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The Impact of Capital Inflows on Competitiveness of Pakistan's Economy

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Abstract:

Foreign capital and exchange earnings are required for economic growth and development. Foreign capital inflows received by the economies are distributed between non-tradable and tradable sectors. Yet, appreciation of real effective exchange rate (REER) might be instigated through an increase in the price of non-tradable commodities. Appreciation in the real exchange rate thus leads to loss of competitiveness, which in turn contract exports. Within this perspective, this paper investigates variations in competitiveness by considering the effects of different types of capital flows and some policy variables on the REER, for the period 1976-2015. Existing literature confirms positive effect of capital flows on the REER. By applying ARDL cointegration technique, this paper predicated that official development assistance, investment income, increased remittances, and other foreign investments lead to real appreciation whereas increased government expenditures cause a real depreciation. Terms of trade, trade openness, and foreign direct investment are identified to be statistically insignificant. Findings of the study drawn from the analysis of the influence of capital inflows and control variables have important implications for policies in the areas of domestic demand management, exchange rate management, export promotion, etc.

Keywords: Real Effective Exchange Rate, Openness, Terms of Trade

1. INTRODUCTION

Because of fierce competition in the global market arena, study of international competitiveness of an economy is receiving serious

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attention by academicians and policymakers. As a result, a good body of theoretical work is now available. The bulk of studies, however, concentrate on conceptual underpinnings and subjects indirectly related to competitiveness, or on particular aspects of competitiveness. For instance, while growth in productivity has an intuitively apparent linkage to competitiveness, the literature on growth in productivity seldom provides thorough analysis of such a nexus.

What the existing literature indeed offers about competitiveness are theories, frameworks and models that provide indirect, though meaningful, deductions on competitiveness.

Changes in competitiveness are an outcome of complex dynamic processes, through which a set of its underlying determinants are interlinked to attain a certain level of competitiveness. In literature, five types of basic determinants of competitiveness are identified: factors of production, market conditions, enterprise-level infrastructure, industry environment, and national economic environment.

The empirical literature on competitiveness is concerned with empirical implementation and analysis of the above types of relationship. Such studies use at least five different measures of competitiveness: trade-related, productivity-related, technology-related, efficiency-related, and price-related.

For this paper, we only use price-related measure of competitiveness. More specifically, the real effective exchange rate *(REER*) as one of the measures of competitiveness is used in this study.

Being internationally competitive involves a rather simple notion of either producing at a lower cost domestically or selling at a lower price than the competitors internationally. It thus follows that the cost or price differential should provide a gauge to measure competitiveness. In particular, to the extent that what produces competitiveness, such as product advantage, productivity growth and technological change, is captured in them, relative costs and prices can be regarded as measure of competitiveness. As usually practiced in the literature, export performance, a revealed indicator of competitiveness, is explained by relative price. Diverse price-related measures of competitiveness are available; including, relative export price, relative import price, unit labour cost, and *REER*.

The *REER* is preferred over other tools for the assessment of international competitiveness. The index of *REER* is drawn by deflating the nominal exchange rate through a price deflator. Since *REER* can also be obtained through altering the monetary value of exchange rate by changing the ratio of price of non-tradable to tradable goods. A rise in the value of *REER* can be regarded as appreciation in the real value of the domestic currency.[1]

At this juncture, a pertinent question is what determines *REER*? Out of the important factors which determine the changes in *REER* (i.e., competitiveness) are foreign capital flows. Distribution of capital flows between tradable and non-tradable sectors of countries who receive them, are expected to influence the price ratio of tradable and non-tradable goods, which ultimately affect the *REER*. A major concern is often found in policy debates whether net capital inflows cause real appreciation of the domestic currency or have no impact on it. A bulk of the existing literature shows that a surge in capital flows causes the real effective exchange rate to appreciate. Real appreciation of national currency has adverse implications for the balance of payments, an outcome often referred as the Dutch Disease[2] problem in the literature. In sum, the controversy regarding the impact of capital flows on *REER* remains unresolved to date.[3]

Capital flows and foreign earnings to developing countries essentially consist of official development assistance (*ODA*), foreign direct investment (*FDI*), portfolio investment, investment income from abroad, remittances, etc. *FDI* is considered as the most stable and advantageous form among the capital flows because it can bring with itself many benefits including increased access to foreign markets,

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[1] See, Salter (1959) and Swan (1960).

[2]As stated by Dutch Disease capital inflows affect *REER* through tradable and non-tradable goods' prices, and then affect the level of international competitiveness. This dual effect generates a problem for policy makers in managing the capital inflows in order to maximize the welfare of the economy.

[3]Studies regarding the impact of capital inflow, in disaggregate form, depicts contradictory and ambiguous impact. Some studies show positive impact of capital inflows on competitiveness while others portray the negative impact on it. For instance, Nwachukwu (2008) and Issa and Ouattara (2004) found capital flows to have negative effect on the *REER*, while others conclude that an increase in capital flows causes the appreciation of the *REER* [see, Elbadawi and Soto (1994); Nyoni (1998); Lartey (2007); and Lopez, *et al.*, (2007)].

management expertise, and transfer of technology. Additionally, *FDI* has lower sensitivity to international interest rates and is driven by consideration of long term profitability [Khan (1998)].

Since the 1990s developing countries have experienced sharp increase in capital flows in the form of foreign loans [Khan (1998)], *FDI*, remittances, etc. Whereas, the receiving countries do benefit from foreign capital flows, they also face some adverse effects. For instance, foreign capital flows, if not properly managed, can create deep monetary expansion, inflation and appreciation of real exchange rate which increases the risk for the financial sectors and widening of current account deficit [Lopez, *et al*. (2007)].

In the above context, the study of the movement of exchange rate is receiving attention by researchers and policymakers. An examination of empirical studies led us to conclude that some of the studies assess only the effect of aggregate net capital flows on the real value of exchange rate while others are confined to a few categories of capital flows. An assessment of the effect of each distinctive foreign capital flow (foreign investment income, remittances, official development assistance, *FDI* and portfolio investment) on the *REER* for the period of 1976-2015 is the major contribution of this study. It may be noted that we use *REER* instead of *RER* (real exchange rate) for estimation. This is because the *RER* represents only the bilateral exchange rate whereas *REER* considers all the partners with whom a country has large trading share. In the same way, bilateral exchange rate depicts foreign currency's price in terms of national/domestic currency whereas the multilateral exchange rate represents the price of national/domestic currency with respect to many currencies. Thus, considering the bilateral exchange rate means ignoring the other major trading partners [Sadia, *et al*. (2009)].

Consequently, the overall objective of this study is to examine the international competitiveness of the Pakistan economy by analyzing the changes in the behaviour of *REER* brought out by the different components of net capital flows as well as some selected policy variables.

Only a few studies [Chishti and Hassan (1993); Afridi (1995); Siddiqui, *et al.* (1996); and Sadia, *et al.* (2009)[4]] are available examining the factors that affect the equilibrium level of exchange rate in Pakistan.

The remaining paper consists of five sections. Some background information regarding the Pakistan economy is reported in Section 2, while Section 3 describes the theoretical and empirical models. Section 4 provides the estimation procedure. In Section 5, empirical findings are analyzed. Finally, Section 6 concludes the paper and draws implications for policy making to improve Pakistan's international competitiveness.

2. EXCHANGE RATE & CAPITAL FLOWS IN THE PAKISTAN ECONOMY

2.1. An Overview of Exchange Rate Policies

Pakistan maintained fixed exchange rate regime for nearly thirty-five years. Pakistani currency, Pak-Rupee, was linked to the Pound Sterling till 1971. With the rising influence of USA on the economies world-wide, Pakistani currency pegged to the US dollar on 17th September 1971 and exchange rate was kept fixed at Rs.4.76 per US dollar till 1972. Towards the end of 1971 Pakistan fell into the problem of rising deficit after the crises of East Pakistan, therefore the currency depreciated by 58 percent and the new exchange rate was set at Rs.11 per US dollar on 11th May 1972. This act of the Government helped in raising the export earnings. Pakistan managed to double its foreign exchange earnings through export diversification and currency devaluation.

In 1973, when US dollar was devalued by 10 percent against major currencies of the world, consequently the Pakistan appreciated its currency to Rs.9.90 per US dollar. Pakistan fell into the balance of payments and budget deficit problems in the early 1980s, because of strengthening of the US dollar and decline in workers' remittances from abroad. To deal with this problem, the regime of fixed exchange rate was

[4] It may be further noted that no study prior to the present one in Pakistan tried to calculate the *REER* by using varying weights or assessed the effect of capital flows on such as *REER*. All the available studies are confined to the analysis of capital flows on the bilateral exchange rates.

demolished and the managed floating exchange rate regime was adopted. Under this regime, on 8th February 1982, the major trading partners (almost 16 partners) picked up and Pakistani currency linked to the currencies of these partners.

On 28th May, 1998 Pakistan's nuclear test resulted into economic sanctions imposed by its Western donor organizations. In order to handle this crisis, the system of multiple exchange rates comprising of a floating inter-bank rate (*FIBR*), an official rate (pegged to US dollar), and a composite rate (combined official and FIBR rates)[5] is adopted by Government of Pakistan. On May 19, 1999, the system of dirty float exchange rate picked up. Under this, the multiple exchange rate system removed and the currency was linked to the US dollar. Till 20th July 2000, the exchange rate then defended within a narrow band (margin). Since 20th July 2000, a flexible exchange rate regime as suggested by official documents is being followed by Pakistan.

The event of September 11, 2001, had affected the Pakistan economy like other economies of the world. Appreciation of nominal exchange rate resulted into the real appreciation of the currency as domestic and foreign inflation rates were not very different. The rupee started appreciating against the dollar and kept on appreciating after increased capital inflows. The capital inflows got increased as a result of relaxation in quota restrictions that were levied on some of the Pakistani exports to the Euro zone and USA. Besides, debt rescheduling and some debt forgiveness also resulted into appreciation of the Pakistani currency. Subsequently, with high inflow of remittances and foreign capital, Pakistan's nominal exchange rate remained almost stable at Rs.60 per US dollar. In 2008 due to increase in oil prices and unstable political situation in the country foreign exchange reserves started depleting; consequently, the exchange rate depreciated sharply.

From 2008 onwards, an overall weak balance of payment position and deterioration in market conditions causes Pak rupee to face continuous depreciation. Weak capital and financial inflows stressed the external position due to their inefficiency in financing even low external current account deficit. Moreover, debt repayments in large amount

[5] See, Janjua (2007) and Mahmood (2013).

caused a decline in the foreign exchange reserves, additionally fueling the negative sentiments on depreciation of the exchange rate.

2.2. Overview of Foreign Capital Flows

The amount of foreign private investment inflows to Pakistan is smaller compared with other developing countries. In Pakistan, there remained restrictions on free flow of foreign investment that is why in the early 1970s the *FDI* flow was very low. With the passage of time Pakistan started implementing more liberal policies to attract foreign capital.

Two phases of *FDI* inflows to Pakistan can be discerned. In the first phase, the government attempted to attract *FDI* through the Foreign Private Investment Act (*FPIA*, 1976) and in the second phase which, started at the end of the 1980s, the government tried to eliminate the controls on the free movement of capital, remittances and other transfers. In the first phase, the *FDI* inflow remained low because of instable political condition in the country, and lack of soft and hard infrastructures.

In 1988, the process of liberalization and privatization started. This strategy of the government helped in improving the *FDI* inflows between 1988 and 1996. The amount of foreign investment inflow was $185.6 million in 1988 that increased to $939 million in 1996. But afterwards, there was a decline in the level of the *FDI* from 1997 to 2001. Major reasons for this decline were economic sanctions as a result of the nuclear tests, freezing of foreign currency accounts, among others. After the September 11 event, Pakistan's support against terrorism resulted into sharp rise in foreign aid and foreign direct investment.

Other investments include either the liabilities of the private sector or those of public sector. Like every other developing country, it has remained most volatile form of investment for Pakistan.

Foreign remittances are another major source of external capital for Pakistan. They have become the leading source of foreign exchange receipt for Pakistan. Since the mid-1970s, workers' remittances continuously remained larger than foreign direct investment, official development assistance and investment income from abroad. From 1976-83, an upward trend in remittances is observed and for this period

their average value is recorded to $1686.55 million. From 2001, due to inflow of remittances from USA, UK and other European countries, they reached their highest value of $4237 million in 2003.

One of the sources of capital for Pakistan is foreign aid. In the 1960s and 1970s, the Pakistan was recognized as the largest aid recipient country in Asia. A large amount of foreign aid in the 1980s was received by Pakistan, when it played an important role in the conflict between American and Russian over the Afghanistan issue. As per Pakistan Economic Survey, "the share of grant-type aid in total aid commitments reduced sharply from 80 percent in the First Development Plan (1955-60) to 12 percent in 1970-1978 and to less than 9 percent since 1993" [GoP (2009)]. After 9/11 attack things changed dramatically and the inflows of aid to Pakistan increased and touched the averaged value of $2938 million. Currently, the amount of net official aid and development assistance which was received in 2015 is $3617.

Table 1. Net Capital Flows (% of GDP): 1976-2015

Year	FDI	Other Investment	Investment Income	ODA	Remittances
1976-80	0.170	3.400	-1.119	1.333	5.469
1981-85	0.211	1.570	-1.281	0.420	8.188
1986-90	0.414	3.153	-2.171	1.59	5.966
1991-95	0.633	3.688	-2.802	1.628	3.185
1996-00	1.003	-0.287	-2.467	0.562	1.992
2001-05	0.853	-1.435	-2.679	-0.688	3.551
2006-10	3.030	2.394	-2.851	1.208	5.404
2011-15	1.000	1.345	-3.433	1.114	13.545

Source: World Bank (2008), IMF (2010), and GoP (2016).

2.3. Overview of Macroeconomic Fundamentals

The average value of government expenditures/consumption (as a percentage of *GDP*) remained higher only for 1986-90. After 1990, government expenditures/consumption (as a percentage of *GDP*) continuously faced a declining trend for most of the periods under study and remained between 8 percent and 10 percent. From 1976 to 2015, the

highest value is recorded for the year 1989, that is 16.78 percent and minimum value is recorded for the year 2005 that is 6.10 percent.

During much of the 1960s, Pakistan followed an import substituting strategy. This strategy led to robust growth in the exports of manufactured commodities. The 1970s was the period when government made efforts to reduce anti-export bias in its policies. Specifically, in this era government initiated wide ranging structural reforms, the aim of which was liberalising the economy [Mahmood and Qasim (1992)]. The Government continued this process of trade liberalization in the 1990s. The effect of this liberalization can be seen by observing trends in exports and imports. After this, a consistent increase in both exports and imports is observed, with the share of exports always remained smaller than imports. The gap between exports and imports started rising since 2005 owing to loss of competitiveness in international markets.

Table 2. Macroeconomic Fundamentals: 1976-2015

Year	GCON (% of GDP)	TOT	TOP
1976-80	10.182	177.873	31.23
1981-85	11.127	158.825	33.77
1986-90	14.746	168.866	35.72
1991-95	12.758	143.255	36.73
1996-00	10.923	159.887	33.93
2001-05	7.540	121.008	32.071
2006-10	7.479	86.943	43.444
2011-15	8.442	78.989	69.243

Source*:* World Bank (2008), IMF (2010), and GoP (2016).
Note: GCON, TOT, and TOP, respectively, stand for government consumption, terms of trade and trade openness.

International terms of trade (base=2005) remained highest just for the period 1976-80. After this although the value of terms of trade faced a declining trend for most of the periods under consideration of this study but it remained favourable only for few years during the 1990s. Therefore, the average value of terms of trade from 1981-85 and 1986-90 was observed at 158.825 and 168.866 respectively (Table 2). But, it had shown considerable deteriorating behaviour for all other years after

1990. This index with the value of 177 for 1976-80 declined to 78 for 2011-15.

3. THEORETICAL BACKGROUND

From the analysis of literature review for this study, it is quite evident that capital flows have an influence on the real value of exchange rate in Pakistan, besides other factors. In this context, theoretical underpinnings to empirically test the impact of capital flows on the *REER* can be found in the model developed by Salter (1959), Swan (1960), and Dornbusch (1974). This model is famous as 'Salter-Swan-Corden-Dornbusch' model and also as "dependent economy model". This describes the mechanism in which an appreciation in *REER* is caused by an increase in capital inflows. Two types of effects are caused by capital flows: one is *spending effect* and the other is *resource-movement effect*. Increase in real income caused by capital inflows leads to rise in the aggregate demand.

As the prices of tradable goods are exogenously given, small country assumption, this increased demand become the source of an increase in the price of non-tradable (*the spending effect*). In turn, marginal productivity of the labour in the flourishing sector of the economy increases due to these flows and hence real wages. Further, from other sectors of the economy resource are drawn to employ in the booming sector (*resource movement effect*). Within this background a surge in foreign capital inflow raises the real wages through increasing the marginal productivity of labour in that sector. Increase in prices of non-tradable corresponds to *REER* appreciation.[6]

For analyzing the influence of capital inflows on the real exchange rate, we follow the model developed by Elbadawi and Soto (1994) for estimating the equilibrium exchange rate for Chili. Consider, two sectors small open economy, tradable (exportable & importable) and non-tradable. Price of tradable is assumed to be given exogenously but domestic price of tradable is determined through the amount of tariff and nominal exchange rate. Let P_x^* and P_m^* represents foreign prices of

[6] A phenomenon known as the Dutch Disease.

exportable and importable, t_x and t_m shows tax rates levied on exports and imports, and the nominal exchange rate E, then domestic prices of tradable (P_T) is specified as

$$P_T = E[(1-t_x)P_x^*]^{\alpha}[(1+t_m)P_m^*]^{1-\alpha} \quad \ldots (1)$$

where, α and $1-\alpha$ represent export and import shares in trade simultaneously. In order to determine price of non-tradable, demand and supply of non-tradable need to be known.

3.1. Demand for non-tradable

The non-tradable goods' demand can be decomposed into private and public components. Let us assume D_{PN} and D_{GN} represents demand for private and public sectors simultaneously.

$$D_{NT} = D_{PN} + D_{GN} \quad \ldots (2)$$

Proportion of private expenditure (ϕ_n) spent on non-tradable is a fraction of absorption less total government expenditure and this proportion depend upon export, import and non-tradable price (P_N).

$$D_{PN} = \phi_n(P_x, P_m, P_N)(A - g.Y) \quad \ldots (3)$$

where, A is absorption, total income is Y and the ratio of government expenditure to total income is g.

The proportion of government expenditure (g_n) that is spent on non-tradable is a fraction of total expenditure $g.Y$.

$$D_{GN} = g_n(g.Y) \quad \ldots (4)$$

Total demand for non-tradable (D_{NT}) is thus given by

$$D_{NT} = \phi_n(P_x, P_m, P_N)(A - g.Y) + g_n(g.Y) \quad \ldots (5)$$

3.2. Supply of non-tradable

The supply of non-tradable (S_N) depends upon prices of tradable and non-tradable goods. Supply of non-tradable is specified as the fraction of income.

$$S_N = s_n(P_x, P_m, P_n)Y \qquad \ldots (6)$$

By equating demand and supply we can find out the prices of non-tradable.

$$\phi_n(P_x, P_m, P_N)(A - g.Y) + g_n(g.Y) = s_n(P_x, P_m, P_n)Y$$

Now taking total income common from both sides we get

$$\phi_n(P_x, P_m, P_N)[(A/Y) - g)] + g_n g = s_n(P_x, P_m, P_n) \qquad \ldots (7)$$

Price of non-tradable determined in this way becomes the function of export and import prices, expenditure by the government on non-traded goods, ratio of the government expenditure to total income and absorption capacity out of total income, i.e., (A/Y).

3.3. Real Exchange Rate

The real exchange rate (e) is expressed in terms of the ratio of price of non-tradable to tradable.

$$e = P_N / P_T$$
$$e = P_N / E[(1 - t_x)P_x^*]^{\alpha}[(1 + t_m)P_m^*]^{1-\alpha} \qquad \ldots (8)$$

By putting the value of P_N , we can define the RER as a function of absorption (*A*), g_n , *g*, terms of trade (*TOT*) that is, (P_x / P_m) and export taxes (t_x) and import taxes (t_m) in the following equation:

$$e = e(A/Y, TOT, g_n, g, t_x, t_m) \qquad \ldots (9)$$

Absorption capacity depends upon net capital inflow (NKI) and expected real exchange rate depreciation [(Elbadawi (1993)].

$$A/Y = \left(NKI/Y, [_t e_{t-1} - e_t]\right) \quad \ldots (10)$$

To keep the analysis simple, we are keeping the expectations regarding the real exchange rate depreciation constant as the core aim of the underlying study is to investigate the effect of capital inflows and some policy variables on the *REER*. Thus, from Equations 9 and 10, we can define the real exchange rate as:

$$e = e(NKI/Y, TOT, g_n, g, t_x, t_m) \quad \ldots (11)$$

3.4. Empirical Model

To examine the influence of capital flows on the *REER*, we follow the empirical model used by Bakkardzhieva, *et al.* (2010) and is given as;

$$REER_t = \delta_0 + \delta_1(capitalflows)_t + \delta_2(GCON)_t + \delta_3(TOT)_t + \delta_4(TOP)_t + \varepsilon ...(12)$$

where, *GCON*, *TOT* and *TOP* represents government consumption, terms of trade and trade openness while δ's are the coefficients and ε is an error term which is independently and identically distributed with mean-zero and stationary random variable. We estimate Eq. (12) by disaggregating capital flows into five constituent elements: official development assistance (ODA), investment income, foreign direct investment (FDI), other investments, and remittances. In this case, we expect positive signs of all coefficients of capital flow variables (i.e., $\delta_1>0$). Whereas, δ_2 and δ_3 are expected to be positive and δ_4 is supposed to be negative.

REER signifies the relative prices of non-tradable commodities to tradable commodities multiplied by nominal effective exchange rate

(*NEER)*.[7] Therefore, an increase in the value of *REER* shows the real appreciation of national/domestic currency.

3.5. Description of Variables

Following variables are used in estimation of empirical model:

Foreign Direct Investment (*FDI*): It is considered as a safer form of investment than any other investment because it is mainly on plant and equipment and it also brings with itself technology and know-how. Consequently, appreciation of the *REER* associated with it is smaller than any other form of capital inflow.

Official Development Assistance (*ODA*): *ODA* is usually given to ease constraint faced due to foreign exchange shortages; that is, it eases external debt servicing and complements investment in human capital and infrastructure. Important factors influencing the impact of aid inflows include spending pattern, the amount of import financed through foreign aid and the fiscal and monetary policies' coordination. The impact of aid inflows is ambiguous on the relative price and output. Due to this, the real appreciation can be caused by variation in the composition of the demand for non-traded and traded goods. As tradable goods' prices are fixed (as predetermined by international prices), therefore the prices which would tend to increase are non-tradable goods' prices. The pressure on domestic demand laid by expanded liquidity and increased prices of non-traded goods would cause the real exchange rate to appreciate. So, it can be said that if aid inflows lead to increase expenditure on non-traded commodities then it causes real exchange rate to appreciate.

Remittances: Remittances are mainly used to finance current consumption in Pakistan. Very little of them is spent on productive activities. Migrant households also affect the consumption behaviour of non-migrant household through demonstration effect. So, when capital flows in the form of remittances are very large they may create undesired

[7] See Appendix I.

problems such as real exchange rate appreciation by a surge in the prices of non-traded goods. Price of non-traded commodities goes up as a result of increased spending and demands for them.

Investment Income: Investment income received by the country will have ambiguous impact. If this income is reinvested, then it has no impact on *REER*. Like other capital flows income earned by the foreign investment may cause the appreciation of *REER*, but in some cases like those countries which are enriched with oil and have wealth funds, there is reinvestment possibility of earned income from abroad. In such a case, it can be considered that it should have no impact on the *REER*.

Terms of Trade (*TOT*): An upgradation in Terms of Trade presented as the ratio of export prices to import prices causes *REER* appreciation via rise in real income. With the rise in the prices of exports, the real income increases in the export sector and, in turn, the demand for non-traded goods also goes up. This in turn leads to real exchange rate to appreciate provided there is no substitutability of domestic goods with foreign goods. If substitution effect dominates then it will cause the real effective exchange rate depreciation.

Trade Openness (*TOP*): Improvement in trade openness which is defined as the ratio of exports plus imports to the *GDP*, leads to real exchange rate depreciation if substitution effect overwhelms the income effect.[8] Along with this, trade liberalization results in increased supply of commodities, both tradables and non-tradable, and there is also increased demand for non-tradables because of income effect, so prices of non-tradable will go up resulting into exchange rate appreciation. According to Edwards (1988) substitution effect dominates the income effect so depreciation of *REER* is caused by openness. Consequently, balance of trade is improved.

[8] Substitution effect causes the substitution of tradables for non-tradable because of low prices of importables.

Government Consumption (*GCON*): Allocation of expenditures by the government on different sectors of the economy is crucial for determining the changes in exchange rate. Government expenditures on traded commodities result in increased demand for importable, which in turn causes trade deficit. So, the depreciation in the real value of exchange rate in order to support the external balance is required. But if the government expenditures are on non-tradable then the reverse occurs.

4. ESTIMATION PROCEDURE

Different estimation procedures can be used to estimate regression equation and analyzing the control variables and capital flows, which effect the real exchange rate. Our main objective is the analysis of how capital flows impact the real effective exchange rate. In this study, we estimate the model by employing the autoregressive distributed lag (*ARDL*) approach given by Pesran and Shin (1999). This approach is further extended by Pesaran, *et al*. (2001). This approach is superior to the Engle and Granger (1987) two-step procedure and Johansen (1998) cointegration approach due to the advantages that it has over these two approaches.

Using this approach, estimation of single equation is required to find out the long-run relationship. Furthers, by applying *ARDL* methodology, long-run and short-run effects could be find out simultaneously. In this methodology, there is no requirement of explanatory variables to have same order of integration. Therefore, either the explanatory variables are *I(0)*, *I(1)* or a mixture of both, analysis can be carried out. Other methods, for instance, the Johansen, Engle and Granger approach only investigate the long run relationship among *I(1)* variables. It permits the cointegration relationship to be estimated by OLS after the identification of the lag length of the model.

This technique is superior to other methods because it can handle small data samples and bias produced by dynamic sources. Pesaran and Shin (1999), and Pesaran, *et al*. (2001) illustrate that OLS estimators obtained from short-run parameters in the unrestricted error correction model (*UECM*) are consistent, whereas the super consistent long-run

coefficients are obtained even in small sample sizes. This technique also deals with the endogeneity.

4.1. ARDL Model Specification

To estimate Eq. (12), the *ARDL* approach to cointegration defined by Pesaran, *et al*. (2001) is employed. The error correction representation of the *ARDL* model with no restrictions for (12) is specified as follows:

$$\Delta \ln(REER)_t = \theta_0 + \sum_{i=1}^{\rho} \beta_{1i} \Delta \ln(REER)_{t-i} + \sum_{i=0}^{\rho} \beta_{2i} \Delta FDI_{t-i} + \sum_{i=0}^{\rho} \beta_{3i} \Delta OI_{t-i} + \sum_{i=0}^{\rho} \beta_{4i} \Delta INI_{t-i} +$$
$$\sum_{i=0}^{\rho} \beta_{5i} \Delta remitt_{t-i} + \sum_{i=0}^{\rho} \beta_{6i} \Delta ODA_{t-i} + \sum_{i=0}^{\rho} \beta_{7i} \Delta \ln(gcon)_{t-i} + \sum_{i=0}^{\rho} \beta_{8i} \Delta \ln(tot)_{t-i} + \sum_{i-0}^{\rho} \beta_{9i} \Delta \ln(top)_{t-i}$$
$$+\varphi_1 \ln(REER)_{t-1} + \varphi_2 FDI_{t-1} + \varphi_3 OI_{t-1} + \varphi_4 INI_{t-1} + \varphi_5 remitt_{t-1} + \varphi_6 oda_{t-1} + \varphi_7 \ln(gcon)_{t-1}$$
$$+\varphi_8 \ln(tot)_{t-1} + \varphi_9 \ln(top)_{t-1} + \upsilon_t \quad \ldots(13)$$

where, ln(*REER*), *FDI, OI, INI, remitt, ODA, ln(gcon), ln(tot) and ln(top)* are, respectively, real effective exchange rate, foreign direct investment, other investment, investment income, remittances, official development assistance, government consumption, terms of trade, and trade openness. ϕ_i s represents the long run multiplier, θ_o is the drift and ν_t are white noise error. ρ is the optimal lag length and Δ is the first difference operator.

4.2. Estimation Results

Step 1:

First, the stationarity status of all the variables is checked for the identification of order of integration. This is carried out to ensure that not even a single variable is integrated of order 2 that is *I(2)* stationary or above in order to circumvent spurious results. In this case (i.e., if variable is *I(2))* computed F-statistics given by Pesaran, *et al.* (2001) become invalid (Ouattara and Strobl, 2004) as the assumption on which the bound test is based is that all the variables are *I(0)* or *I(1).*

Therefore, the execution of unit root tests in the ARDL technique might still be required to ensure that not even a single variable is integrated of order 2 or above. Hence, Augmented Dickey-Fuller (ADF) [Dickey and Fuller (1979) and (1981)] test of stationarity is carried out for checking the order of integration. The results of the test are reported in Table 3.

Table 3. Unit Root Test

Variable	ADF Test (Level)	ADF Test (First Difference)
lnREER	-1.452	-5.076***
FDI	-0.485	-4.615***
OI	-2.249**	-6.900***
Remitt	-1.144	-3.981***
INI	-4.456***	-10.363***
ODA	-2.959***	-6.986***
lnGCON	-1.811	-8.376***
lnTOP	-1.039	-6.414***
lnTOT	-1.394	-3.616***

*, ** and ***indicates the significance at 10%, 5%, and 1% respectively.

Based on the *ADF* test statistic, it is identified that other investment, investment income and *ODA* are *I*(0) while *REER*, *FDI*, remittances, government consumption, *TOP* and *TOT* have problem of unit root at level while at the first difference they become stationary.

Thus, the order of integration for variables is found to be dissimilar, i.e., *I*(1) / *I*(0) from this empirical exercise. This diversity in order of integration is a good rational for using the *ARDL* bounds testing approach to co-integration proposed by Pesaran, *et al*. (2001).

The unit root results reported in Table 3 show that the variables in our model are integrated either at order zero or one. Thus, the existence of the long run relationship through applying the *ARDL* bounds testing method of cointegration can be proceeded further.

Step 2:

In this section, the existence of cointegration is tested through the application of ARDL (autoregressive distributed lag model). Before this,

the determination of the order of lag on the first difference of the variables is essential. Optimal lag from unrestricted *VAR* model is obtained from Akaike Information Criterion (AIC) and Schwarz Bayesian Information Criterion (SBC). It is selected 2 on the basis of *AIC* (reported in Table 4).

Table 4. VAR order Selection Criteria

Lag	*LogL*	*LR*	*FPE*	*AIC*	*SC*
0	-182.9854	NA	1.98E-07	10.1045	10.49234
1	67.35791	368.927	2.98E-11	1.191689	5.070182*
2	187.8848	120.5269*	8.08e-12*	-0.888673*	6.480464

*indicates the criterion through which the lag order is selected.
Note: *LR* and *FPE* are sequential modified LR test statistic (each test at 5% level) and Final prediction error, respectively.
AIC: Akaike information criterion. *SC*: Schwarz information criterion.

Step 3:

The F-statistic for the *ARDL* co-integration test is figured out using the Wald Coefficient restriction test after estimating the *ARDL* equation by Ordinary Least Square (OLS) Procedure. The number obtained is then equated to critical values calculated by Pesaran, *et al*. (2001). The calculated F-statistics of the joint null hypothesis of no long-run association among the variables is 4.540, which is larger than the upper bound of the 90, 95 and 99 percent critical value interval (Table 5). This suggests the rejection of the null hypothesis.

Table 5. F-Statistics of Cointegration Relationship

Test Statistics	10%		5%		1%		Cointegration
4.842353	*I*(0)	*I*(1)	*I*(0)	*I*(1)	*I*(0)	*I*(1)	Yes
	1.85	2.85	2.11	3.15	2.62	3.77	

Source: Pesaran, *et al.* (2001, p. 300), Table Cointegration (CI) (ii) Case II: Restricted intercept and no trend.

The estimates of the long run association between the *REER* and capital flows are reported in Table 6 while the results of short run model are given in Table 7. The results of various diagnostic tests are specified in Table 8, while Figures 4 and 5, respectively, show the *CUSUM* and *CUSUMQ* statistics' plot.

The model explains approximately 53 percent of the variation in *REER* and satisfies the diagnostic checks of serial correlation, *J.B.* test of normality, ARCH test of hetreoskedasticity and Ramsey Reset test of specification. Hence, the performance of this model is satisfactory.

According to the estimates reported in Table 6, *FDI* is not significantly associated with the *REER*. There is a possibility that in the short run *FDI* inflow might lead to appreciation of *REER* when the economy receives this flow. With the passage of time; however, when foreign capital outflows from the country in the form of payments made to foreigners on account of repatriation of profits earned on *FDI*, imported machinery and raw materials then it waters down the initial appreciation of the currency. Besides the production gains achieved from the *FDI* inflow also put downward pressure on prices, consequently depreciation of *REER* will improve competitiveness.

The other investment has positive and statistically significant impact on *REER*. These flows are the liabilities of both the private and public sectors. If this investment is used in financing of the non-tradable, such as building houses, golf courses, etc., then it creates the problem of appreciation of exchange rate. On the other hand, if like *FDI*, it is directed towards productive activities, then it may not cause real exchange rate appreciation, it may depreciate it.

Income flows comprise of mainly the interest paid on public debt and net revenue on investments abroad (both direct and portfolio). Foreign exchange earned by a country through investment abroad can be either reinvested or used for consumption purposes. In this case, investment income might not affect the *REER* but developing countries like Pakistan; the possibility of reinvestment of earned income is low.[9] This could be one of the reasons of significant and appreciating impact of investment income on *REER*.

[9] See, Bakardzhieva, *et al*. (2010).

Table 6. Long Run Estimates of the Real Effective Exchange Rate

Regressor	Coefficient	Std.Error	t-Statistics	Prob.
C	4.8988	0.6767	2.7467	0.0121
FDI	-0.0184	0.0197	-0.3550	0.7261
OI	0.0354	0.0046	2.8946	0.0087
INI	0.1111	0.0213	1.9808	0.0609
ODA	0.1058	0.0163	2.4692	0.0222
REMITT	0.0294	0.0061	1.8189	0.0832
LGCON	-0.7113	0.0658	-4.1044	0.0005
LTOT	0.3477	0.1193	1.1055	0.2815
LTOP	-0.0254	0.0865	-0.1113	0.9124
R-squared	0.7292	Akaike info criterion		-3.4105
Adjusted R-squared	0.5358	Schwarz criterion		-2.7139
Durbin-Watson stat	1.9161	F-statistic		3.7703

Remittances are also having significant and positive impact on the *REER*. Remittances unlike other flows have no obligation associated. Given the supply of non-tradable goods, if the demand for non-tradable goods increases due to the receipt of remittances is expected to increase inflation, alternatively it can be said that on the one hand spending effect is associated with the increased level of remittances and this spending effect raises the relative price of non-tradables and in turn causes the *REER* appreciation.

Our results also predict 0.11 percent appreciation in *REER* brought out by one percent increase in *ODA*. This can be due to the reason that demand for both imports and non-tradable goods such as health care and education goes up because of increased aid. But, if the government spending of aid is more on imports then macroeconomic variables such as the exchange rate, the interest rate, or the price level are not affected. According to Adam (2005), there is large propensity to consume goods and services produced at domestic level by the public sector than the private sector. As non-tradable are supplied only by the domestic producers, if the supply does not match the demand then prices

of non-tradable goods go up relative to price of tradable goods. Accordingly, the appreciation of real exchange rate takes place.

Table 7. Error Correction Model for the *REER*

Regressor	Coefficients	Std. Error	t-Statistic	Prob.
C	-0.0316	0.0062	-5.1026	0.0000
D(LREER(-2))	-0.1835	0.0983	-1.8667	0.0721
D(ODA(-2))	-0.0070	0.0072	-0.9771	0.3366
D(INI)	0.0234	0.0071	3.2873	0.0027
D(REMITT(-2))	0.0105	0.0046	2.2705	0.0308
D(LTOT(-2))	0.1634	0.0837	1.9510	0.0608
D(LTO)	-0.1325	0.0659	-2.0088	0.0540
ECM(-1)	-0.3075	0.0384	-8.0142	0.0000
R-squared	0.751414	Akaike info criterion		-3.928431
Adjusted R-squared	0.69141	Schwarz criterion		-3.580125
Durbin-Watson stat	2.110957	F-statistic		12.52281

As far as the government consumption is concerned, we have negative but statistically significant coefficient pointing towards the depreciation of the *REER*. This could be the case, when financing its expenditures, government adopts the policy of tax increase. The tax increase in turn causes the reduction in personal disposable income. This may lead to decline in the demand for both non-tradable and tradable goods. The relative price of non-tradable declines as a result of decreased demand, in the face of given world prices of tradable and as a result *REER* appreciates. Also, fiscal balance is going to be deteriorated by an increase in government spending and therefore puts downward pressure on the exchange rate.[10]

After developing the association between capital flows and *REER*, we now investigate the short run dynamics of *ARDL* model. Estimate of short run that are received from the error correction method (*ECM*) are reported in Table 7. *ECM* depicts how gradually or quickly variables converge to the equilibrium, alternatively this term represents

[10] Afridi (1995).

the speed of adjustment to re-establish the stable equilibrium in the short run model. The sign of the *ECM* should be negative with the high level of significance. The negative sign of ECM_{t-1} with the high level of significance in our analysis confirms that long run relationship can be obtained. For the short run modem, the coefficient of the ECM_{t-1} is -0.30 and is significant. This indicates that long term deviation in *REER* is corrected by 30.75 percent every year.

Table 8. Diagnostic Test

LM Test Statistic	F-Statistics	Prob.	χ^2
Jarque-Bera	1.870003	0.3925	5.99
Serial Correlation	1.584548	0.2235	3.84
ARCH	0.380776	0.5413	3.84
Ramsey RESET	3.066535	0.0909	3.84

Diagnostic tests are reported in Table 8. We find no evidence of hetroskedasticity, serial correlation, non-normality and misspecification. If there exist these problems then the assumption that the disturbances are distributed $N(0, \sigma^2 I)$, i.e., mean zero and constant variance is violated.

4.3. CUSUM and CUSUMQ Test of Stability

Furthermore, stability of the parameter is also checked through applying the Cumulative Sum of Recursive Residuals (*CUSUM*) and the Cumulative Sum of Squares of Residuals (*CUSUMQ*). This test is suggested by Brown, *et al*. (1975). In this test cumulative sum are plotted against the 5 percent critical lines. If the plot of cumulative sum crosses these critical lines then the parameters are found to be instable.

Figure 4. Cumulative Sum of Recursive Residuals

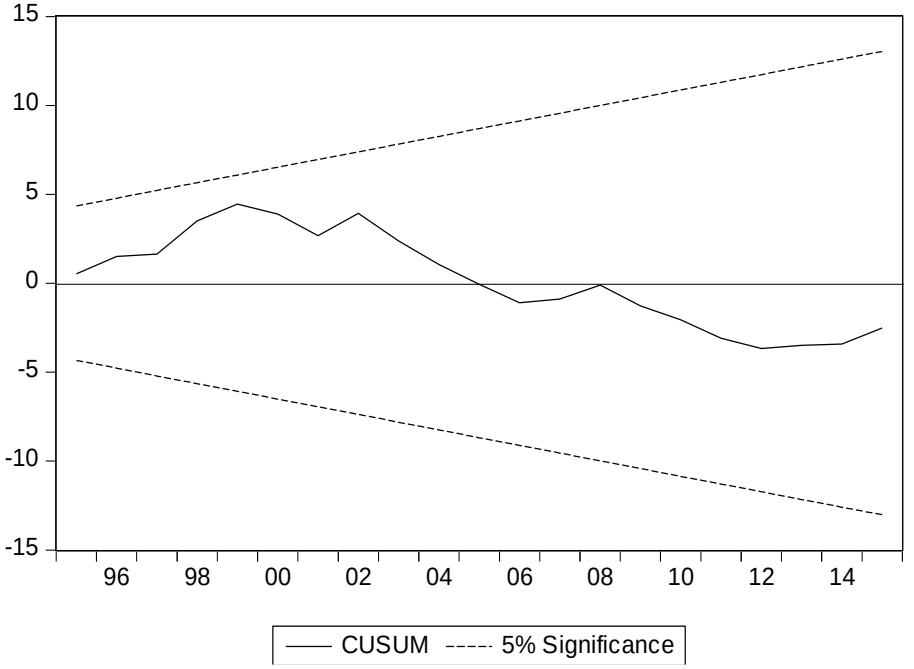
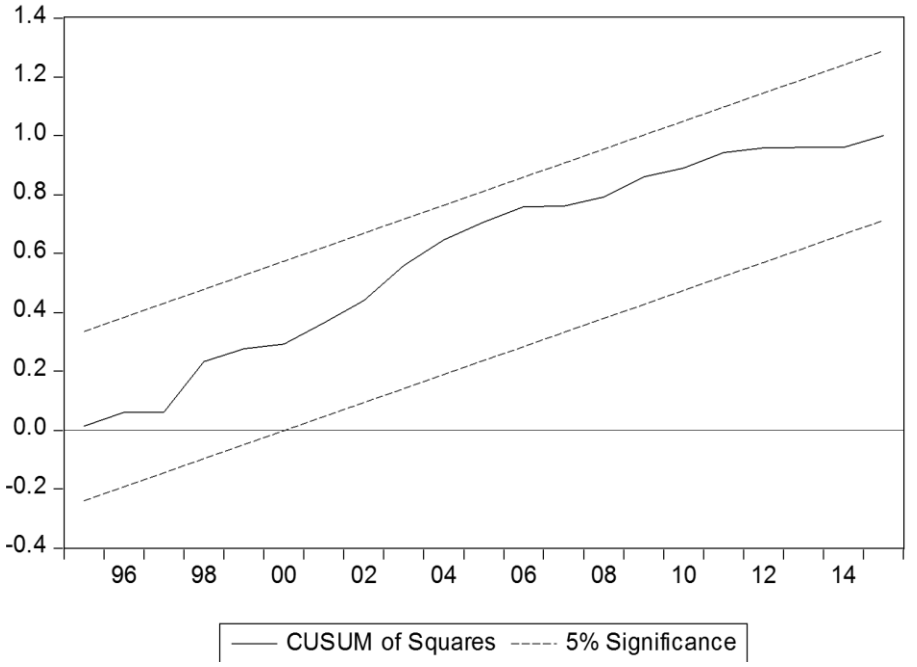


Figure 5. Cumulative Sum of Square of Residual



To achieve this objective, the *CUSUM* and the *CUSUMSQ* are plotted and given in Figures 4 and 5. From the plot, it is evident there is no significant structural instability as none of the straight lines goes outside the critical lines.

5. CONCLUSION

In this paper, the international competitiveness of the Pakistan economy is done through analyzing the changes real effective exchange rate caused by capital inflows along with some important policy variables. A positive and significant impact of most of the capital flows on *REER* turns out as the main finding of the study. In the light of this result, it can be said that both in the short and long run capital flows are linked with the real appreciation of national/domestic currency. Thus, the outcomes of the study indicate that foreign capital flows have harmful effect on competitiveness via exchange rate appreciation.

In the light of these findings the paper concludes that policymakers face a number of problems in the context of a surge in capital flows. At least two points of concern are worth noting: first, real exchange rate appreciation adversely affects export oriented industries of Pakistan who may find it difficult to compete internationally. Even a subsequent depreciation may not be very helpful in regaining the lost strength. Second, a sudden real appreciation may not allow export firms to adjust quickly, and therefore brings in a very painful adjustment. Hence, to offset the adverse effect of capital flows on the economy, the following measures are recommended:

1. Policy of sterilization may be more frequently adopted by the central bank.
2. Capital inflow should be utilized in such a way that it improves the performance of the export sector, say to import appropriate technology and intermediate inputs.
3. Implement policies to reduce labour costs to shed adverse effects on the tradable sector.

APPENDIX-I:

Real Exchange Rate:

Real exchange rate is the nominal exchange rate that is adjusted for the price differences between the foreign and domestic country. It is a measure of prices of one country's goods and services relative to the prices other country's goods and services. For small open economy this measure can be used as an indicator of economy's competitiveness. An appreciation of this index shows an increase in the domestic cost of producing goods and services and implying that now this country is producing goods less efficiently as compare to the rest of the world. *RER* is defined as

$$RER_d = eP^f / p^d \qquad ...(A1)$$

where,

e is the nominal exchange rate

p^d is domestic price level

p^f is foreign price level

We have two definitions of real exchange rate. Home and foreign price levels are measured by price indices. We can use different price indices in order to measure the real measure exchange rate. Choice of the price indices that we are going to use depends upon the purpose of the study.

Real Effective Exchange Rate: (*REER*)

In order to work out the *REER*, we first have to identify a range of countries as major trading partners, their weights in total trade (exports and imports) and the price indices.

The effective component of the *REER* (Major Trading Partners):

In computing the *REER*, all the trading partners that compete with the domestic producer either directly or indirectly are going to be considered. But there are some constraints pertaining to data availability that restricts the number of trading partners. If the chosen partners cover most of the trade then the influence of the excluded partner on the

exchange rate should be marginal. We restricted ourselves in selecting only 16 partners. The highest percentage of trade that these partners cover is 70.85549 in 1985 and the lowest percentage cover by these countries is 40.6292 in 2006.

Table-I. Trade weights of Major Trading Partners

Trading partner	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**
Kuwait	0.066	0.113	0.083	0.094	0.052	0.108	0.045	0.099	0.101
Saudi Arabia	0.102	0.098	0.135	0.054	0.061	0.096	0.126	0.150	0.158
Iran	0.033	0.025	0.024	0.026	0.02	0.012	0.017	0.046	0.011
USA	0.163	0.139	0.168	0.198	0.189	0.234	0.222	0.197	0.214
Canada	0.034	0.021	0.017	0.017	0.024	0.022	0.017	0.024	0.026
Belgium	0.025	0.02	0.016	0.022	0.025	0.027	0.022	0.027	0.032
France	0.033	0.059	0.028	0.038	0.043	0.043	0.172	0.030	0.031
Germany	0.095	0.081	0.081	0.114	0.105	0.079	0.07	0.078	0.084
Italy	0.04	0.059	0.041	0.044	0.065	0.032	0.042	0.047	0.043
UK	0.09	0.087	0.086	0.086	0.091	0.079	0.063	0.064	0.086
Japan	0.156	0.157	0.183	0.164	0.127	0.078	0.072	0.065	0.073
Switzerland	0.011	0.018	0.018	0.024	0.023	0.033	0.02	0.015	0.012
Australia	0.061	0.022	0.03	0.031	0.024	0.04	0.03	0.027	0.021
Malaysia	0.036	0.029	0.053	0.033	0.08	0.041	0.033	0.077	0.045
Singapore	0.015	0.027	0.02	0.025	0.024	0.027	0.019	0.034	0.050
Hong Kong	0.042	0.045	0.016	0.03	0.048	0.049	0.029	0.021	0.014

Source: Statistical Supplement: Direction of Trade Statistics, IMF (various issues).

The countries chosen are Kuwait, Saudi Arabia, Iran, USA, Canada, Belgium, France, Germany, Italy, UK, Japan, Switzerland, Australia, Malaysia, Singapore and Hong Kong, as major trading partners of Pakistan.

Computation of Weights:

Weights capture the trade flows between the domestic country and the foreign countries. The trade flows between the home country and country i is equal to the sum of imports and exports to country i as a proportion of the home country's total trade flows that is represented by the formula as:

$$\omega_{it} = X_{it} + M_{it} / \sum_{1}^{k} (X_{jt} + M_{jt}) \qquad ...(A2)$$

Such bilateral trade weights of this sort fail to capture indirect competition from trading partners, there by understating the degree of competition faced by domestic producers. *REER* indices calculated using weights to capture third party competition have been found to have significant impacts on the measures.

where, $\sum_{1}^{k} (X_{jt} + M_{jt})$ represents total trade between the home country and all trading partners while $X_{it} + M_{it}$ represents trade between major trading partner *i* and domestic country in time period *t*. ω_{it} represents the trade weight between the trading partner and domestic country.

REER by using the geometric mean method can then be calculated as:

$$REER_{d,t} = \prod_{i-1}^{k} (R_{i,t} / R_{i,0})^{\omega_i} \qquad ...(A3)$$

These two ways of averaging has significant impact on the index. The major advantage of the AM is lies in its ease of computation while the GM is not easy to compute but one of the most important properties of the GM is its symmetry and consistency.

APPENDIX-II
Table-II

Variable	Description	Units	Source
FDI	Foreign direct investment	Million US Dollar	Handbook of Statistics(SBP)
OI	Other investment	Million US Dollar	IFS
INI	Investment income	Million US Dollar	Handbook of Statistics(SBP)
REMITT	Remittances	Million US Dollar	Pakistan Economic Survey
ODA	Long term government loans	Million US Dollar	Handbook of Statistics(SBP)
GCON	Government Consumption	Current prices, Million Rs.	Pakistan Economic Survey
TOT	Terms of Trade (unit value of exports/ unit value of imports)	Index	IFS
TOP	Trade Openness [(exports + imports)/GDP]	Current Prices, Million Rs.	WDI

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