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Pakistan's Accumulation of Foreign Exchange Reserves during 2001-2006: Benign or Hostile! Excessive or Moderate! Intent or Fluke!

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Abstract

Excessive accumulation of foreign exchange reserves has emerged as an incredible monetary tool particularly after the East Asian crisis of 1997 which somehow seems able not only to stimulate economy but also to stabilize most vulnerable variables like exchange rate, debts and deficits. However there is a dire need to investigate the impacts of this strategy on the financial and economic performance of a country.

We analyze the economy of Pakistan during the period of 2001-2006 with reference to the probable use of reserves accumulation as a monetary tool and find convincing evidences that reserves were being accumulated excessively in that period and impacted successfully in stimulating GDP's, Exports' and Imports' growth; stabilizing exchange rate; and reducing debt burdens and deficits. However, it is not evident that this strategy was designed and implemented intentionally by the monetary authorities following in the footsteps of other economies of the region. It rather seems to be a spontaneous policy or a fluke generated as an aftermath of 9/11 attacks that actually led to the strong capital inflows in the country by way of remittances and net foreign factor income.

Keywords: Foreign exchange reserves, Excess reserves, Reserves accumulation, Exports led growth, Mercantilism

1. Introduction

Since the 1997-1998 Asian financial crises, monetary authorities of East Asian emerging economies have increased more than twice their stashes of foreign exchange reserves; by the mid of 2007 the total foreign reserves holdings of China, Japan, Taiwan, South Korea, Singapore and Hong Kong was about more than $3000 billion. The domain of possible reasons for that unusual increase in International Reserves includes self-insurance against the output costs of sudden stops, precautionary demand, financial anxieties, sovereign risk, volatile and limited tax capacity and a modern incarnation of mercantilism. There are strong evidences that excess reserves have significant role in reducing the volatility of exchange rate and in fostering the economic progress of a country. They can also provide safeguard against the costly liquidation of earlier investment due to sudden stops or capital outflows and thus reduce the speed of current account adjustment and increase its persistence [Aizenman and Lee (2005)].

There is a dire need to investigate the impacts of reserve accumulation strategy on the economic and financial performance of a country. In this paper we focus on the economy of Pakistan, where foreign exchange reserves have been increased more than 6 times in just a period of 5 years from 2001 to 2006 and the economy has experienced a miraculous growth in almost all major economic indicators.

The remainder of this paper is as follow. Section 2 provides some basic facts to develop the argument related to the existence of excessive reserves; section 3 provides motivations to accumulate excessive reserves on the basis of existing available literature; section 4 introduces major criteria to assess the adequacy of reserves. In section 5 we analyze the economy of Pakistan and observe growth patterns of different macroeconomic indicators over the past 26 years. We find that most of these variables have shown miraculous growth after 2001 including foreign exchange reserves and they are found to exceed the benchmark levels of reserves adequacy, provided by IMF, during the period of 5 years from 2001 to 2006. It is not yet confirmed that whether it was a policy tool by the Govt. of Pakistan to accumulate reserves excessively on the footsteps of many other east Asian countries or it was an after math of 9/11 which forced many Pakistanis, settled abroad, to shift their capital towards their home country that eventually triggered the excessive accumulation of foreign exchange reserves. Section 6 concludes the paper.

2. Factual Backgrounds

The excessive accumulation of foreign exchange reserves in emerging economies is one of the most debatable issues among the community of economic policymakers. History of past thirty years shows that shift in exchange rate regime (from fixed to flexible) and increasing ability to borrow in domestic currency relieved pressure on many industrial countries to hoard foreign exchange reserves. While at the same time, emerging and developing economies continued to struggle with maintaining adequate reserve levels, however, recent large scale building of foreign exchange reserves especially in emerging economies raised many queries about the necessity and rationale behind this strategy.

According to the beliefs of many economists, the South Asian Crisis of 1997 was the trigger in compelling emerging economies to accumulate excessively their foreign exchange reserves, and if we analyze the simple empirical data over the period of 12 years from 1996 to 2007, this argument sounds quite strong.

Table 1: Largest Reserve Accumulating Economies (2007)

Rank	Central Bank/Monetary Authority	Reserves in Billions $
1	China	1202
2	Japan	909
-	Eurozone	450
3	Russia	357
4	Taiwan	267
5	South Korea	244
6	India	203
7	Singapore	137
8	Hong Kong, China	135
9	Brazil	116
10	Germany	115
11	France	102
12	Malaysia	87
13	United Kingdom	84
14	Italy	80
15	Algeria	78
	Total	***4566***

Source: United Nations Reports 2008

Table 2: Accumulation of Reserves in Emerging Economies (Billions $)

Position	Countries	2007	2002	1996
1	China	1202	291	107
2	Japan	909	461	217
3	Taiwan	267	162	88
4	South Korea	244	121	34
5	Singapore	137	82	77
6	Hong Kong, China	135	112	64
	Total	***2894***	***1229***	***587***

Source : Department of Investment Services in Taiwan

From the above data and tables once can easy conclude that since the 1997-1998 Asian financial crises, monetary authorities in emerging East Asian economies have increased more than twice their stashes of foreign exchange reserves; Of these countries, China, Japan, Taiwan, Hong Kong, South Korea, and Singapore were the world's biggest holders of foreign exchange reserves in 2007-- by the end of 1996 they held $587 billion, which were increased to the level of $1229 billion by the end of 2002, and the cumulative value by the end of 2006 or in the first quarter of 2007, of these reserves was approximately $2894 billion which represents an increase of 4.93 times or 493% from 1996 to 2007. The domain of possible reasons for that unusual increase in international reserves

includes self-insurance against the output costs of sudden stops, precautionary demand, financial anxieties, sovereign risk, volatile and limited tax capacity and a modern incarnation of mercantilism.

3. Motivations to Hold Excessive Reserves

Each country is different from others in numerous ways; for example geographical location, size of population, wealth, political regime, phase of development, weightage in international business, and so on. But despite of these entire distinguishable factors, one thing that we see common in almost all countries of modern age is their requirement of holding foreign exchange reserves. It doesn't matter that the country is small or large, or how much trade openness exist in that country, holding of international reserves is something which is inevitable for almost all. In many cases, we see that the official reserves are a major national asset. Even in the rich and developed countries that have their own strong currency, international reserves are important determinant of their GDP, while in some small and emerging economies their contribution towards growth is much higher.

Traditional justifications for the accumulation of foreign exchange reserves include formal backing for the domestic currency, tool of exchange rate and monetary policy, debt servicing, payment of overseas expenditures, provisions against emergencies or disasters and investment. But beside the mentioned above there are some other factors that could be the probable justification for the adoption of the policy of accumulating reserves such as impact of foreign exchange reserves on the volatility of real exchange rate, self insurance, current account persistence and the most controversial; incarnation of mercantilism.

Aghion, Bacchetta, Ranciere and Rogoff (2006), found that real exchange rate volatility is harmful for the growth of a country and reduces it, this problem would be more severe in countries having less financial development. So the factors that can reduce the volatility of real exchange rate are very important for any country.

Aizenman J. and Riera-Crichton D. (2007) used the following regression to estimate the volatility in real exchange rate due to the terms of trade shocks and to capture the impact of international reserves in the magnitude of real exchange rate volatility.

$$\ln(REER_{it}) = \alpha_{1,i} + \alpha_1(TO * \ln(TOT))_{it} + \alpha_2(TO * \ln(TOT) * RES)_{it} + \varepsilon_{it}$$

Where $\ln(REER_{it})$ is the log of the real effective exchange rate (REER), defined so that a higher REER indicates appreciation in real terms. The term $\alpha_{1,i}$ represents country fixed effects; TOT is the terms of trade, $TO = \ln\left[1 + \left(\frac{IM + EXP}{2\,GDP}\right)\right]$ is a proxy for trade openness and $RES = \ln\left[1 + \frac{IR}{GDP}\right]$ is a proxy for the International Reserves/GDP.

From the above regression they calculated the elasticity of real exchange rate with respect to the term of trade shocks as given below;

$$\frac{\partial \ln(REER)}{\partial \ln(TOT)} = TO(\alpha_1 + \alpha_2 * RES)$$

which clearly indicates that elasticity with respect to shocks is depending upon the hoarding of international reserves measured by the proxy of IR/GDP. The main finding of the above study was that higher IR/GDP is associated with a lower real exchange rate volatility.

Aizenman J. and Riera-Crichton D. (2007) also believe that accumulation of international reserves may generate a self insurance mechanism in case of adverse terms of trade and liquidity shocks, and thus it can not only reduce the adverse effects of TOT volatility on the GDP but can also smooth the adjustment of adverse liquidity shocks. They claimed that higher International Reserves/GDP ratios are able to smooth adjustment to shocks in a greater capacity which could lead to more persistent patterns in current account.

Ben-Bassat and Gottlieb (1992) also considered foreign exchange reserves as output stabilizers. According to them foreign exchange reserves can decrease the likelihood of an output drop provoked by the flight of capital and/or the depth of the output collapse when the sudden stop turn up. Flood and Marion (2001), Aizenman and Marion (2003), Edison (2003), Aizenman Lee and Rhee (2004) suggest that hoarding international reserves can be viewed as a precautionary adjustment, reflecting the desire for self – insurance against exposure to future sudden stops.

Dooley, Folkerts-Landau, and Garber (2003), viewed hoarding of reserves as incarnation of mercantilism, especially in the context of China, which means *"Hoarding international reserves as part of a deliberate development strategy that facilitates growth by maintaining an undervalued real exchange rate"*. They claimed that accumulation of reserves is in fact the intervention of Asian central banks whose primary objective is to prevent domestic currency from appreciation against the US dollar in order to promote export-led growth. However, Aizenman and Lee (2005) found no significant evidence of it. They used lagged values of export growth and deviations from predicted purchasing power parity in addition to the standard regressors to test the existence of mercantilism in Asian economies and found limited evidences for the mercantilist motive. It is better to say that their overall results strongly suggest precautionary demand as a primary motive behind the accumulation of reserves, even for China. [1]

4. Adequacy of Reserves

In the light of above mentioned benefits it is quite logical for any economy to accumulate foreign exchange reserves but the question is about the size of those reserves! How much reserves an economy should hold? What is the adequate level of reserves? And last but not the least, what is the cost of holding excess reserves? These questions have become

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[1] Aizenman, J. and Lee, J. (2005) "International reserves: precautionary versus mercantilist views, theory and evidence." *IMF Working Paper 05/198.*

Aizenman, J. and Lee, J. (2005) "Financial Versus Monetary Mercantilism-Long-run View of Large International Reserves Hoarding." *NBER Working Paper No.12718.*

more important after the decade of 1990 during which the world experienced many financial crises and in result some countries accumulated such a massive levels of foreign exchange reserves which were far above the conventional benchmark of reserve adequacy. [Green and Torgerson (2007)]

4.1 Import Coverage Ratio

Conventionally countries hold foreign exchange reserves to manage the demand and supply of foreign exchange eventually to settle their current account transactions and the classical rule of thumb for monetary authorities is that there should be just enough Reserves which are equivalent to three months of Imports.

4.2 Reserves/Short term Debt

Second benchmark for the adequacy of reserves is Guidotti-Greenspan rule, described by Stanley Fischer (2001) while providing policy guidance to emerging economies which requires that country with significant but uncertain access to capital markets can hold reserves equal to short-term debt at the start. However, countries may need to hold reserves more than their short-term debt due to many reasons for example; differences in macroeconomic fundamentals; the structure and quality of private risk management and financial sector supervision; the exchange rate regime; and the size and currency composition of the country's external debt.

4.3 Reserves/ M2 Ratio

According to this benchmark, reserves equal to 5 – 20 percent of M2 are adequate for the economies which need to increase the confidence in the value of local currency along with the reduction in the risk of capital flight.[2]

5. Analysis of Pakistan's Economy

In this section we analyze the economy of Pakistan especially with reference to foreign exchange reserves. Several questions could be asked in this regard, but we would limit our focus on three major questions:

1. The first and most important is whether the foreign exchange reserves holdings in Pakistan were adequate or excess during the period of 2001 to 2006?
2. If these holdings were excess, what was the motive behind those excessive reserves holdings?
3. And last but not the least that what was the real time impact of excess foreign reserves holdings on the economy of Pakistan?

[2] See Aizenman, Joshua and Nancy Marion, 2003, "The High Demand for International Reserves in the Far East: What Is Going On?" Journal of the Japanese and International Economies, 17(3):370-400; Edison, Hali, 2003, "Are Foreign Reserves Too High?" World Economic Outlook, IMF, September; and Gosselin, Marc-André and Nicolas Parent, 2005, "An Empirical Analysis of Foreign Exchange Reserves in Emerging Asia," Bank of Canada Working Papers No. 05-38.

5.1 Miraculous Improved Economic Performance

Starting in a reverse order we first analyze what was the general state of economy during the period of 2001 to 2006 and was the behaviour of different macroeconomic indicators different from their long term trends.

By looking above two figures carefully, one can easily observe that after a long declining phase of economic growth which covers the whole decade of 1990, economy suddenly got boost up in 2001-02 and then showed consistent economic growth till 2006, both in real and nominal terms.

Figure 1(a)

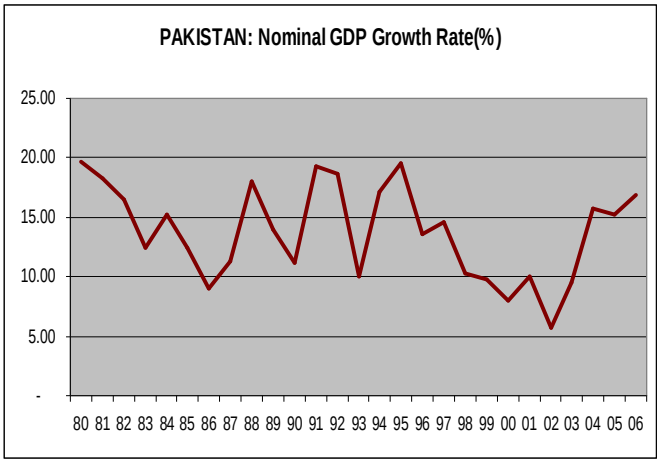


Figure 1(b)

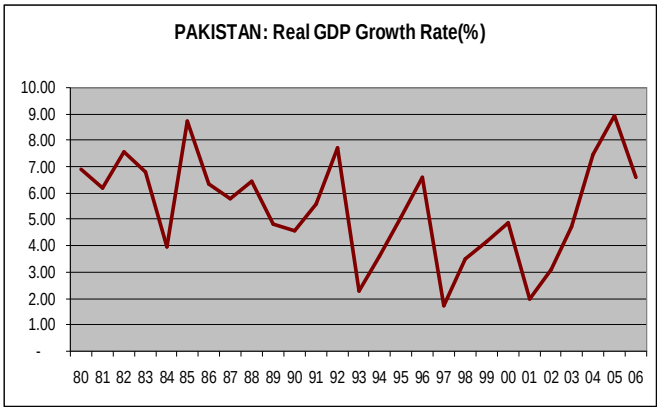


Figure 2(a)

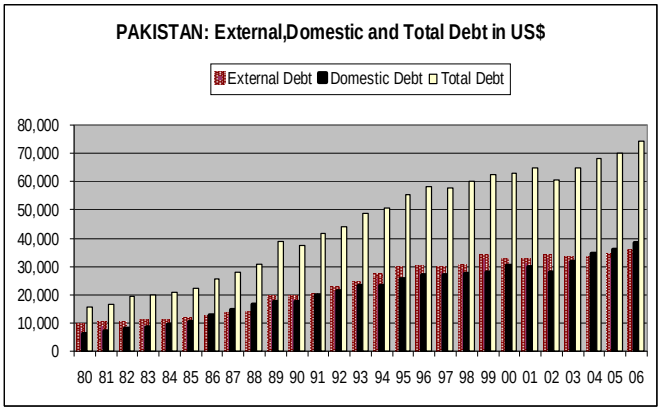


Figure 2(b)

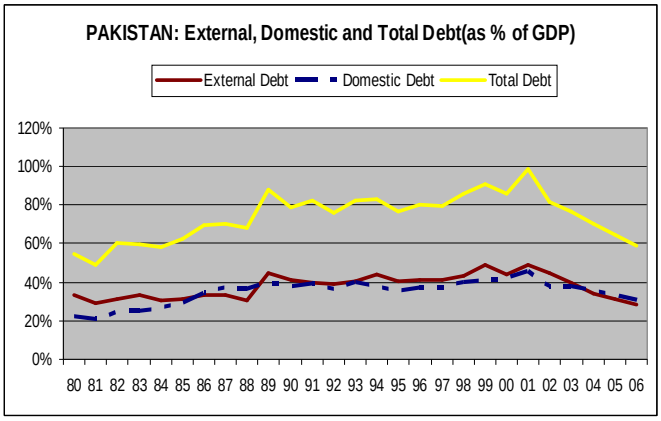


Figure 2(a) shows external, domestic and total debt burden in dollar value, and all three variables are showing consistent increasing trend over the passage of time, but if we look at figure 2(b) in which these variables are shown in terms of percentage of GDP, sudden decreasing trend is quite visible after a long persistent phase of slow growth in debt burden. This reduction in debt burden is starting after 2001-02, and is an indication of better performance reflected by the higher proportionate increase in the size of economy(GDP).

Per capita income has also been increased by about 66 percent within the span of 4 to 5 years, and the starting point of this enormous growth is again 2001-02.

Figure 3

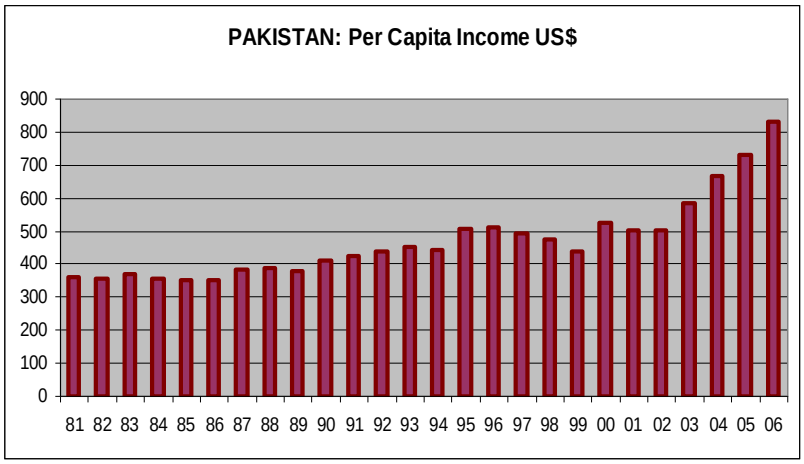


Figure 4(a)

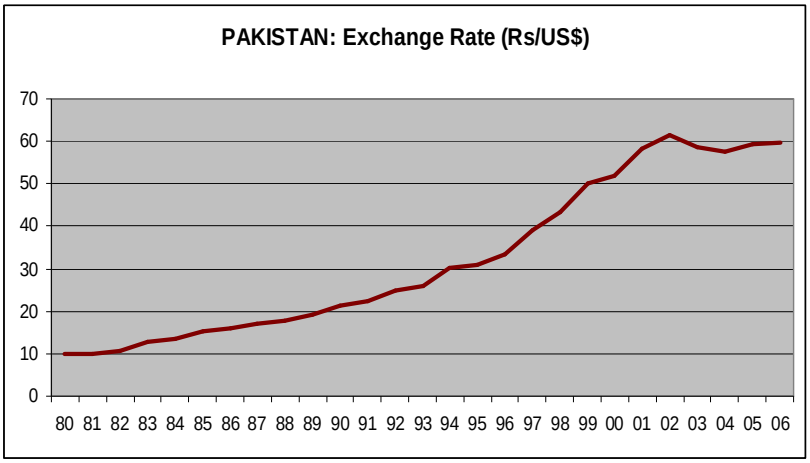
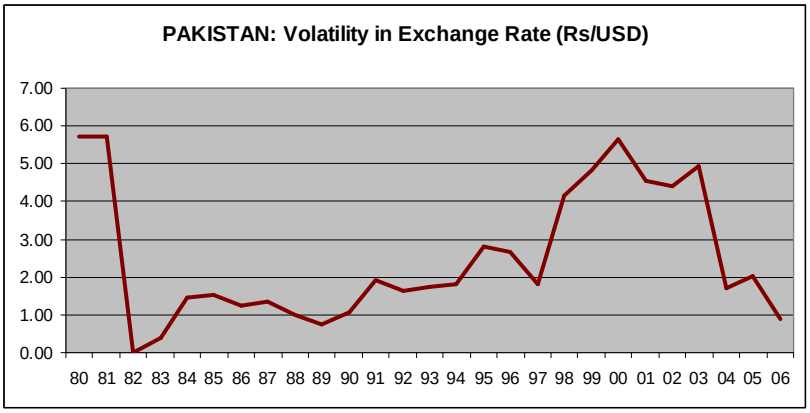


Figure 4(b)



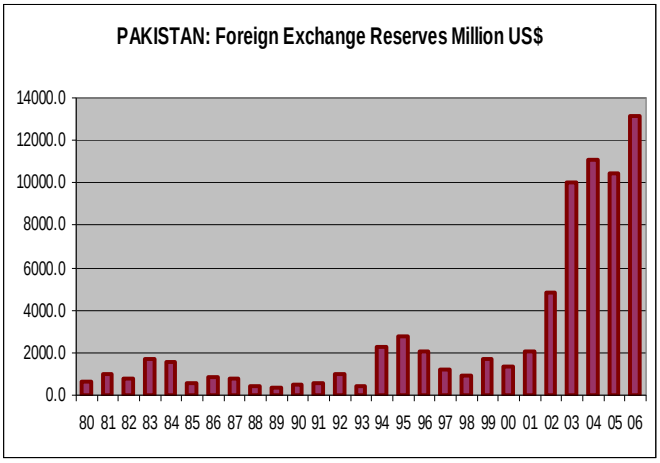
Sudden stop in the increasing momentum of exchange rate (Figure 4a) and decreased volatility[3] in exchange rate between Pak rupee and US dollar (Figure 4b) clearly point out that the local currency is not only stabilizing rather strengthening after a long period of time, and it is important to mention that this era of persistent and stable exchange rate also seems to be started in 2001-02.

5.2 Are Foreign Exchange Reserves the Missing Link?

So far we have strong evidences that the economy of Pakistan had entered in a better performing phase in 2001-02 and were enjoying the high levels of economic growth and stabilized economy till the end of 2006. Of course this improved performance and stability was not the result of a miracle and there must have been some change in economic policies which had flipped the face of the coin and put the economy of Pakistan on the way of strength and prosperity. Now the question is if such an unexpected growth was not the result of a miracle than what was the actual factor behind it.

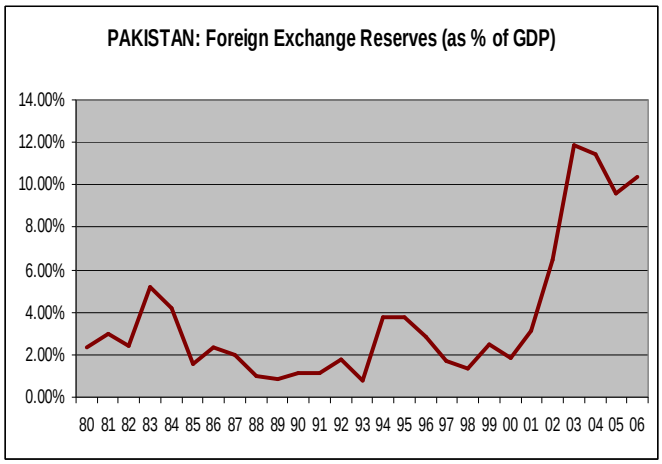
Our argument is that it was the same model which had been adopted by the south Asian countries after the financial crisis of 1997, to stimulate their economic growth; i.e. excessive accumulation of foreign exchange reserves.

Figure 5(a)



[3] Volatility of exchange rate is measured by 3 years moving standard deviation

Figure 5(b)



Figures 5(a) and 5(b) clearly indicate that growth in foreign exchange reserves of Pakistan from 2001-02 was enormous. These reserves increased more than 6 times in just a period of 5 years and the holdings of foreign exchange reserves at the end of 2006 were touching its level highest by that period.

This massive increase in foreign exchange reserves is not only in nominal terms but also in terms of percentage of GDP, and in above figures 1 and 3 we have already observed that the size of economy of Pakistan was also continuously increasing from 2001 to 2006 so the real increase in foreign exchange reserves was much greater than what one can observe apparently during that period.

Now if we relate the incredible and unprecedented growth of overall economy of Pakistan during the period 2001-2006 with the increase in foreign exchange reserve holdings, it can be claimed that this massive build-up of foreign exchange reserves has definitely something to do with the miraculous growth and stability of economy of Pakistan as it all suddenly happened during the same period of time.

There are strong evidences that excess reserves have significant impact on the volatility of exchange rate due to term of trade shocks. Higher International Reserves/GDP ratios reduce the volatility in Real Exchange Rate generated due to term of trade shocks.[4] Though we haven't adopted the methodology which is used by Aizenman but still we could reach at similar conclusion by looking at figure 4(b), mentioned previously, which shows a significant decrease in the volatility of exchange rate between Pak rupee and US$ if we assume that rate as a proxy of real exchange rate of Pakistan.

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[4] Aizenman J. (2006) "International Reserves Management and the Current Account." *NBER Working Paper No. 12734*.
Aizenman J. and Riera-Crichton D. (2007) "Real Exchange Rate and International Reserves in The Area of Growing Financial and Trade Integration." *NBER Working Paper No.12363.*

Figure 6(a) shows the positive impact of foreign exchange reserves build-up in the shape of growth of exports which is undoubtedly most controversial yet the most widely claimed motive behind the strategy of excessive reserves accumulation. Figure 6(c) also supports this argument by indicating improvements in fiscal deficit and current account balance. There is a sharp decline in current account balance after 2003 but that might be because of rapid increase in import bills (figure 6(b)) which was a result of increased oil prices all over the world during that period.

Figure 6(a)

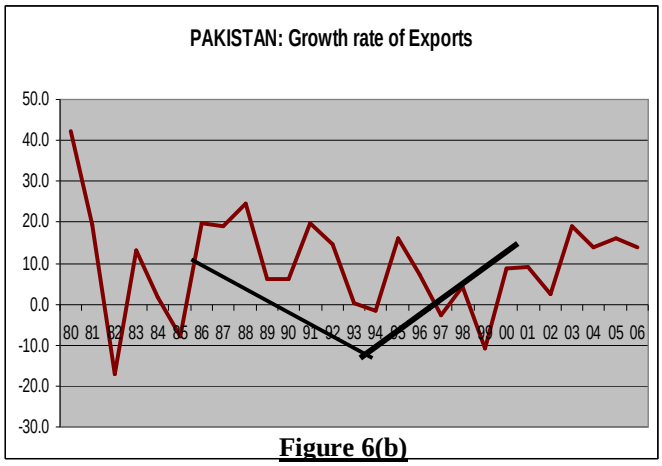


Figure 6(b)

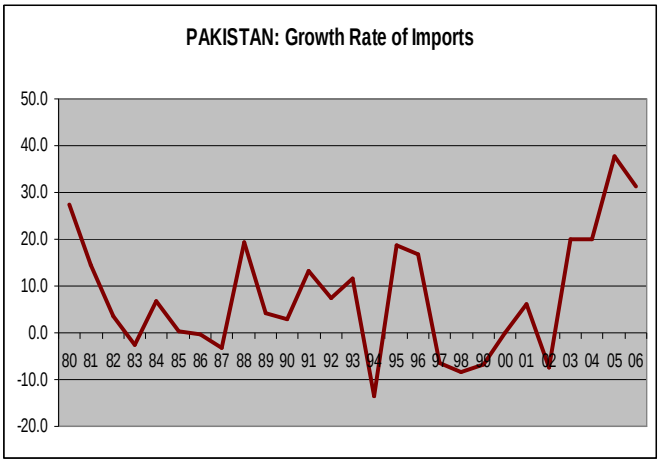
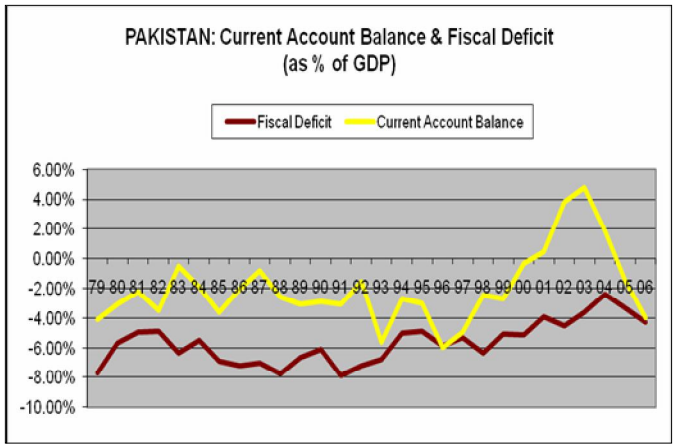


Figure 6(c)



5.4 Were Reserves Really Excessive?

Till this point we have concluded from empirical analysis that Pakistan started increasing its foreign exchange reserves after 2001-02 which in turn brought many positive signs in different economic indicators depicted by above mentioned figures. Now the question arise that whether these reserves were really excessive or not and if they were whether it was a planned decision, adopted by government to accumulate reserves excessively as it had been done by many south Asian economies after the financial crisis of 1997 to boost up their exports and to strengthen their financial sector, or these reserves were not at all surplus and were following their normal trend.

To gauge the adequacy of reserves we have three major criteria which are internationally acceptable i.e;

1. Import coverage ratio
2. Reserves to Short term debt (Guidotti-Greenspan rule)
3. Reserves to M2 ratio

The generally followed bench mark values of above mentioned criteria are given below

Criteria	Benchmark Value
Reserves/Short term debt	1
Reserves/ M2	0.05 – 0.2
Reserves/ Months of Imports	3.00

Source: IMF, BIS and national sources.
Green and Torgerson (2007) Department of Treasury, Office of International Reserves: Occasional Paper No. 6, March 2007.

Figure 7(a)

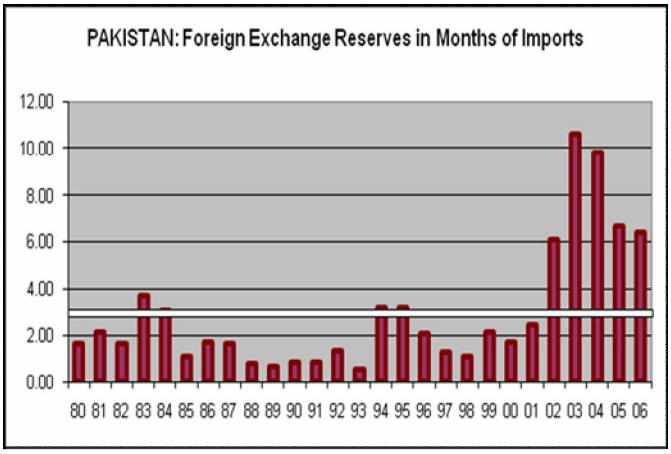
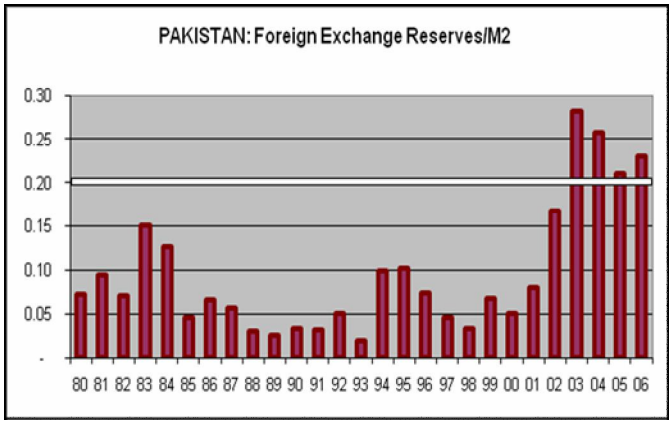


Figure 7(b)



By looking at Figure 7(a) and 7(b) we can say that according to the criteria of import coverage ratio and reserves to M2 ratio, Pakistan possessed excessive/surplus reserves after 2001-02. Figure 7(c) and 7(d) are also telling the story consistent with the previous two graphs that during the period of 2001-2006 Reserves to Short term debt ratio increased from 1 to almost 10 (ever highest by that time) against the required level of 1 according to the Guidotti-Greenspan rule. Not only that but the reserve holdings of Pakistan were about 40 percent of total external debt in 2006 which was massive compared to its value of 5 percent in 2000 and to the fact that this ratio had never surpassed the threshold of 15 percent in the history. On the basis of these three internationally acceptable criteria it can be claimed that foreign exchange reserves of Pakistan seems surplus or excessive during the period of 2001 to 2006.

Figure 7(c)

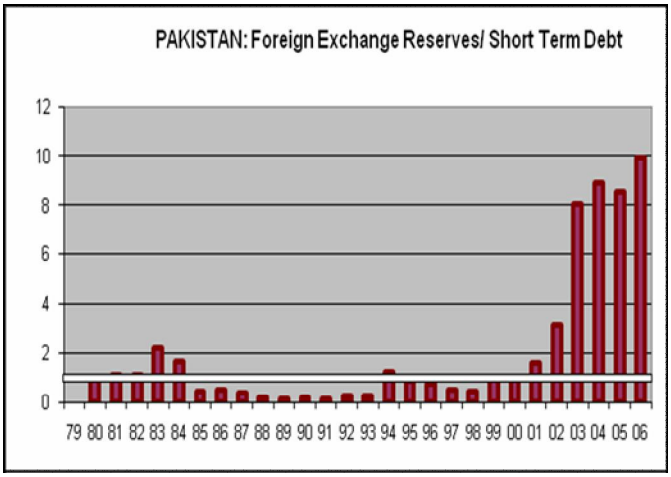


Figure 7(d)

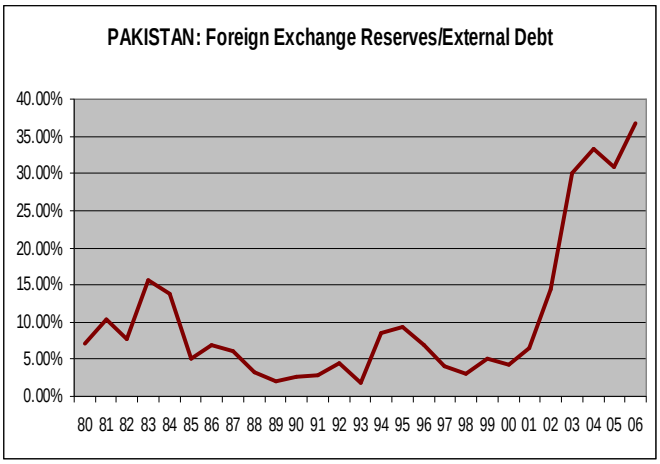


Figure 8(a)

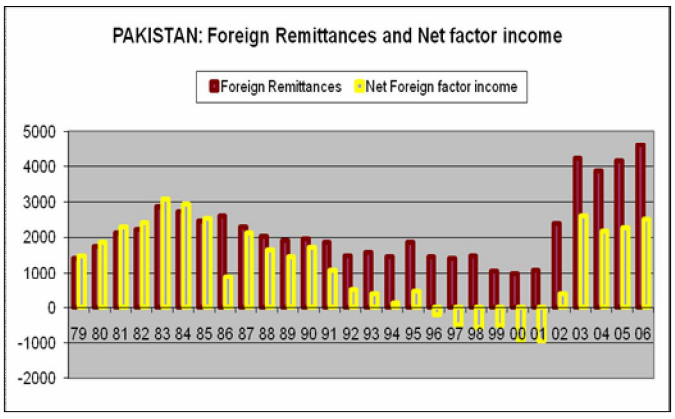
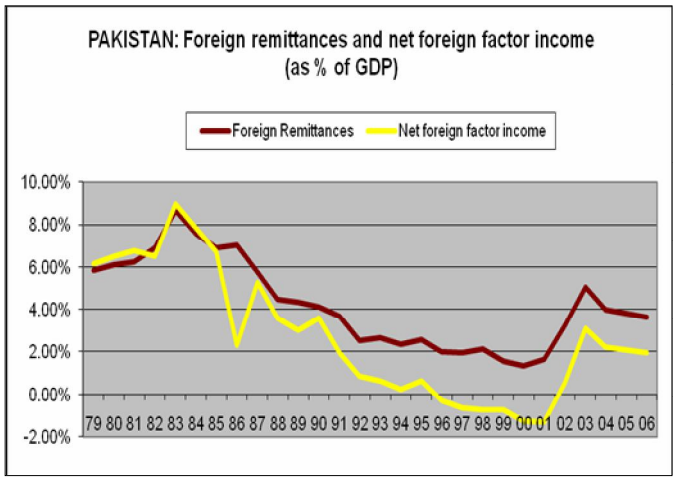


Figure 8(b)



With the help of Figure 8(a) and (b), the overall picture becomes more clear as these figures indicate almost the same pattern in foreign remittances and net foreign factor income that we already have observed in foreign exchange reserves. The probable reason for this high surge in foreign remittances and positive net foreign factor income after almost a decade of its negative values could be the incidence of 9/11 in USA. As an aftermath of 9/11 crises, a large number of Pakistani nationals who were residing abroad previously, returned back to their homeland or transferred their funds back home in the shape of foreign currency and this reverse flow of capital continued to accelerate till 2003 and after 2003 it started getting stabilize. It is also evident that a significant part of foreign exchange reserves were backed by this surge of remittances and as we do not see any official policy shift during that time period, regarding foreign exchange reserves, this could be the factor on which we can speculate as a probable driver of excessive accumulation of reserves in Pakistan.

6. Econometric Analysis

To support the above mentioned last argument we conduct some preliminary econometric analysis to test the hypothesis of statistical significance for the coefficients of Net foreign factor income and remittances in determining the accumulation of foreign exchange reserves. We run the first regression

$$LFRes\_GDP = \alpha + \beta_1 M2\_GDP + \beta_2 Imp\_GDP + \beta_3 STDebt\_GDP + \beta_4 NFI\_GDP + \beta_5 Rem\_GDP$$

Eq 1

Where LFRes_GDP is representing the liquid foreign exchange reserves as a percentage of GDP being a dependent variable, M2_GDP, Imp_GDP and STDebt_GDP are included as control variables. M2_GDP and STdebt_GDP are representing the ratio of broad money and short term debt to GDP and used as proxies of capital account vulnerability; whereas Imp_GDP is the ratio of Imports to GDP and added to capture the current account vulnerability.

The results of equation 1 are provided in table 3 below and one can easily observe that Net foreign factor income is statistically significant however Remittances seems to be insignificant despite of the overall good fit and high value of adjusted r square in the

model. Insignificant coefficient for Remittances leads us to suspect the probable existence of Multicollinearity that can be confirmed if we look at the correlation coefficient between NFI_GDP and Rem_GDP which is 0.946 and highly significant. Thus we run two more regressions (2 and 3) only considering Rem_GDP and NFI_GDP one at a time and leaving all other control variables as they are.

$$LFRes\_GDP = \alpha + \beta_1 M2\_GDP + \beta_2 Imp\_GDP + \beta_3 STDebt\_GDP + \beta_4 Rem\_GDP$$

Eq 2

$$LFRes\_GDP = \alpha + \beta_1 M2\_GDP + \beta_2 Imp\_GDP + \beta_3 STDebt\_GDP + \beta_4 NFI\_GDP$$

Eq 3

The results of equation 2 and 3 are also provided in table 3 and confirm our hypothesis that both Net foreign factor income and Remittances have played important role in determining the accumulation of foreign exchange reserves as their coefficients are highly significant when consider them individually in regression 2 and 3.

Table 3

Variables	**Equation 1**	**Equation 2**	**Equation 3**
Intercept	-0.186555***	-0.181537***	-0.184404***
M2 to GDP	0.812146***	0.721113***	0.820631***
Imports to GDP	-0.635696***	-0.524441**	-0.642821***
STDebt to GDP	-0.102241	-0.181831	-0.097572
NFI to GDP	**0.583940****		**0.706880*****
Rem to GDP	**0.184488**	**0.904686*****	
Adj R Square	0.818402	0.790586	0.824711
F Statistic	24.43469***	25.53906***	31.58167***
Akaike Info Criterion	-5.665342	-5.550380	-5.728256
Schwartz Info Criterion	-5.377378	-5.310410	-5.488286
Durbin Watson Stats	2.074215	1.595444	2.200765

Note:***,**,* respectively indicates rejection of the null at 1%, 5% and 10% significance levels.

To further investigate the significance of Remittances we conduct the analysis of above variables in logarithmic form instead of taking them as a percentage of GDP.

$$\ln(LFRes) = \alpha + \beta_1 \ln(NGDP) + \beta_2 \ln(Imp) + \beta_3 \ln(STDebt) + \beta_4 \ln(Rem)$$

Eq 4

In equation 4 we added log of nominal GDP ln(NGDP) as an additional control variable and dropped Broad Money (M2). The decision is based on insignificant value of its coefficient and on the higher values of Akaike and Schwartz Info statistics of the model containing log of M2. We also dropped NFI from equation 4 because its negative values cannot be accommodated with the logarithmic transformation. Again the results are highly satisfactory (provided in table 4) and indicate that remittance elasticity of liquid foreign exchange reserves $\frac{\partial LFRes}{\partial Rem}$ equals to 0.938446 and highly significant. It is also important to consider that in all equations (percentage of GDP or logarithmic form) coefficients of imports and short term debt are consistently showing their negative expected sign that could be an indicator of robustness of our analysis.

Table 4

Variables	**Equation 4**
Intercept	-17.78677***
Ln (NGDP)	3.568934***
Ln (Imp)	-1.767319**
Ln (STDebt)	-0.677783***
Ln (Rem)	**0.938446*** **
Adj R Square	0.847097
F Statistic	37.01065***
Akaike Info Criterion	1.146465
Schwartz Info Criterion	1.386435
Durbin Watson Stats	2.186572

Note:***,**,* respectively indicates rejection of the null at 1%, 5% and 10% significance levels.

7. Conclusion

1. Pakistan started accumulating foreign exchange reserves excessively in 2001 and continued this practice till the end of 2007.
2. This strategy seems to be very supportive for the overall economy and has shown number of significant positive impact on real and nominal growth rate, growth of exports, fiscal and current account deficit, and has also contributed in stabilizing many macroeconomic indicators including exchange rate and its volatility.

3. It can be claimed that foreign exchange reserves holdings of Pakistan were excess or surplus, during the period of 2001-2006, if we consider the three criteria provided by IMF[5] to test the adequacy of reserves.

There are strong empirical evidences that excess reserves have significant impact on the volatility of exchange rate due to term of trade shocks, higher International Reserves/GDP ratios reduce the volatility in real exchange rate thus can provide safeguard against the costly liquidation of earlier investment due to sudden stops or capital outflows and it reduces the speed of current account adjustment and increase its persistence. Many south Asian countries actually experienced these benefits in real time thus making the strategy of accumulating reserves very lucrative for developing countries like Pakistan to improve their economic performance in a short period of time. Our data also suggests that Pakistan too enjoyed these benefits in the shape of increased growth in GDP, imports and exports; stability in exchange rate; and reduction in exchange rate volatility, fiscal and trade deficit and in debt burden. However, we do not find any evidence of stated shift in government policy regarding foreign exchange reserves and thus their excessive accumulation seems to us compulsive due to the aftermath of 9/11, rather than the planned which was the case in other economies of the region. We have strong econometric results in favor of this last argument in which we found remittances and net foreign factor income highly and consistently significant in determining the accumulation of liquid foreign exchange reserves.

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[5] Import Coverage ratio, Reserves to External Debt Ratio and Reserves to M2 Ratio

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