Foreign Exchange Reserve Management in India: An Analysis on Objectives and its Adequacy

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Abstract

India's Foreign Exchange Reserves have increased from US $9.220 billion (1991-92) to US $ 341.638 billion at the end of March 2015 as a result of measures introduced to liberalize the economy and the financial sector reforms in 1991. This research explores various definitions provided by researchers on the Reserve Adequacy and then attempts to find adequate level of Forex. for India . The management of excess Reserves built up for so many years is the biggest challenge for the country. Currently in India, RBI in consultation with the GOI manages the Foreign Exchange Reserves. Emphasizing on the objectives of Reserve management as liquidity and safety, this paper attempts to look at various options to utilize the excess reserves. In this paper, quantitative techniques have been used to measure the impact of various independent variables like Net Export, Foreign Direct Investment, Foreign Institutional Investment and Non Resident Deposits and their impacts on Foreign Exchange Reserves are interpreted. Thereafter, the paper looks at various practices of investing Reserves on income generating assets in emerging economies. Then, the paper recommends methods of appropriate management of reserves both for precautionary and investment purposes.

Keywords: *Reserve management, adequate Reserves, excess Reserves, regression analysis*

Introduction

The crisis of 1990 in India and early 2000 in emerging countries like Mexico, Thailand, and Indonesia etc. caught attention of financial and academic world on the importance of maintaining Foreign Exchange Reserves as a buffer to safeguard against transmission of global economic crisis (Fischer 2001). One of the characteristics of the financial crisis was rapid depletion of Foreign Reserves. Thus, in order to maintain stability, all countries started to focus on building adequate Foreign Reserves.

As countries accumulated huge Reserves of Forex. over years, researchers and educationist are concerned with the opportunity cost of holding International Reserves. Reserves are usually held in low income bearing asset such as US Treasury bills. It is debated among academia, whether or not the country should hold reserve in the form of riskless assets such as US dollar not yielding income or invest in income bearing risky assets. This paper also

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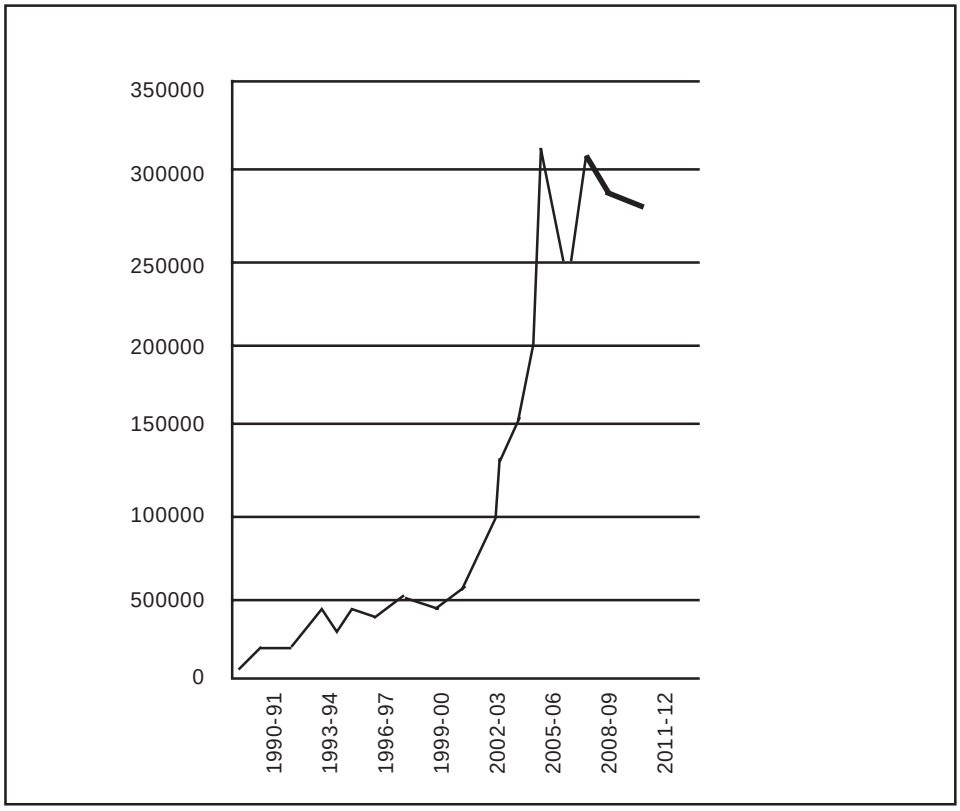
attempts to look at adequacy level of Foreign Exchange Reserves in case of India and focuses on whether the need for such build up is justified within the framework of its Reserve Management objectives. The paper also analyses opportunities of investing excess reserves on income bearing assets.

This paper is divided into five sections. Section I deals with the trend of Foreign Exchange Reserves in India, along with objectives of Reserve management. It also looks at the various sources through which India gets its foreign reserves. Section II deals with literature survey on adequacy of Foreign Reserves. Section III deals with the rising trend of Foreign Reserves in India. In this section, the statistical technique of regression analysis is used to find to what extent Foreign Exchange Reserves are driven by factors such as Net Export, Foreign Direct Investment (FDI), Foreign Institutional Investment (FII) and Non Resident Indian (NRI) deposit. Section IV discusses the various policies adopted by other countries to utilize Foreign Exchange Reserves. Finally section V suggests policies for India regarding Foreign exchange management

Section 1

India followed a restrictive external economic policy until 1991. The main aim was to conserve Foreign Exchange Reserves for essential imports like petroleum and foodgrains. However, after 1991, the Economic Policy of the country changed from import substitution to export promotion. With India adopting Current Account convertibility and gradually moving towards capital account convertibility, Foreign Investment has really gone up and consequently surplus in the capital account is contributing to build up foreign exchange reserve. As depicted in the graph 1, there is a sharp jump in foreign exchange reserves between 1999 and 2003 from $500 million to $300000 million.

Graph 1: Trend of Foreign Reserves



Source: Report on Foreign Exchange Reserves, various issues, Published by Reserve Bank of India, Ministry of Finance Government of India.

Table 1 : Statistical Analysis of Foreign reserve : Five year average with its standard deviations

	2000-2005	2006-2010	2011-2013
No of observation	60	72	32
Average	68943	228489.14	297766.09
Median	59650	250490	295050
Standard Deviation	30770.88	62188.66	23417.34
Coefficient of Variation	0.4463	0.2722	0.076

Source: Value calculated by the author on the basis of data published by RBI

Above calculations depict that foreign reserves have been constantly growing over the last decade. Foreign Reserves were highest in 2007-2008. From an average of $ 68943 million for (2000-2005), it has shot up to $228489.14 million (2006-2010) and $297766.09 (2011-2013). It can be noted that coefficient of variation is declining. From 0.4463 in (2000-2005), to 0.2722 in (2006-2010) and 0.076 in (2011-2013). Thus there is less variation in data and the reserves are becoming stable. This raises the question whether or not the policy makers should use this huge reserve in an efficient way.

Section II

Literature Review

Foreign Reserves are largely viewed as a buffer held against an uncertain outcome in the Balance of Payments. The uncertainty is largely due to current account deficits which are a common phenomenon in developing countries and particularly in India. Hence, mainly developing countries need to maintain certain level of Foreign Exchange Reserves in order to safeguard against BOP deficits. There are various opinions of what should be the adequate level of Reserves. According to Triffin (1960) 30% of Foreign Exchange Reserves at a point should be equal to the value of four months of imports. Also, the adequacy of Reserves is measured in terms of Reserves/ Import (R/M) ratio. R/M ratio indicates how long Reserves of a country can finance imports in case of CD deficit.

Fischer (2001) also emphasized the importance of import cover as an index of foreign Reserves. He suggested that 3 months of import cover through Foreign Reserves should be maintained. According to Bird and Rajan (2003) , R/M measure should be applied to countries where shock arises mainly due to Current Account Deficits . These countries face payment vulnerability due to trade related shocks and are not able to attract private capital Inflows or due to vulnerability of capital flights due economic uncertainty . India is a typical case exhibiting Current Account Deficits and unstable exports earrings. India's Exchange Reserves are mainly built up through inflows of capital through various channels mentioned earlier. Hence, India needs to have sufficient Foreign Exchange Reserves to cope up with uncertain situation in the Balance of Payments.

Table II : Ratio of three months moving average of Reserves/ Import from 2000-01 to 2012-12 In India Month/ Year

	2000 2001	2001 2002	2002 2003	2003 2004	2004 2005	2005 2006	2006 2007	2007 2008	2008 2009	2009 2010	2010 2011	2011 2012	2012 2013
April													
May	8.7	10.1	12.6	13.8	15.0	11.5	11.5	10.5	10.5	12.5	9.2	7.7	7.5
June	8.6	9.6	12.3	14.2	14.5	11.4	11.0	10.4	10.4	12.3	9.5	7.4	7.3
July	8.7	10.0	13.0	14.8	14.4	11.7	11.0	10.9	10.9	12.1	9.9	7.8	7.7
August	8.4	10.2	12.6	14.8	14.0	11.5	10.4	11.8	11.8	12.6	10.0	7.9	7.3
September	8.5	11.0	12.3	14.3	13.5	11.5	9.9	12.3	12.3	12.1	9.8	7.9	7.1
October	8.3	11.3	12.5	14.3	13.3	11.9	9.9	12.6	12.6	11.8	9.7	7.8	6.9
November	8.8	11.4	13.0	14.1	13.2	11.9	10.5	12.7	12.7	10.8	9.6	7.7	6.8
December	9.5	11.6	13.6	14.7	12.6	11.5	11.4	12.9	12.9	10.9	9.5	7.3	6.8
January	10.7	12.3	14.4	15.1	12.5	11.4	12.4	13.6	13.6	10.6	9.2	7.2	6.8
February	10.3	12.4	13.9	15.1	12.1	11.2	12.0	13.5	13.5	10.3	9.0	7.0	6.9
March	10.4	12.8	14.2	15.0	12.2	11.4	11.9	13.8	13.8	10.0	9.0	7.2	7.1

Source: Calculated by author, Source Table no 207, Hand book of Statistics on Indian Economy. Published by RBI, Ministry of Finance Government of India

Table II indicates that the ratio of three months moving average reserves to imports(R/M) is very high over the period of 2000-01 to 2012-13. The normal reserves should be able to cover three month imports. However, the table III indicates that Reserves are quite high with respect to imports. It was the highest in January-April, 2005, where reserves were 15 times of imports. On an average, it has been 9 to 10 times of the imports.

Some researchers believe that countries which carry huge amount of short term external debt, the ratio of R/M is unable to absorb payment shocks due to uncertain nature of external debt; the shock arises due to capital flight due to uncertain conditions of external commercial borrowings. Thus, in order to guard against risks of capital flights, the Reserves should be related to Short Term External Debt (STED), an important indicator for adequacy of Foreign Reserves. Pablo Guidotti- former Duty Minister of Finance of Argentina suggested that countries should manage their external assets and liabilities without foreign borrowing for a year. This came to be known as "Guidotti rule".

Over years, it has been established that STED is an indicator of crisis- risk and hence should be considered while assessing Foreign Reserves. Bird and Rajan (2003) emphasized on the fact that BOP vulnerability has changed over years. It can mainly be attributed to financial and trade openness policies which emerging countries have adopted due to WTO guidelines. Researchers believe that countries with low R/ STED ratio is likely to be vulnerable to speculative attack or external shock which can hurt investors' confidence.

R/STED fails to include the effect of withdrawal of money (capital flight) by non - residents. This effect is captured by M3 – Measure of broad money supply. Many emerging economies including India have focused more on capital account liberalization approach in response to external debt crisis. This justifies the use of broad money supply measure in assessing the reserve adequacy levels.

Table III indicates Ratio of reserves/ STED, and Reserves/ M3. As per Greenspan and Guiidotti's rule – Reserves/STED should be 100%. However analysis show, that the amount of reserves is way high than 100%. It was highest in 2003-2004. Also, Reserve/ M3 ratio is also greater than one suggesting that capital flight out of money through withdrawal by non-resident Indians is much less than Exchange reserves and hence India does not have any risk through this route.

Table III: Reserves with respect to STED and M3

Years	Reserve/STED (%)	Reserve/M3(%)
2000- 2001	1165.41	15.02
2001-2002	1971.07	17.62
2002-2003	1629.90	21.04
2003-2004	2549.29	24.44
2004- 2005	798.48	27.57
2005- 2006	776.12	24.87
2006-2007	708.07	26.23
2007-2008	659.00	30.81
2008-2009	510.37	26.78
2009-2010	533.27	22.48
2010-2011	469.02	20.93
2011-2012	376.57	20.45
2012-2013	302.02	18.95

Source: Value calculated by the author on the basis of data published by RBI

Thus, all the calculations above indicate that India is in a very comfortable position as far as foreign reserve accumulation is concerned whichever method of calculation of adequacy is taken, India has surplus reserves.

Sources of Variation

Foreign Reserves have been accumulated by East and South East Asian countries such as China through Current Account Surplus on account of export lead growth policy. In India, Reserves has been built up primarily due to Foreign Portfolio Investment and Foreign Direct Investment. An analysis of the sources of Reserves since 1991 reveals that foreign Investment contributed most to Reserves. India in an attempt to accumulate reserves and to globalize has liberalized regulation on capital inflows in various sectors including Banking and Insurance. Along with the supportive policies, strong fundamentals of the economy and real interest rate being higher than those prevailing in USA are reasons for increase in foreign reserves through the route of capital inflows.

Table IV: Sources of Variation of Foreign Exchange Reserves

	Items	2010 2011	2011 2012	2012 2013	2013 2014
1	Current Account Balance	-45.9	-78.2	-88.2	-32.4
	Capital Account (net) (a to f)	59	65.4	92	47.9
a)	Foreign Investment (i+ii)	39.7	39.2	46.7	26.4
	(i) Foreign Direct Investment	9.4	22.1	19.8	21.6
	(ii) Portfolio Investment Of which	30.3	17.2	26.9	4.8
	FIIs	*29.4*	*16.8*	*27.6*	5
	ADRs/GDRs	*2*	*0.6*	*0.2*	0.02
b.	External Commercial Borrowings	12.5	10.3	8.5	11.8
c.	Banking Capital	5	16.2	16.6	25.4
	of which: NRI Deposits	*3.2*	*11.9*	*14.8*	38.9
d.	Short-Term Credit	11	6.7	21.7	-5
e.	External Assistance	4.9	2.3	1	1
f.	Other Items in Capital Account	-14.1	-9.3	-2.4	-11.7
	Valuation Change	12.7	2.4	-6.2	-3.3
	Total (I+II+III) @	25.8	-10.4	-2.4	12.2

Source: Report, Sources of Variation of foreign Reserves, published by RBI,
Note : 1. All figures in US$ billion, 2. Increase in reserves (+) / Decrease in reserves (-).

The main source of Foreign Exchange Reserves in India is inflows of foreign investments. An analysis of investments shows that inflow of Reserves is more through portfolio investments rather than Foreign Direct Investments. As per data published by RBI, 2010-11 FDI increased by 9.4 billion while portfolio increased by 30.3 billion. Similarly in 2012-13 FDI increased by 19.8 billion as compared to increase in FPI by 26.9 billion. The total foreign investment in 2012-13 was $ 46711 million out of which Foreign Portfolio investment was $ 26891 million and FDI was $19819 million. However, in 2013-14 total investment fell down to $26386 million out which FPI was $4822million and FDI was $21564 million.

Though foreign investments are good for countries' economic growth, it is necessary to note the source of these foreign investments. Usually, FII component of foreign investments is unstable and the biggest drawback of FII is that it is pulled out in repose to stock market volatility or instability in the global financial trends. NRI deposits are also very sensitive to economic and political development. In India, these two components of Foreign Investments are the highest. To ensure financial sector stability, RBI should adopt a cautious approach towards capital inflows, especially FII from Tax Heaven.(Hemming et. al. 2003, Reddy 2004).

Some researchers believe that limited inflow of FDI is due to restrictive policy towards FDI in various sectors in India and nonexistence of full capital Account Convertibility. It must be noted that India as per WTO norms is moving towards capital account convertibility which may attract more FDI in India.

It can be observed that Current Accounts in India is in perpetual deficits. Thus, net result is that currents accounts in India bleeds reserves while capital account builds reserves. Hence, India needs to attract more Foreign investments preferably through FDI route.

Statistical Analysis on components of Reserves

Methodology: An attempt has been made to use regression analysis to ascertain contribution of various factors to Foreign Exchange Reserves in India. Reserves related to various years are taken as dependent variable while Net exports, FDI, Net Portfolio Investment and NRI deposit are taken as independent variables for statistical relationships among them.
Regression equation is set as follows:

Y= a+ b1 X1 +b2X2 +b3X3+b4 X4

Where a is called as the intercept

X1: Net Exports

X2 : Foreign Direct Investments

X3 : Net Portfolio Investments

X4 : Non Resident Deposits

a: Intercept

b1: Regression coefficient w.r.t Net Exports

b2: Regression coefficient w.r.t Foreign Direct Investments

b3: Regression coefficient w.r.t Net Portfolio Investments

b4: Regression coefficient w.r.t Non Resident Deposits

Regression Analysis on Foreign Reserve

Summary Output

Regression Statistics

Multiple R	0.938039315644979
R Square	0.879917757695701
Adjusted R Square	0.826547872227123
Standard Error	42450.3204620736
Observations	14

Table V: Inflow of Reserves, Net Exports, FDI, NRI: long term trend

Year	Reserves (US$ Million)	Net Exports (US$ Million)	FDI (US $ Million)	Net Portfolio Investment (US $ (Million)	NRI Deposits (US $ Million)
2000-2001	42281	-5976.2	3272	2590	2317
2001-2002	54106	-7586.6	4734	1952	2728
2002-2003	76100	-8692.7	3217	944	2976
2003-2004	112959	-14306.5	2388	11356	3641
2004-2005	141514	-27981.5	3713	9287	3792
2005-2006	151622	-46075.2	3034	12494	3719
2006-2007	199179	-59321.2	7693	7060	4321
2007-2008	309723	-88535	15893	27433	179
2008-2009	251985	-118401.3	22372	-143030	4289
2009-2010	279057	-109621.4	17966	32396	2922
2010-2011	304818	-118632.9	11834	30293	3239
2011-2012	294398	-183355.7	22061	17170	11920
2012-2013	292046	-190336	19819	26891	14844
2013-2014	304283	-137461	21564	4822	38406

Source: Various reports on Foreign Investment and NRI deposit, Handbook on Indian Statistic, published by RBI, Ministry of Finance, Government Of India.

ANOVA

	df	SS	MS	F	Significance F
Regression	4	118841397200.362	29710349300.0906	16.4871584409483	0.00035735825647573
Residual	9	16218267365.9947	1802029707.33274		
Total	13	135059664566.357			
	Coefficients		Standard Error	t Stat	P-value
Intercept	58987.8371265267		22480.4043047632	2.62396691477779	0.0276306263949339
Net Exports (X1)	-0.308784602544446		0.565214067375345	-0.546314432650858	0.598129970220496
FDI (X2)	7.49160770304401		3.97148822102094	1.88634770799299	0.0918705887255986
Net Portfolio Investment (X3)	2.49519191381666		1.15831485166919	2.15415688594597	0.0596319100688447
Net NRI Deposit (X4)	0.224636472498144		1.50214811749454	0.149543490340233	0.884422298458055

Y= 5897.837- 0.30878X1 +7.4916X2+ 2.49X3 +0.2246X4

Interpretation

Coefficient of Multiple Regression is 0.938 indicating a high level of relationship between Foreign Exchange Reserves and contributing factors. Since R Square is 0.8799, this means about 88% (approx) of variation in Foreign Reserves can be explained with the help of variable like net export, FDI, FPI and NRI deposits. Short term debt has not been included in the regression analysis as it is mainly covered in the Current Accounts the result is significant at 5% labour of confident limit.

Also it is noticed that the inflow of FPI is greater than FDI. However, there is a huge fluctuation in the FII inflow. Thus, while explaining the coefficient in the regression analysis, the coefficient of FDI is 7.49 and that of FPI is 2.495. This indicates that long term contribution of FII is less than FDI.

Section IV

Foreign Reserve Management: conceptual perspective

According to Gosselin and Parent (2005), the economic factors that determine Foreign Reserve accumulation can be summarized as the following:

- **Economic size**: As international transactions rise with economic size, reserves are expected to increase with population and real GDP per capita in an open economy.

- **Current account exposure:** A given economy with significant trade linkages to external markets, is more exposed to external shocks, so more trade openness would be linked with higher reserve holdings. Also, larger export volatility will require higher levels of reserves.

- **Capital account vulnerability**: Likewise, economies with significant financial openness are linked to higher vulnerability to financial crises, a greater potential for resident based capital flight from the local financial market will thus, require higher levels of reserves.

- **Exchange rate flexibility**: Greater flexibility eases the demand for reserves, given that central banks may no longer need a large stockpile of reserves to manage a pegged exchange rate. However, in reality, many countries that have adopted more flexible exchange rate regimes (including managed floats) do not allow for such variability.

• **Social (or opportunity) cost**: This is the difference between the yield on Reserves and the marginal productivity of an alternative investment of Reserves. Here, risks , liquidity and yield matrix needs to be considered for investing Foreign Reserves.

Though these factors are the determinants of foreign exchange accumulation, IMF survey (2009) indicates that countries accumulate foreign exchange reserves mainly as a buffer for liquidity needs and management of the exchange rate. Thus, management of Foreign Exchange reserves revolve around it.

Foreign Exchange Reserve Management refers narrowly to allocation of Foreign Reserves across currencies, asset classes and instruments. One aspect of reserve management is to manage risks arising out of fluctuations in foreign exchange rate to avoid speculative run on the currency as a sharp fall in exchange rate erodes the value of the underlying asset .For this RBI has to adopt a forward outlook of various currencies. India normally keeps its reserves

Table VI: Currency and Asset composition of India's Foreign Exchange Reserves from 2000-01 to 2013-14

Year	SDR (US$ Million)	Gold (US$ Million)	Foreign Currency Asset(US$ Million)	Reserve Tranche (US $ Million)	Reserves US $ Million)
2000-2001	2	2725	39554	-	42281
2001-2002	10	3047	51049	-	54106
2002-2003	4	3534	71890	672	76100
2003-2004	2	4198	107448	1311	112959
2004-2005	5	4500	135571	1438	141514
2005-2006	3	5755	145108	756	151622
2006-2007	2	6784	191924	469	199179
2007-2008	18	10039	299230	436	309723
2008-2009	1	9577	241426	981	251985
2009-2010	5006	17986	254685	1380	279057
2010-2011	4569	22972	274330	2947	304818
2011-2012	4469	27023	260069	2836	294398
2012-2013	4328	25692	259726	2301	292046
2013-2014	4464	21567	276359	1834	304223

Source: Composition of India' foreign reserves Table no 156, Hand book of Statistics on Indian Economy. Published by RBI

in US $, Euro, Pound and Yen. After the crisis of 2000, the dollar has been very volatile. Thus, if RBI does not look at option of diversifying the currency in which it holds its Foreign reserve, it may run into losses due to exchange rate fluctuation. IMF report of 2003 reveals that US$ in global Foreign Exchange reserve has declined from 67.9% to 64.8% and share of Euro has increased 12.6% to 14.6%.

Foreign Exchange reserve management by the RBI involves managing the reserve as though they are an investable pool of assets. However, it must be noted that RBI cannot behave like fund managers and shuffle its portfolio of currency and bond as maintaining stability of the currency is the key objective of foreign exchange management. Only after achieving this , excess reserves can be invested in other assets. Given below is the decomposition of foreign reserves by RBI during the last decade (Table - VI).

RBI has a conservative strategy with respect to the management of Foreign Reserves. The maximum of foreign reserves are held in securities or deposits with other central Banks. A substantial amount is also invested in Gold. This conservative strategy adopted in the management of Foreign Exchange Reserve has implication for rate of return on investment. The direct financial return on holding of foreign currency asset and gold are low.

Many countries have started to use these reserves to acquire stakes in developing countries, through investment in stabilization fund, pension fund etc. Practices of reserve management of different countries are given below.

Singapore: The reserves are managed by three agencies: The Government of Singapore Investment Corporation (GIC), Temasek Holding and the monetary authority of Singapore. (MAS). GIC is one of the leading investment management organization in the world, financing over US$100 billion in multiple asset classes in more than 40 countries. GIC groups comprises four main areas-public markets, real estate, special investment and the corporate service. GIC measures its performance in two ways. First GIC has wealth enhancement objectives, which is to achieve a real rate of return over and above G3 inflation (US, Japan and Germany). Secondly, GIC benchmarks performance of its investment group against the relevant industry.

Korea: Korea Investment Corporation (KIC) was launched with the view to boost sovereign wealth and to fund the development of domestic financial industry. KIC's main function is to invest excess public funds like foreign exchange reserves, pension funds and proceeds from privatization in various international assets.

China: In 2003, the Central bank of China (Peoples Bank of China) transferred funds from its international reserves to China Huijin Investment Company. CHIC uses its asset to purchase share in Bank of China and China Construction Bank. China Investment Corporation (CIC) is an investment institute recognized as an exclusively state owned company under the company law of the People Republic of China. Its mission is to make long term investment.

Kuwait: The Kuwait Investment Authority (KIA) is the oldest sovereign wealth fund in the world. It is accountable for the management and admin of Kuwait's General Reserve Fund (GRF) and its Future Generations Fund (FGF) as well as all other funds assigned to it by the Minister of Finance for and on behalf of the State of Kuwait. The GRF is the repository of all of the State of Kuwait's oil revenues and income earned from GRF investments which comprised of the general reserves of the State of Kuwait.

Section V

Should India follow the path of Singapore, China and other countries?

The key objective in Singaporean style of reserve management is to increase return on investment. This objective can be followed only when the reserve available is relatively larger than the size of the economy and liquidity of investment is not the only objective. In Singapore, the flow of FDI is more than FII, by the very nature, foreign reserves are more consistent. In India as pointed out the accumulation of reserves are, mainly due to FII rather than FDI. In India Current Account deficit, though currently is under control (2% of GDP), it is very volatile. When Current Account deficit is huge, the foreign reserves should cater to the need of import cover. Otherwise it may

lead to liquidity crisis. Hence, Singaporean model cannot be applied to India.

Looking at Chinese experience, CIC foreign investment portfolio is largely composed of equity, fixed income and alternative assets, in both developed and emerging markets. It has purchased shares of different banks so that liquidity increases and they can contribute to the development of the country. In India, financial institutes are very healthy with low nonperforming assets and adequate credit adequacy ratio, therefore utilization of foreign reserves as per the Chinese style is not possible.

Problem associated with Indian reserves and some recommended Supporting Polices.

The biggest problem that India faces for utilization of funds is that India's foreign reserves are high due to speculative capital inflow on Capital Account rather than current account surplus. These inflows are liabilities created by sound domestic macro conditions and global liquidity boom. They are vulnerable to sudden outflow by investors. In spite of the limitations, seeing the trend of foreign exchange in India, RBI could consider investing a small fraction of reserve after meeting the adequacy norms.

Suggestive Policies:

1. RBI can develop two funds

   a) **With the objective of precautionary motive:** Here, money kept should be in alignment with adequacy norms with respect to short term volatile speculative inflows

   b) **With the objective of maximization of wealth:** Here, money should be invested in Sovereign fund so that the return can be maximized.

The rational of this proposal is that the liquidity portfolio should have an option for regular disbursements in response to unanticipated liquidity. 2nd portion of the reserve fund would be invested mostly in highly liquid and safe assets such as the money markets of the OECD countries. However, the investment portfolio would comprise a wider set of economic investments products and maturities, and would use investment criteria akin to those of big institutional and pension funds managers.

2. RBI should consider raising the ceiling amount prevailing to Indian Corporate for takeover/ acquisition of foreign companies. Thus, Foreign Exchange should become a powerful tool in helping the Indian Multinationals to grow.

3. RBI should facilitate the industry by using the reserves to build import technology and capital good, thereby scaling up the productivity. Government of India is already working in this direction. It has removed the cap on payment of royalties and technology transfer.

4. RBI can collateralize their resources for repurchase agreements (Repo's) to fund liquidity at short notification without having to pay huge amounts of securities.

5. RBI may also include currency forwards and options to their list of financial instruments to support their currency.

6. A range of bilateral or multilateral agreements have been put in place such as credit lines or swap lines among central banks to reinforce foreign exchange reserves.

7. Government of India should invest money from the portfolio fund into Sovereign investment vehicles as: 1) Stabilization Funds;
2) Savings Funds; 3) Public pension reserve funds;
4) Government Investment Funds; 5) Government Development Funds; and 6) State-owned enterprises.

Conclusion

This paper concludes that India's Foreign Reserves are in excess of adequacy norms. On the basis of different analytical measures, the paper observes that the reserve accumulation is very high in India. By exploring various sources of variation in foreign exchange, the study finds that India attracts its foreign reserves more from Foreign Portfolio Investment rather than export driven strategy and FDI. Thus, Indian Reserves are very highly volatile. It is suggested

that India should maintain two funds out of total reserve, one with precautionary motive as a safeguard to rupee volatility and the other with wealth maximization purpose. As idle reserve is not income earing asset, the government should use excess reserve to build technology, reduce short time foreign liabilities etc. for better utilization.

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