

# A Newsletter of **Finance Lab**

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# a₹tha



Indian Institute of Management Calcutta

## Editorial

### Chief Editor



**Prof. Ashok Banerjee**

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**Prof. Partha Ray**



**Dr. Golaka C. Nath**

The Financial Research and Trading Laboratory (Finance Lab) at IIM Calcutta was set up in November 2008. The vision of the Finance Lab is to design and build a state-of-the-art lab structure with real time market information to support financial research and to help educate business students for the financial environment of the 21st century. One of the major objectives of the Finance Lab is to develop and spearhead financial research culture in India leading to scholastic output as well as policy papers on Indian financial markets. The Finance Lab has initiated several steps in this direction- it is the pioneer in organizing India Finance Conference (under the joint banner of IIMC-IIMB-IIMA) every year, it holds Finance Lecture Series periodically, it organizes financial research workshop once in two years. The Finance Lab subscribes to national and international database and has developed a data center which archives high frequency data of Indian equity and commodity markets.

The Finance Lab is pleased to launch a monthly electronic newsletter – *aṛṥtha*. The aim of this newsletter is to bring out popular articles on key areas of financial markets which may be of interest to policy makers and practitioners. The newsletter is not supposed to give a market survey of trends of the past month. Rather it would contain articles which are thought provoking and also have policy implications. The newsletter will be released on the first working day of every month. Presently it has three sections-Equity Market, Bank Market and Debt Market. Each section will have one article.

The first piece explores how publicly available news can be exploited to secure abnormal returns in Indian equity markets. The article describes a news analytics algorithm that converts a story into sentiment score and goes on to show the relationship between sentiment scores and stock returns. The second article looks at credit risk exposure of Indian bank and the author warns that Indian banks may be heading for bad old days. Using CDS spread the article shows widening of spreads in recent times which are closer to 2008 era. The third piece looks at Indian debt market, its liquidity and depth. The article analyses major bond issuances in India in the recent past and highlights steps that are required to be taken to address the illiquidity of the Indian debt market.

I hope you'll enjoy reading the newsletter. Please offer suggestions for further improvement to [ashok@iimcal.ac.in](mailto:ashok@iimcal.ac.in)

Editor

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## Exploiting News for Profit

**Prof. Ashok Banerjee**



**Ashok Banerjee, Ph.D., is Professor, Finance and Control, Indian Institute of Management Calcutta (IIM-C). He is also the faculty in-charge of the Financial Research and Trading Lab at IIM-C. His primary research interests are in areas of Financial Time Series, News Analytics and Mergers & Acquisitions.**

News has always been a key source of investor information. There is a growing body of literature that argues that media influence investor sentiment, hence asset prices, and asset volatility. Studies have used word counting method in order to find correlation between corporate action and share price. One study, for example, has scanned several corporate annual reports to find out the association between the number of times the word ‘risk’ is used in the annual reports and the share price shock. People have also used linguistic tone of quarterly earnings conference call to examine the relationship between conference call tone and the contemporaneous stock price reaction. Such research using news data, called news analytics, has become more popular with the availability of electronic news and news sentiment scores provided by select vendors. News analytics, in general, measure the relevance, sentiment, novelty, and volume of news. We have observed that news carrying strong sentiment move the asset prices.

The sources of news can be classified into– paper/electronic news, pre-news (news from primary sources), and social media. Smart vendors/ticker services (e.g., Thomson Reuters, Bloomberg, and Raven Pack) are using sophisticated news classifier to understand the sentiment of electronic news and thus have developed “quantextual” investment and trading strategies. However, there is always a danger in using information in the social media and message boards due to presence of high “noise”.

### **News Analytics Algorithm**

The Financial Research and Trading Laboratory (the Finance Lab) of IIM Calcutta have developed proprietary algorithm to extract electronic news and convert such news into scores on real time basis (Box 1). These scores can be used to develop simple trading strategies for profit. Our results have shown presence of abnormal returns in intraday trading. One can exploit our scores to realize abnormal profits with minimum investment. Our study has observed that such profit exists for a very short period spanning over a few minutes. However, even after controlling for transaction costs one can surely make profits with our scores.

Our algorithm tracks only company-specific financial news from a single source- Thomson Reuters. However, the same algorithm can be suitably modified to scan news from other reliable sources. Our experience shows that it is always better to gather news from one source for consistency and ease. Our news data have almost all the features as trade data- time stamp, volume, scores. Hence, one can plug in news scores in the trading terminal as an extra field alongside trade data. While integrating the news feed online, we collected the metadata from the html page source so that all the news articles are classified based on date and time automatically.

This metadata can be used to sort the news articles in the manner the user wants and get the required score.

The advantage of using only financial news is the realization that financial reporters have limited vocabulary to express sentiments and this knowledge has helped us develop our dictionary for text mining. The dictionary was trained with a list of verbs used by financial reporters signifying positive and negative sentiments. Verbs representing similar meaning are replaced by a single synonym. This has helped us in estimating repetition of a verb to capture its frequency of occurrence. For example, verbs like “rise”, “grow”, “soar” may be replaced with a synonym “rise”. The sentiment scores obtained from our proprietary analytics is compared with the sentiment observed by ‘news readers’ to test the robustness of the algorithm. Our analysts have initially read a good number of news stories and classified them in three groups- positive, negative and neutral. The scores obtained from the news analytics software were compared with the classifications done by ‘human’ readers to ensure minimum misclassification.

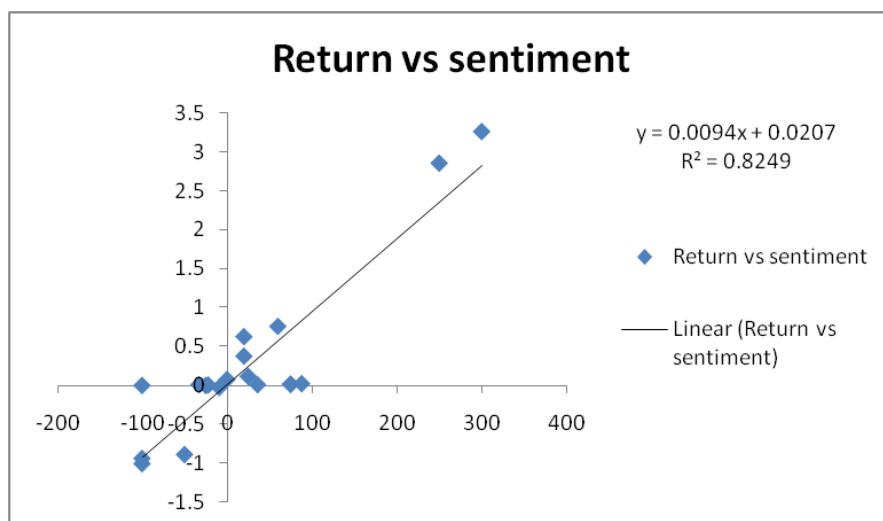
### ***Box 1: News Score Methodology:***

At the outset the entire text is converted into a single continuous sentence by removing the punctuations. Thereafter all the adjectives and adverbs are removed in order to retain only nouns and verbs in the text. The position of each noun and verb in the text is not changed while removing other words. The following scores are calculated:

1. **Relevance Score:** This score highlights how relevant is a news item in relation to a company. It is observed that the essence of any news item is captured in the headline and the first paragraph. Thus, if the name of a particular company appears in the headline, the news item “belongs” to the captioned company. We have used a relevance score of 100 (the maximum) if the name of a company appears in the headline as well as in the first paragraph. On the other hand, if the name of the company appears in the first and subsequent paragraphs (and not in the headline), the score assigned is 90. The relevance score reduces as the name of a company appears, for the first time in the news item, in the second and subsequent paragraphs. Thus, in a particular news item, more than one company’s name may be mentioned; but the relevance of the story for each company is estimated using the algorithm as above.
2. **Certainty Score:** This score highlights how certain is the association of a verb with a noun. For example, consider a news item, ‘Yen soars and Sony’s profit dips’. There are two nouns- Sony and Yen and two verbs- soars and dips. The news analytics tool should be able to correctly associate the verbs with relevant nouns. In this case, if the algorithm wrongly associates ‘soars’ with Sony and ‘dips’ with Yen, one would get a completely wrong sentiment. The certainty score captures noun-verb pairs and their association. A high certainty score indicates the confidence with which a verb is associated with a noun.
3. **Frequency:** This score refers to the number of times a particular verb has appeared against a noun. Higher the frequency of a verb (with respect to a noun) stronger is the sentiment. Since our algorithm replaces verbs with similar meaning with a single synonym; the frequency of occurrence of a verb implies the strength of the verb in the news.
4. **Sentiment Score:** This is the most important score. This score classifies a story into positive, negative and neutral sentiment. The noun-verb pair is assigned a score based on their proximity. If a noun is immediately preceded or succeeded by a verb, the score would be highest. As the distance between the noun and the verb widens, the score falls. Negative verbs (e.g., fall, plummeted etc.) are given negative scores and positive verbs positive scores. Thus, a score near zero indicates neutral sentiment.

## Sentiment Score and Returns

It is generally observed that news sentiment scores explain the stock price behavior well. We have scanned news on several Indian companies whose stocks are traded on National Stock Exchange and observed that one can profitably exploit the news sentiment over a shorter period. However, one cannot use news-based trading strategy to make money in the long-run. This empirical evidence confirms that news-based trading strategies can be developed to take advantage of short-term market imperfections. Markets are by and large efficient in the long run. One needs to use fundamental and other technical parameters to identify investment strategy in the long run.



Source: S. Aravind and Vibin Prabhakaran (PGDCM 2012) Major Research Project on News Analytics. Data support by the Finance Lab, IIM Calcutta

We have used, in this analysis, only news with relevance score of 90. Results (Table 1) shows that stock prices react to news shocks as predicted. It is observed that market reacts to both off-market news and market-hour news.

**Table 1: Raw Returns**

Company	Time Stamp	Relevance	Sentiment	Returns	Run time
Reliance Infra	Tue Feb 14, 2012 18:39:36	90	250	2.85%	15 minutes
Ranbaxy	Wed Dec 21, 2011 14:26:00	90	300	3.26%	15 minutes
Reliance Industries	Thu Feb 16, 2012 10:50:55	90	-100	-0.73%	18 minutes
Infosys	Thu Jan 12, 2012 12:16:27	90	-100	-1.01%	1 hour 25 minutes
TCS	Tue Jan 17, 2012 14:47:04	90	88	1.58%	90 minutes
SesaGoa	Thu Feb 23, 2012 12:33:53	90	60	0.75%	27 minutes

Source: S. Aravind and Vibin Prabhakaran (PGDCM 2012) Major Research Project on News Analytics. Data support by the Finance Lab, IIM Calcutta

The stock returns are regressed against news sentiment scores. The positive coefficient of the sentiment score (which is also statistically significant) shows that stock returns reacted positively to positive news sentiments. The model also has high explanatory power.

One might argue that the raw returns do not specifically suggest whether news-based trading can generate alpha (excess return). Our research has shown that news-based algorithm can help you develop alpha-generating strategies. On a different set of companies and different time period, our proprietary algorithm is used to evaluate whether one can generate alpha using news-based trading strategy. The results (Table 3) are quite encouraging.

Table 2: Market Cap and Traded Volume

Company	Market Cap	Traded Volume
Bharti	11584365	82.04
Cipla	2541647	22.13
HCL	3302334	26.78
Heromotocorp	4292083	7.82
Reliance Comm	1310657	198.98
Sun Pharma	6548143	12.26
Sesa Goa	1665633	40.37

*News scores are obtained for companies with varied liquidity to test whether the stock price behaviour of liquid and news sentiments explain illiquid stocks*

Market cap is in millions of ₹ and traded volume is in millions of shares in June 2012 in NSE. Data support by Ms. Priyanka Dasgupta, Assistant Manager, Finance Lab

Run time (table 3) indicates the time since the publication of the news till trend reversal. Market returns are estimated from NIFTY values during the runtime. Returns are not annualized. Results show that news-based trading strategy can outperform the market both during good days and bad days.

Table 3: Excess Returns

Company	News Time stamp	Relevance	Sentiment	Run time	stock-ret	Market-ret	Excess return
Bharti	July 3 10.19 AM	90	-66	12 minutes	-0.63%	-0.16%	<b>-0.47%</b>
Cipla	May 3 12:27 PM	90	42	16 minutes	0.95%	0.36%	<b>0.59%</b>
Cipla	May4 4:45 AM and 5:02 AM	90	100	29 minutes	3.32%	-0.17%	<b>3.49%</b>
Heromotocorp	June 4 10:56 AM	90	50	3 Mins	0.24%	0.11%	<b>0.13%</b>
Heromotocorp	June 4 11:30 AM	90	28	3 Mins	0.11%	0.00%	<b>0.11%</b>
RELIANCE COMM	July 9 3:32 AM	90	-50	6 minutes	-1.60%	-0.03%	<b>-1.57%</b>
Sun Pharma	July 3 6:21 AM	90	100	15 minutes	0.80%	0.15%	<b>0.65%</b>
Sesa Goa	Jun 02 13:30 PM(Sat)	90	-66	Overnight	-1.93%	-0.91%	<b>-1.02%</b>

Computational support by Mr. Souma Mazumdar, System & Quantitative Analyst, Finance Lab

We have investigated the impact of publicly available news on stock returns using high frequency return data and news scores. It is evident that relevant and value-bearing news do impact stock returns. High frequency traders would take time in assimilating the sentiments inherent in news and may, therefore, miss the opportunity to book abnormal returns. High-frequency news sentiment scores would help traders take instantaneous trade decisions without reading the full news. One may like to augment the sentiments in public news with social media news. Let us keep it for future.

## Banks' Credit Default Swaps in India: Are they signaling the bad old days?

Prof. Partha Ray



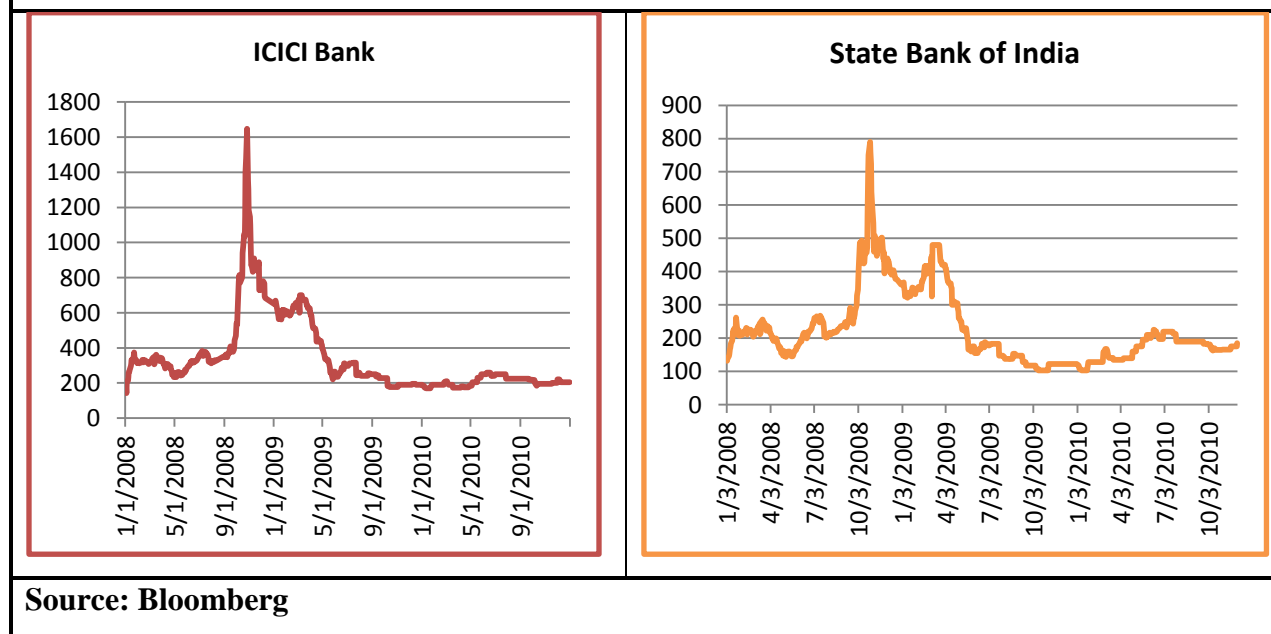
**Partha Ray, Ph.D., is Professor, Economics, Indian Institute of Management Calcutta (IIM-C). Prior to joining IIM-C, Prof. Ray, a career central banker, was the adviser to Executive Director, International Monetary Fund, Washington D.C. during 2007-2011.**

Credit Default Swaps (CDS) (equivalently as “CDS spread”) “is a bilateral, off-balance sheet agreement between two counterparties in which one party offers the other party protection against a credit event” (like default) in return for a premium payment.<sup>1</sup> Thus, an increase in CDS spread of any entity (like corporate, Sovereign or bank) is indicative of its receding credit worthiness. Of late the CDS spreads of Indian commercial banks are showing some signs of nervousness. Are these in anyway fore-runner of some bad news in the days to come?

### Banks' CDS spreads during the heyday of the Financial Crisis

To seek an answer to the question posed above, it may be useful to go back little in the past. During the hey-day of the global financial crisis and in particular after the fall of Lehman Brothers, CDS spreads of a number of Indian banks shot up to stratospheric levels. The cases of the State Bank of India (SBI) and the ICICI Bank are interesting in particular (Chart 1). This was, of course, in consonance with the global trends prevailing at that time.

**Chart 1: CDS Spreads of Two leading Indian Banks during 2008 - 2010**



<sup>1</sup> Chaplin, Geoff (2010): *Credit Derivatives: Trading, Investing and Risk Management*, Sussex: Wiley.

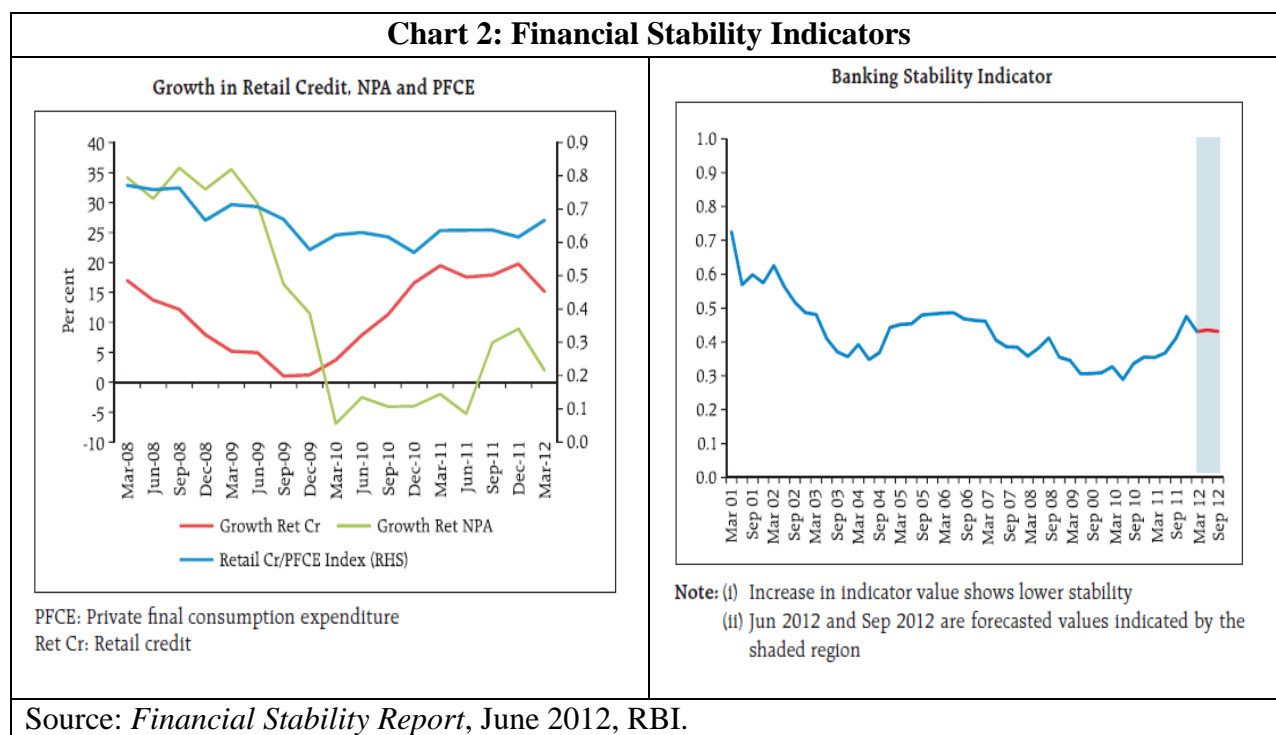


Interestingly, the CDS spreads of these banks shot up despite the small or non-existent exposure of Indian banks to the sub-prime toxic assets, originated in the U.S mortgage market.<sup>2</sup> These were more a reflection of the generalized rise in counter-party risk cross the globe and consequent clogging of normal credit mechanism. Admittedly, the general higher level of CDS of the ICICI Bank vis-à-vis the SBI is to do with the government ownership of the SBI and the assurance of the implicit government guarantee.

## Recent Trends

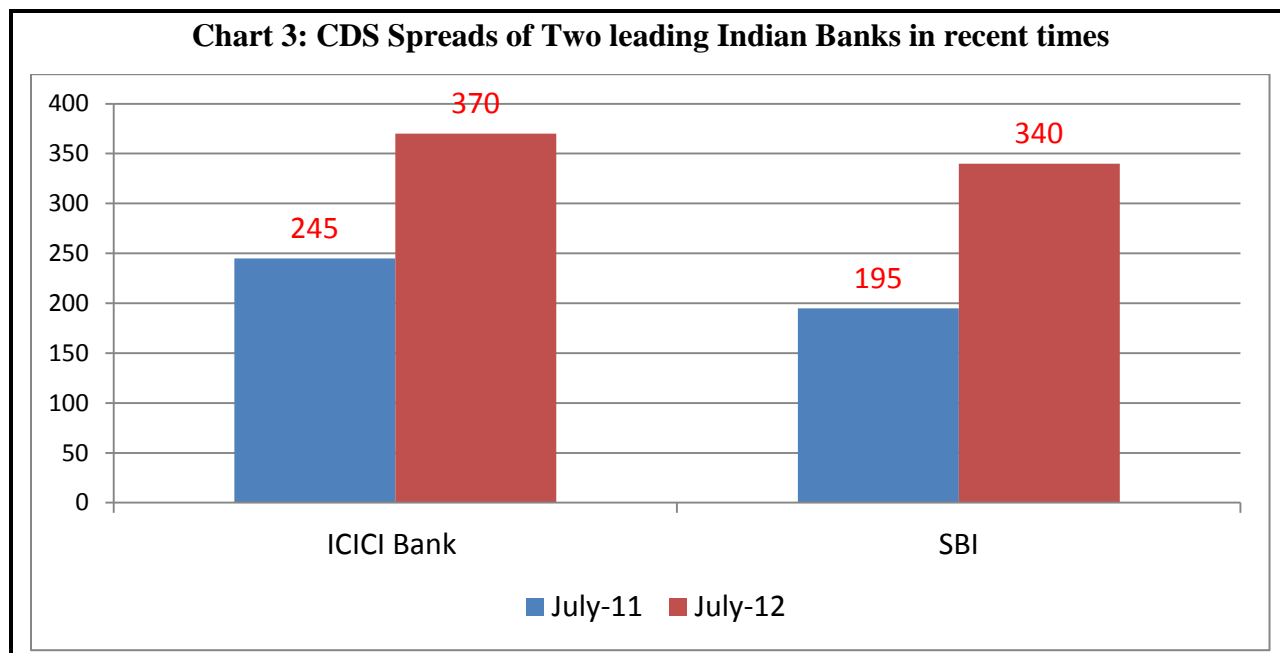
In recent times, the Credit rating agency, Moody's downgraded the SBI to from C (-) to D (+) on October 4, 2011. As per Moody's, a D rating suggests "modest intrinsic financial strength, potentially requiring some outside support at times," while a C rating is indicative of "adequate intrinsic financial strength." The standalone rating for SBI's private sector competitor banks, such as ICICI Bank, HDFC Bank and Axis Bank, already stands at C(-). This downgrading of the SBI is on account of "SBI's capital situation and deteriorating asset quality". How far can such a phenomenon of deteriorating asset quality be observed across the board?

The recently published *Financial Stability Report* of the Reserve Bank of India (RBI) noted that concerns over deteriorating asset quality being cushioned off by comfortable capital position. In fact, the forecast for the banking stability indicator generated by the RBI show a *status quo* during the half year April – September 2012 on top of a deteriorated trend over the last six months (Chart 2).



<sup>2</sup> As per newspaper reports, the ICICI Bank incurred around \$264 million mark-to-market losses on account of its exposure to credit derivatives as well as an erosion in value of investments made by its subsidiaries in the UK and Canada. SBI's mark-to-market losses are around Rs1 crore (see, Gargi Banerjee, "Indian banks' CDS spreads widening", *The Mint*, March 13, 2008 available at <http://www.livemint.com/2008/03/13001410/Indian-banks8217-CDS-spread.html>).

In such a situation how does the future look like? On a point-to-point basis, over the last one year (i.e., July 2012 over July 2011), the CDS spreads of both the banks have gone up substantially (Chart 3). There are reasons to believe that apart from mildly deteriorating asset quality and global uncertainty, domestic macroeconomic situation could have played a responsible role behind such a phenomenon.



What does it mean for the banking sector and the economy? In any such situation, banks will need capital to tide over any eventual stress. So far, Indian banks at an aggregative level are well-capitalized with capital to Risk weighted Assets Ratio (CRAR) of the banking system at 14.1 per cent as at end March 2012. Notwithstanding such aggregate CRAR, three implications for the Indian banking may be noted. *First*, there are elements of divergence across the banks in the distribution of CRAR; e.g., while the CRAR of the new private banks exceeds 16 per cent, that of the public sector banks is slightly less than 14 per cent. *Second*, it may be noted that the growth of NPAs at 43.9 per cent as at end March 2012 far outpaced credit growth of 16.3 per cent. *Third*, in the flip side, of course, there are reports that CDS spreads for Bank of China and China Development Bank have also surged recently and that they are rising at much faster rates than the rest of Asia excluding Japan.<sup>3</sup>

But against a perception of weak domestic economy along with heightened global uncertainty, it could be difficult to acquire capital for low credit-worthy banks. As of now it is too early to comment whether the bad old days could reappear but we are being unduly alarmist. No matter how the future looks like, there are early warnings of concerns. To use a cliché, there are reasons to be cautiously pessimistic.

<sup>3</sup>“CDS signaling trouble for Chinese banks”, available at <http://www.macrobusiness.com.au/2011/09/cds-signaling-trouble-for-chinese-banks/>

## Indian Corporate Bonds Market – Need of the Hour\*

**Dr. Golaka C. Nath**



**Dr. Golaka C Nath is a Senior Vice President at the Clearing Corporation of India Ltd. (CCIL). He has over 21 years of experience in the banking and financial sector, having previously worked with the National Stock Exchange of India Ltd. and Vijaya Bank. In the past, he has worked on a World Bank Project on “Developing Bond Market in South Asia”. He has also provided secretarial service to the High Powered Committee on “Corporate Bonds and Securitization” appointed by the Ministry of Finance, Government of India.**

In recent times, debt market is increasingly attracting the attention of researcher, market participants and policy makers around the World, thanks to the sovereign debt crisis in Euro zone. Global bond market stood at about US\$95trillion as of 2010 out of which 70% accounted for domestic bonds. The US is the largest market with 38% of the value outstanding, followed by Japan 20%. Government bonds accounted for 57% of the outstanding value of domestic bonds in 2010 while bonds issued by Corporates account for about 43% of the value. The Euro bond market has suffered in recent times as “flight to quality” has taken the center stage. Bad news from Euro zone also has led to poor performance for higher-risk areas of the market, such as high-yield bonds and emerging markets debt. The “flight to quality” reaction by bond investors have led to huge investment in US Treasuries thereby moving the yield on the 10-year note to record lows.

Indian debt market is unique in a sense that the concentration of sovereign bonds outweighs the corporate bonds. Discussion on Indian corporate bond market has been going on for ages and in each and every forum, the need for developing the corporate bond market as an alternative funding arrangement is well understood and acknowledged. Both Government and Securities Exchange Board of India (SEBI) have set up many Groups, Committees, and Forums to study and discuss the issue for finding out a workable solution. The Dr. R H Patil Committee report (2005) presented a reasonable solution and roadmap for kick-starting this form of the market to fulfill the future need of the Industry in funding investment. Almost 7 years have passed after the report was accepted by the Government, not much headway has been achieved. Some of the issues like unification of stamp duties on creating charges for securitized debt have remained a contentious issues and no solution has been found to take this market to the place where it belongs. Unlike other countries, a large chunk of corporate funding In India is done through bank lending, retained earnings and capital through equity offerings. Corporate bonds contribute fairly little in terms of long term funding. Government allowed tax benefits (Budget, 2010) on infra investment upto a limit for tax payers. Key motivation for investing in debt market for retail investors is tax saving for tax payers.

\* *Personal views of the author only and not the views of his organization*

Given the Indian legal system's unusual delay in giving appropriate relief to enforce the contract of debt with regard to payment of periodic interest, enforcing collaterals against the debt, bankruptcy, etc. poses serious challenges to attract right kind of investors in the corporate debt market. Corporate Debt Restructuring (CDR) scheme introduced by RBI to bypass the unusual legal delays in judicial system has not been very successful. The insolvency regime is spread over several pieces of legislation and among different course and regulatory bodies and this poses serious challenges and does not sound to be cost effective. Given the regulatory framework at present, serious structural changes and suitable legal reforms are needed to provide a strong legal basis to the Indian debt market. Creating better market infrastructure like technology platforms, clearing corporations, etc. are going to help to some extent but legal framework will address issues from a long term prospective and help creating a robust market place.

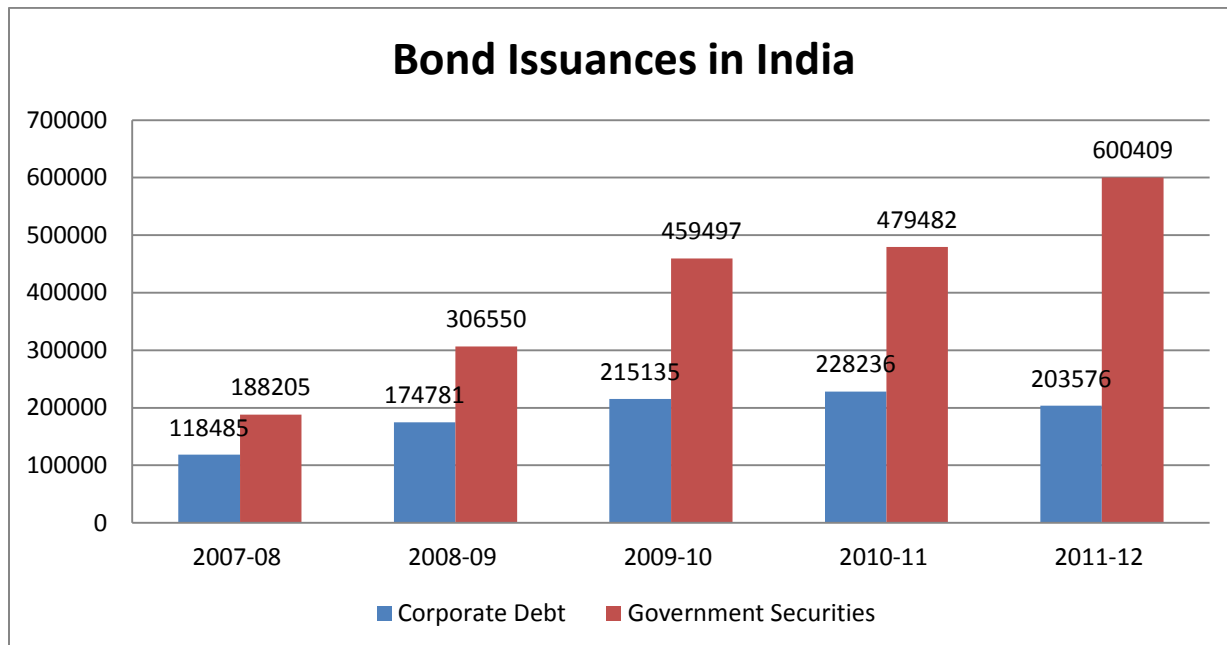
### **Market Liquidity and Depth**

Current estimated size of the Corporate debt market in terms of outstanding issuance is about `9.0lakh crores while Government issuance outstanding is about `31.0lakh crores. The corporate bond market has been wary of the large government borrowing program crowding out the corporate bond market and a new SEBI law on rollover of limits limiting FII participation. The government has set the cumulative debt investment limit in corporate bonds (including Infra Bonds) for FIIs at US\$45 billion and at US\$15 billion in government securities. However, there are certain changes to the FII investment rules with regard to limits reuse and this may affect the participation of FIIs in the market.

Most of the issuers of the corporate bonds are typically Public Sector Units – predominantly owned and controlled by Government. These entities find it easier to sell their bonds as they are also perceived as sovereign entities with tacit and perceived guarantee on such borrowings. This provides an immense comfort to the investors with respect to possible bankruptcy that may require higher provisioning. Investing in these entities is a workaround to avoid legal impediments. Major bonds issuances in India are done through private placement route. The private placement route requires little disclosures as the market is confined to qualified institutional investors and cheaper vis-à-vis public issuances. The private placement document is generally a brief document that gives brief details of the issue and the company issuing the bond. The issuers prefer this route as it is far cheaper in terms of cost vis-à-vis public issue. Unlike a prospectus for public issuances, private placement does not require any statutory disclosure. Since bonds are privately placed with institutional investors, the secondary market liquidity is limited as most of the investors generally hold the bonds till maturity as they have already assumed the risk and the bonds are held in the mark to market category of investment (Held for Trading).

During 2011-12, 252 companies raised funds through 2363 bond issuances. The issuance statistics shows that most of the issuances are up to 3 years of maturity (61%). With regard to the rating structure of the issues, the investment grade securities were dominant in the market and higher grade A-class securities (A, AA and AAA) accounted for 84% of the number of

issuances. The issuers do not prefer issuing lower grade securities as the market does not have appetite to absorb these securities. The moot point is the efficient valuation of the lower grade securities in the market.



The absence of varied class of instruments also does not augur well for the market. Bonds with floating rate coupons linked to benchmark rates, embedded options, convertibility clauses, etc. are not very popular in the market. Bank bonds are most preferred by investors as they are considered almost lie sovereign securities as the incidence of bank failures are very rare in India. Hence Bank bonds demand premia for investment. Trading in corporate bonds concentrated in AAA rated bonds which accounts for 89% (81% of deals – multiple deals in same bond) and 99% of the total deals were in the first 3 A group rated securities (A, AA and AAA). Issuers and investors concentrate only on high rated securities and hence market almost non-existent for lower rated bonds in India.

### **Need of the Day**

The illiquidity in the corporate bond market emanates from many sides – regulatory issues, lack of effective and easy to implement bankruptcy legislation, higher level of Government borrowings putting pressure on rates for corporates, continuing shortage of liquidity in the system resulting in higher cost, etc. The corporate bond market – both primary and secondary – is heavily skewed due to high reliance on higher rated bonds like A, AA and AAA category. The issue is if the lower rated borrowers can access market by paying suitable risk premia. Given the market structure today, it is very unlikely that lower rated issuers can easily access market by issuance of the bonds. Lower rated corporates typically access funding from banking sector. An microstructure need to be in place to encourage these entities to access bond market for funding by paying required risk premia. However, this will require broadening the investor base by bringing in investors having higher risk appetite. Foreign institutional investor base need to be enhanced suitably to attract right kind of investor to the market with varies risk appetite.