3 \Delta LG_{t-i} + \sum_{i=0}^{K4} \eta_4 \Delta LPC_{t-i} + \sum_{i=0}^{K5} \phi_5 \Delta LRP_{t-i} + \sum_{i=1}^{K6} \varphi_6 \Delta LM_{t-1} + \lambda_5 ECM_{t-1} + \upsilon_t \quad (4)$$

Here, $\delta_1, \beta_2, \omega_3, \eta_4, \phi_5, \varphi_6$ are dynamic short run elasticities of the empirical model which moves towards long run equilibrium. ECM shows error correction term and λ indicates the speed of adjustment towards long run equilibrium.

5. Empirical Application

In the application of ARDL model, there is no requirement of order of integration, but in the estimation process any higher order of integration like I(2) may estimate unreliable results Ouattara (2004). To assure that if the series is integrated at lower than the I(2), the Augmented Dickey Fuller test will be best to perform. The results of stationary test is reported in Table 3, here all series are non-stationary at level, but after applying first difference the series became stationary at order I(1).

Table 3: Unit Root Test

Variables	ADF test statistic p-value				PP test statistic p-value			
	I(0)		I(1)		I(0)		I(1)	
	C	C&T	C	C&T	C	C&T	C	C&T
LM	0.1887	0.3398	0.0000	0.0000	0.1887	0.3398	0.0000	0.000
LI	0.3027	0.5616	0.0004	0.0016	0.3278	0.7473	0.0004	0.0020
LEX	0.7161	0.7965	0.0000	0.0000	0.7118	0.7240	0.0000	0.0000
LG	0.9156	0.5185	0.0000	0.0000	0.9305	0.5050	0.0000	0.0000
LPC	0.9097	0.4124	0.0002	0.0009	0.8717	0.3350	0.0002	0.0009
LRP	0.8665	0.3676	0.0000	0.0000	0.8693	0.3538	0.0000	0.0000

Source: Authors' estimations

The long run coefficients are estimated by Equation (3) with selecting 4 lags which measured by AIC and BIC.

The ARDL bond testing approach estimates the total $(4+1)^5 = 3125$ regressions. The model is selected by AIC criterion which is (444344). Table 4 shows calculated values along with Narayan (2004) critical bond values; the results finally present that the calculated F value is 18.483 which is greater than the upper bound limit; this result confirms the existence of cointegration in the model.

Table 4:F-statistics for Co-integration Relationship

Bound Critical Values (Restricted Intercept and No Trend)				
	value		I(0)	I(1)
F- statistic	18.48302**	1%	3.871	5.571
		5%	2.741	4.060
		10%	2.293	3.448

Note: Critical values are obtained from Narayan (2004) – Case II and ** denotes statistical significance at 1% level.

The long run elasticities of import demand are reported in table 5.

Table 5: Estimated Long Run Elasticities of Import Demand
ARDL (444344) selected on the basis of AIC

Dependent variable is Import (LM)			
Regressors	**Coefficient**	**Standard Error**	**T-Ratio[Prob]**
LI	-3.125376	0.911723	-3.427987[.0056]
LEX	1.297228	0.639014	2.030047[.0672]
LG	1.465998	0.244552	5.994635[.0001]
LPC	1.443075	0.666505	2.165139[.0532]
LRP	0.238752	0.351518	0.679202[.5110]
C	-2.957446	1.793210	-1.649247[.1273]
Diagnostic Test			
R-squared	0.976470		
R-Bar-Squared	0.916577		
F-statistic	16.30339[.000]		
A: Functional Foam	F (1, 10)= 0.012645[.912]		
B: Serial Correlation	F (2,9)= 0.829618[.467]		
C: Heterosedasticity	F(28,11)= 1.012948 [.519]		

Note: A: Ramsey's RESET test using the square of the fitted values.
B: Lagrange multiplier test of residual serial correlation
C: Based on the regression of squared residuals on squared fitted values.

The estimated results confirm the long run equilibrium between macroeconomic expenditure components and import demand in Pakistan from China. The elasticities of investment expenditure, export expenditure, general government expenditure, and private consumption expenditure are statistically significant while the elasticity of relative price is positive but insignificant. The results find that domestic investment in Pakistan has a negative impact on import from China, which indicates that if domestic investment activities grow faster in Pakistan, it will reduce the import demand from China.

Furthermore, the coefficient of import demand is positive and elastic (1.297) with respect to export expenditure which indicates that the export growth in Pakistan enhances the import growth. In addition the elasticity of import demand is highly elastic (1.443%) with respect to private consumption and statistically significant with a correct positive sign, this result provides the true picture of Pakistan's economy as Pakistan is consumption based economy and consumption expenditure is highly dependent on import from China. The coefficient of government

expenditure has positive and significant. On the other hand the relative price indicates a positive, but insignificant impact on import demand.

In addition, the bottom of Table 5 consists of diagnostic tests which confirm that the model is well fitted with a high R^2. The LM test is used for serial correlation which confirms no serial correlation. Ramsey's RESET confirms that the functional form is correct, whereas the White's test for hetroscedasticity test also supports to no hetroscedasticiy in the model.

The results of short run behavior of macroeconomic expenditure components on import demand is applied through error correction mechanism from equation (4) which is presented in Tale 6.

Table 6: Results of Error Correction Model
ARDL (444344) selected on the basis of AIC

Dependent variable is Import (LM)			
Regressors	**Coefficient**	**Standard Error**	**T-Ratio[Prob]**
DL(M(-1))	-0.45742	0.18054	-2.5336[.027]
DL(M(-2))	-0.64878	0.11985	-5.4132[.000]
DL(I)	-2.00401	0.63905	-3.1358[.009]
DL(I(-1))	-3.68779	0.76298	-4.8333[.000]
DL(I(-2))	0.16268	0.78401	0.2074[.839]
DL(I(-3))	2.72243	0.58397	4.6618[.000]
DL(EX)	0.44898	0.22351	2.0086[.069]
DL(EX(-1))	0.21085	0.21917	0.9620[.356]
DL(EX(-2))	0.69744	0.19589	3.5603[.004]
DL(EX(-3))	-0.62248	0.25601	-2.4314[.033]
DL(G)	1.71081	0.27915	6.1285[.000]
DL(G(-1))	-0.12221	0.38333	-0.3188[.755]
DL(G(-2))	0.40355	0.29198	1.38207[.194]
DL(PC)	1.43050	0.43650	3.2771[.007]
DL(PC(-1))	-2.37809	0.54490	-4.3642[.001]
DL(PC(-2))	2.50516	0.52004	4.8171[.000]
DL(PC(-3))	0.61738	0.36710	1.6817[.120]
DL(RP)	-0.08623	0.31588	-0.2729[.789]
DL(RP(-1))	-1.43174	0.35081	-4.0812[.001]
DL(RP(-2))	-0.07931	0.34241	-0.2316[.821]
DL(RP(-3))	0.45704	0.22650	2.0178[.068]
CointEq(-1)	-0.68211	0.21145	-3.2257[.008]

Source: Authors' estimations

The coefficient of ECM is identifying the short run dynamics at which import demand will change by changing in explanatory variables. The significant ECM(-1) term is (-0.682) which shows the existence of cointegration and this coefficient shows the potential effect of adjustment from short run to long run which is about 68%. Moreover, the coefficient of investment (ΔI_t) appears to be negative and significant at level, but at first lag (ΔI_{t-1}) the sign of the coefficient supports the long run results. Similarly, the coefficient of export is positive at current and second lag and statistically significant. The coefficient of private consumption shows mixed signs, but its sum is positive (5.400) and significant.

5.1 Stability Test of the Model

This study uses the stability test to find the stability of the model. The stability of import demand model may help to develop a well organize trade policy. This study focus on, how parameter response over time periods through the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) test, and the recursive coefficient test (Brown, Durbin, and Evans, 1975) to detect the parameter stability.

Figure 5.1(a): Cumulative sum of Recursive Residuals

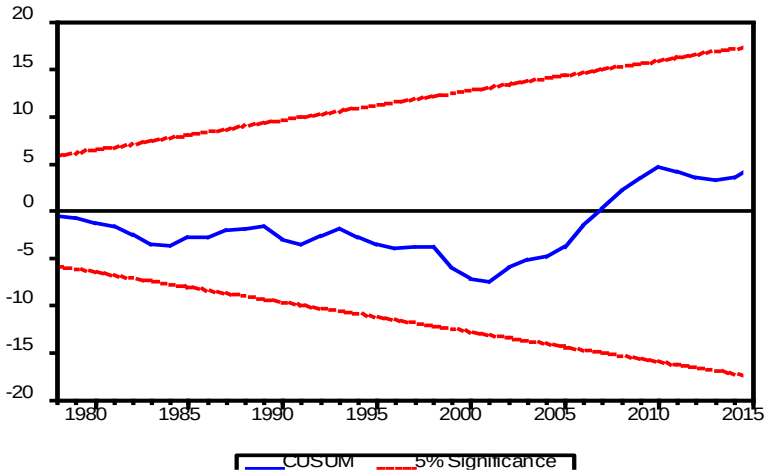

Figure 5.1(b): Cumulative sum of Squares of Recursive Residuals

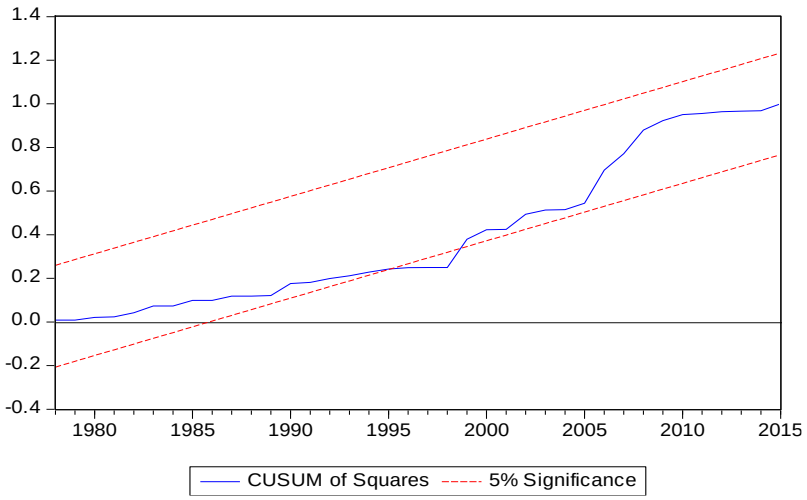

Figure 5.1(a) represents that the Cusum statistic is within the critical boundaries at 5% significance level and there is no systematic change is detected, while figure 5.1(b) shows that Cusum of square statistic is deviated from critical boundaries in 1997 but after 1999 it lies in the boundaries at 5% significance level. This test clearly shows that Pakistan's import demand function from China is stable.

6. Concluding Remarks and Policies

The purpose of this study is to estimate the response of import demand from China by using the variables of expenditure components in case of Pakistan. This study used time series data from 1972-2016. The ADF and PP stationary tests were applied to confirm the stationary the series. In addition the ARDL technique captured the long run elasticities of final expenditure components and relative price with respect to Pakistan's import from China. The bounds test explores that the long-run elasticity exists between Pakistan's import from China and its determinants. The results indicate that domestic investment in Pakistan has a negative impact on import from China, which elaborates that if domestic investment activities grow faster, it will reduce the import bill in Pakistan. Such negative relationship also explore that an increase in productive capacity in Pakistan will promote domestic investment with less reliance on import from China. On the other hand, the coefficient of import demand

elasticity with respect to export is positive and elastic (1.297) and statistically significant which indicate that the export growth in Pakistan is dependent on import growth from China. Consequently, export growth stimulates the economic growth in Pakistan side by side increase the balance of trade distortions.

Moreover, the government expenditure is also a positive and significant impact on import demand. The coefficient of private consumption is a positive and significant effect on the Pakistan's import from China. It indicates that high domestic demand especially personal consumption leads to high import pressure in Pakistan. While, relative price indicates a positive but insignificant impact on import demand.

This study has some policy implications, the government should promote investment activities by providing tax rebate and subsidies to domestic investors, and this may help to reduce the import demand from China. Further, Pakistan's export is highly dependent on China's import which indicates that export growth may increase economic growth, but the same time push the import growth in Pakistan. So policy makers should move their direction towards import substitution policy by replacing the policy of export promotes economic growth with high import content. Moreover, the most important policy task in reducing the Pakistan's import from China is to adopt the expenditure switching policy from personal consumption to other productive sectors. The fiscal and monetary policy should be constructed keeping in the view of investment and export sectors as well as unnecessary imported items should be banned or impose high tariff and import duties in Pakistan. Finally, Pakistan should improve trade volume with China and other trading partners to achieve favorable balance of payment.

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