A Newsletter of Finance Lab

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Indian Institute of Management Calcutta

Editorial

The financial markets in India have been witnessing major turmoil thanks to an announcement by the Chairman, U.S Federal Reserve that the Fed may stop buying bonds and pumping in dollars. This announcement, which has not yet been implemented, has already created havoc in the financial markets of most of the emerging economies. The foreign institutional investors have started liquidating their investments in these economies and putting the money back to the U.S. bonds in view of higher expected yield. The recent foreign funds outflow from India and the weakening of the rupee show that volatility in our financial markets depend very much on these actors.

The first article in this volume, therefore, attempts to develop a sentiment index for FII flows into India. The article highlights that factors driving FII investments include domestic, U.S. and emerging market (Brazil) variables. The article surprisingly finds no relationship between the overall growth indicator (GDP) and FII flows. The second piece looks into possibilities of raising capital from abroad from the trends in "bank capital" from balance of payments statistics and speculates on some futuristic trends. The third article is on Indian bond market and the author shows how liquidity infusion by RBI helps banking system to invest in bonds thereby increasing

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We had identified about 100 independent variables and considered their individual correlations with dependent variable, the Gross FII participation (Called FII_GROSS from now on) . The ones with very low correlation were excluded from further analysis. E.g.,

3month – 10 year interest rate term structure for India (-2%)

Chinese Yen/USD exchange rate (0%)

Since the dependent variable was a time series, it was natural to consider it as a sum of trend, seasonality and cyclical components. The trend part was estimated by 3 month moving average. We looked at 2 month, 3 month and 4 month moving average of FII_GROSS for estimating the trend portion, but the 3 month average seemed to fit the data best. Also introduced seasonality variables but they turned out insignificant in this analysis. Time of the year did not seem to influence the FII activity. The relevant variables (out of 100 variables analysed) discussed above were used to estimate the cyclical component of the series.

The Model

After trying out various combinations we decided to stick to a model which is dependent on at least 5-6 variables and whose results hold in out of sample validation period. We also checked for the possible multicollinearity problems with Variance Inflation Factors (VIF) and the autocorrelation with Darbin-Watson (DW) Statistic. We next present our model output and associated results for out of sample validation.

Table 2: ANOVA Table and Regression output for chosen model

Results are reasonable in the sense that the model appears to be a good fit given higher R-squared value. The significant variables are- Trend, Brazil ETF returns, trading days in a month and market volatility. The significance of Brazil ETF returns is quite interesting as U.S investors view Brazil as another destination for emerging market investment purposes. The negative association between market volatility and FII flows is logical as these investments are in the cash segment of the market. There is no
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Figure 1: Comparison of Actual FII flow and computed Index from August 2011

The correlation between the predicted index values and the actual FII flows has been quite satisfactory (see the diagram). The sentiment index provides a month-ahead sentiment. The index will be observed for next one year and if it is found that the index tracks the actual FII flows fairly well, we may call the constructed index a barometer of FII 17(I)18(17(I))0I gTJETBn.J475(om) a r att.1 335.45 T******h

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The fact that in the days to come bank capital needs to be significantly augmented is quite well-known. The pressure for increasing bank capital comes in the aftermath of the global financial crisis and emanates both from natural erosion of capital (arising out of holding of toxic assets by the banks) as well as newer regulatory regime. For example, under Basel III, capital requirement of banks is going to be significantly higher, *albeit* through a progressively gradual process. Indian banks cannot be exception to this general rule. The Economic Survey for 2012-13 of the Government of India noted, "though Indian banks remained well-capitalized, concerns regarding growing nonperforming assets (NPAs) persisted".

Such capital for the public sector banks can be raised from domestic and foreign sources. Admittedly, domestic sources for such bank capital could be from the government and private sources. However, there has been some tendency among Indian banks to source capital from abroad as well. In fact, "following the uncertainties prevailing in the domestic market and relatively subdued performance of the equity market during the first half of 2011-12, banks abstained from raising resources through public issues during 2011-12" (Economic Survey, 2012-13). Besides, during 2011-12, banks' resource

subordinated debt and investment reserve account.[1] Illustratively, under hybrid debt instruments items such as perpetual cumulative preference shares, redeemable non-cumulative preference shares, redeemable cumulative preference shares are all eligible as part of Upper Tier II Capital. Besides, subordinated debt in foreign currency can be raised by Indian banks subject to RBI approval.

Longer-term Trends

Recent Trends

So far Banks in India seem to be well-capitalized. Capital to Risk Weighted Assets of all types of commercial banks in India - public sector, private sector (both old and new), and foreign banks - are well above the statutory minimum rate of 9 percent (Chart 2).

Chart 2: Capital Positions of Banks in India

Source: Mohanty, Deepak (2013): "Perspectives on Banking in India", available at http://www.rbi.org.in

There are newspaper reports during that a number of banks are trying to tap global capital market to raise funds via bonds. Unconfirmed reports indicated that the Indian overseas Bank is planning to raise $500 million during the current financial year. The SBI too reportedly raised $1.25 billion through the issue of five-year overseas bonds. Similar amounts seemed to have been raised by the Exim Bank as well.

Interestingly, as per the latest BoP data (for the fourth quarter of 2012-13 as well as for the full year 2012-13), released on June 27, 2013, India's current account deficit (CAD) moderated sharply to 3.6 per cent of GDP in Q4 of 2012-13 from a historically high level of 6.7 per cent of GDP in Q3 of 2012-13. For the whole year 2012oricallR8437 T75.81 Tm[o1-10(23)-21(2l)-5(og)11( )-21(tw5(i)-4(r)-4(h o-21(2l)-22(o)-4(n c9(

During last few years, Government of India has been steadily increasing its market borrowing and funds almost 90% of its fiscal deficit through such market borrowings. In FY2011-12, large amount were raised by issuing T-bills of various durations. During FY2010-11 and FY2011-12, some Cash Management Bills[6] were also issued to raise funds from the system. As these large borrowings have put pressure in the market liquidity, RBI has to resort to Open Market Operations (OMO) on various occasions to infuse liquidity to the system. This liquidity infusion is in addition to the daily LAF Repo conducted by RBI to manage liquidity in the system.

FY	G-Sec		SDL		T-Bill	
	Gross	Net	Gross	Net	Gross	Net
2007-08	194050	146112	67779			

Table -2: Government Borrowing Details (` Crore[7])

power when striking a deal. These smaller entities depended heavily on the wisdom of brokers and other large traders. NDS-OM provided information of securities and the market activity on real time basis to all. Hence, trading securities becomes easier with people taking view on interest rate scenario rather than following their peers' activity in the market.

The new trading system, NDS-OM, provided higher liquidity to the system with an active order book management system and efficiency in price discovery. The traders could see the depth of the market anytime with buy and sell orders coming to the system with time stamp. Proprietary deals by Banks and Institutions accounted for about 87% in terms of value (90% in terms of number of deals). Participation in trading was also linked to a bank's total holding of Government securities. Typically a major part of a bank's holding of Government securities is in Held to Maturity (HTM) category as banks are allowed to put a part of the security (currently upto 25% of the Net Demand and Term Liabilities (NDTL) while Statutory Liquidity Ratio (SLR) has been brought down to 23% of NDTL[12]. Holding in the said category does not envisage any provision for mark-to-market losses as it is expected to be held till its redemption. The remaining part of the securities holding balance can be held in Available for Sale or Held for Trading which will require regular provisioning and mark-to-market.

Table – 3: Descriptive Statistics of Indian Government Bond Market								
	Volume Amount in ` crores				3 Months Yield (%)		10 Year Yield (%)	
Year	No of trades	Volume	Avg. Trades	Avg. Volume	Average	Minimum		Spread % (10Y – 3M)

5. Increase in Export Credit Refinance	25,512
6. Special Refinance Facility for SCBs (Non-RRB)	38,500
7. Refinance Facility for SIDBI/NHB/EXIM Bank	16,000
8. Liquidity Facility for NBFCs through SPV	25,000
Total (1 to 8)	4,91,628
Memo:	
Statutory Liquidity Ratio (SLR) Reduction	40,000

Source: RBI

The liquidity infusion also helps banking system to invest in bonds thereby increasing the bond turnover in the market. Since mid-2010, Indian market is going through a tight liquidity condition for which RBI has been injecting liquidity through LAF repo window and occasional OMO. The proactive policy initiatives were taken by RBI to avoid contraction of the RBI balance sheet and the same aimed at ensuring non-inflationary growth of money supply in the economy to support the needs of the real economy. This resulted in stabilizing the bond market turnover.

Table 6: Average LAF Support as a percentage of NDTL[15]									
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013
LAF	0.92%	0.90%	0.10%	-0.11%	2.23%	-0.13%	-1.12%	-1.44%	-1.49%
TR[16]	0.53	0.63	0.70	1.05	1.22	0.97	0.84	1.30	2.34

Source: CCIL, RBI

Trading Activity
Though there are large number of securities (there are 110 securities including special securities but excluding floating rate bonds as on March'13) extending maturity upto 30 years issued by the Government and available for trading in the market, trading is concentrated on a few securities. Indian Government bond market faces high concentration in benchmark securities like 10-year and 5-year maturities. Though there are large number of securities issued by the Government, trading in 10 securities constitute about 95% of the trading in terms of value. Hence most of the securities are relatively illiquid. Trading level in the market is also sensitive to the net LAF level. The correlation between Net LAF (as a percentage to NDTL) and average Trading volume is -0.33[17]. There is liquidity concentration in few securities like 10-year benchmark. The concentration of liquidity in few securities has increased in recent years.

Table -7: Liquidity Concentration (in %)

Trading concentration in benchmark securities has been hallmark of the Indian Government securities market. After the financial crisis, market interest in long term bonds have come down significantly.

Table – 8: Maturity Bucket Trading Distribution												
Category	M2003	M2004	M2005	M2006	M2007	M2008	M2009	M2010	M2011	M2012	M2013	Current
upto 5 Years	7.08	9.07	23.64	26.44	27.68	22.81	19.46	27.15				

Table – 13: Parameter Estimates IC					
Variable	**DF**	**Estimate**	**Standard Error**	**t Value**	**Approx Pr > |t|**
Intercept	1	-0.2114	0.6515	-0.32	0.7465
DY	1	2.4154	2.2522		