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Editorial

This issue comes at a time when the Nobel Prize for Economics 2013 is already announced. This issue contains an article each on Eugene Fama and Robert Shiller - two of the three winners' of 2013 Economics Nobel. The article on Fama showcases the prolific writer and his untiring contribution in explaining the behaviour of asset returns and the financial market as a whole. Fama maintains that it is futile to predict stock prices in the short run. The article on Robert Shiller highlights his thesis on irrational exuberance which demonstrated ample evidence that there could be speculative volatility in a free society and that the faith on efficiency on rational markets could be somewhat misplaced.

This issue introduces a new section on corporate governance with a piece on audit switching. The author revisits various arguments offered in the literature for auditor switching and ask if they can be valid in the Indian context. He also presents summary data on the evidence of auditor switching in India. The piece on repo market shows that traders use the repo market in India more for liquidity management and less for managing portfolio of securities.

I hope you'll enjoy reading the newsletter. Please offer suggestions for further improvement to ashok@iimcal.ac.in

Happy reading!

Ashok Banerjee

Famous “Gene” Fama and the World of Finance

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

The University of Chicago Booth School of Business organized a simple function to felicitate Gene Fama and Lars Peter Hansen (one of the other two recipients of the same award) immediately after the Nobel Prize for Economics 2013 was announced. Fama was asked about his reaction on hearing the announcement of the prize and he said that he had a class to take at the School in the morning of the same day and he went on to take the class. The theme of [the 2013 Sveriges Riksbank Prize in Economic Sciences](#) (the Nobel in Economics) was “Trendspotting in Asset Markets” and the Nobel committee pointed to Fama's ground-breaking work advancing the Efficient Market Hypothesis (EMH).

Fama: The Prolific Writer

Eugene Francis "Gene" Fama (Fama) obtained his PhD in 1964 at the age of twenty five from the Graduate School of Business, University of Chicago for his dissertation *The Behavior of Stock Market Prices*. Fama became a Professor in the same school at the University of Chicago in 1968- he had 11 publications by then. He still teaches at the University of Chicago Booth School of Business. He has published more than 100 papers (Table 1) in fifty years of his academic career, of which 35 papers are single authored papers.

Table 1: Journal-wise Publication Frequency

Journal Name	Frequency
Journal of Finance	22
Journal of Financial Economics	21

American Economic Review	12
Journal of Business	12
Journal of Monetary Economics	8
Journal of Political Economy	6
Financial Analysts Journal	5
Journal of the American Statistical Association	3
Review of Financial Studies	2
Management Science	2
Journal of Financial and Quantitative Analysis	2
Others	9
Total	104

Compiled by Sandeep Chakrabarty, Finance Lab, IIM Calcutta

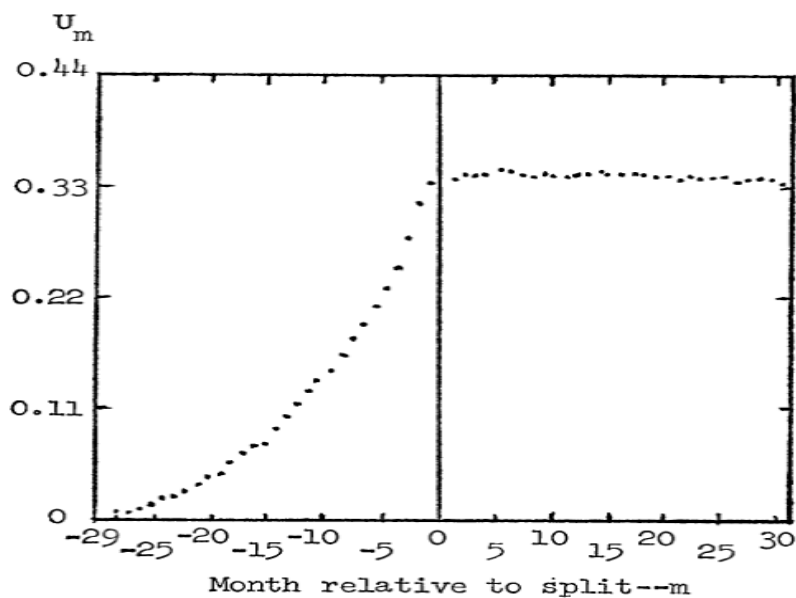
In December 2011, Fama wrote an invited paper titled *My Life in Finance* (Annual Review of Financial Economics) as a 'professional autobiography'. He mentions that he started his undergraduate studies in Tufts University in romance languages 'but after two years became bored with rehashing Voltaire and took an economics course'. He never changed his loyalty since then! His second publication (Journal of Business, 1965) was on behavior of stock market prices and his hundredth publication (Journal of Finance, 2010) was also to do with the stock market returns. He is married to his high school sweetheart Sallyann Dimeco and the dynamic subject Finance for more than fifty years! This professional autobiography is a must read for all serious researchers in finance.

Fama and EMH

Many articles are written on the contribution of Fama in the field of finance and the relevance of his EMH in modern times- the hedge fund industry believes that it is possible to make extraordinary profits over a smaller window. The trait lies in identifying the window. Fama, hailed as the father of

EMH, famously argued that it is impossible to beat the market with past information and any new information get quickly factored into the price (Figure 1). Using stock split as a new information, Fama showed that market factors the news almost instantaneously. Fama claims it is equally impossible to predict stock prices in the short-run. Market efficiency implies that trading rules, technical systems, market newsletters etc. have essentially no power beyond that of luck to forecast stock prices¹. Thus, chartists have no place in Fama's world of Finance. Later the behavioral finance literature established that investors do not act rationally and there are anomalies in the market which can be exploited by smart investors to generate excess returns. Skeptics blamed the EMH when market crashed in 2008 and cried that markets were never efficient. However, they must realise the lesson learnt during market crash is exactly what Fama was claiming- stock prices can never be predicted! All excessive asset prices are bound to burst. However, Fama later in mid-1970s wrote that one can predict stock returns at longer horizons using fundamental variables like corporate dividend. One can get better return by taking higher risks.

Figure 1 Cumulative Average Residuals on stock Splits²



Fama (along with Kenneth French) in the early 1990s explained the cross-sectional variations in the stock returns by a famous three-factor model³. This seminal work exposes the inadequacy of the

¹ http://faculty.chicagobooth.edu/john.cochrane/research/papers/Fama_panel_nov_2013.pdf

² Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, The Journal of Finance, Vol. 25, No. 2, May 1970, 383-417

³ Fama, Eugene F.; French, Kenneth R. (1992). *The Cross-Section of Expected Stock Returns*. Journal of Finance 47 (2): 427-465

Capital Asset Pricing Model (CAPM) in explaining cross-sectional variations in the asset returns and has been the most cited paper in finance.

Fama and High Frequency Finance

The high frequency trading community is out to exploit Fama's hypothesis that any new material information will influence the stock price and the price adjustment will happen 'quickly'. Hence, if one can trade on the new information faster than the others, there is an opportunity of earning excess returns. But how 'quick' is really 'quick'. Today's stock market has become a world of automated transactions executed at lightning speed. About 60 percent of U.S. equities trading volume now come from firms using high-frequency strategies. In electronic trading, speed is measured by latency—the time it takes from when a trade is started to when it is executed. The farther a signal has to travel, the higher the latency, which is why traders are paying through the roof to collocate their trading systems with the stock exchange. For example, Project Express in Canada⁴ completed in 2013 the fastest cable across the Atlantic, reducing the time it takes data to travel round-trip between New York and London to 59.6 milliseconds from the current top speed of 64.8 milliseconds. Those five milliseconds advantage could be a huge plus for electronic trading firms who have access to the high speed cable. Traders now fight for such millisecond head start and are willing to pay millions. Trading is now essentially a virtual art, and its practitioners put such a premium on speed that NASDAQ has considered issuing equal 100-foot lengths of cable to the brokers who send orders to its exchange servers⁵. In September 2013 the Washington Post carried a story⁶ that there was strong circumstantial evidence that one or more traders received an early leak of the Federal Reserve's surprise decision not to slow down its bond purchases. In fact, it is alleged that three to seven milliseconds before the fed moved interest rates, billions of dollars of trades were input that took advantage of the changed rates, reaping huge profits. The allegation of insider trading is being probed. In the pursuit of 'excess return' on the basis of 'millisecond information', high frequency traders trade too much. The volume of trading in stock markets across the globe has increased many folds with the advent of automated trading facilities. The excessive trading by institutional and individual investors, mostly during Bull Run, is explained by hypothesis-

⁴ <http://www.businessweek.com/articles/2012-03-29/trading-at-the-speed-of-light>

⁵ <http://www.technologyreview.com/featuredstory/416805/trading-shares-in-milliseconds/>

⁶ <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/09/24/traders-may-have-gotten-last-weeks-fed-news-7-milliseconds-early/>

overconfidence. Empirical evidence⁷ suggests that overconfidence plays a pivotal role in explaining individual investors' propensity to trade too much and too speculatively. The more overconfident an investor, the more (s)he trades and there is higher chance of lower returns. How to measure investors' overconfidence? In an interesting study, Brad M Barber and Terrance Odean⁸ looked at the psychology literature and reflected on their own anecdotal observations to conclude that men are more overconfident than women. They found that men traded 67% more actively than women and underperformed women investors by 1% per year.

One now finds computer science graduates populating the hedge fund industry and writing algorithms to exploit any anomalies in the market. News sentiment based trading is fast gaining popularity. Traders are now using real time news to generate sentiment signals and striking trade on the basis of news sentiment scores. One wonders whether there will be any latency left in the market and the high frequency finance will only prove Fama's assertion of unpredictability of high frequency returns.

Fama did not refute the role of high frequency traders and in one of the interviews had mentioned that high frequency traders are not to be blamed for stock market crash. He argued that these traders did not trade during the crash! However, recent studies have shown that excessive trading do not guarantee superior returns. Hence, huge investment in IT infrastructure to minimize the latency in trading may be difficult to justify. Fama's contribution to understanding low frequency stock market behaviour is significant and one hopes that he would keep writing more fascinating papers in the future. Only Fama can outperform his achievements!

⁷ W.-I. Chuang, and R. Susmel, *Who is the more overconfident trader? Individual vs. institutional investors*, Journal of Banking & Finance 35 (2011) 1626–1644

⁸ Brad M Barber, and Terrance Odean, *Boys will be Boys: Gender, Overconfidence and Common Stock Investment*, The Quarterly Journal of Economics, February 2001

Robert Shiller: A Sceptic and Conscience Keeper in the World of Finance

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.

As with any live subject, the discipline of Finance is not a flat monolithic and there are differing and competing schools of thought within it. In fact, Miller (2000) recognized the “tension” between the two mainstreams in finance scholarship: (a) the Business School (or “micro normative”) approach, which focuses on investors ‘attempts to maximize returns and corporate managers’ efforts to maximize shareholder value, while taking the prices of securities in the market as given; and (b) the Economics Department (or “macro normative”) approach, which assumes a “world of micro optimizers” and deduces from that assumption how the market prices actually evolve.⁹ Even in reference to such taxonomy of the mainstream finance, Professor Robert Shiller (Sterling Professor of Economics, Yale University) one of the recipients of this year’s Nobel Memorial prize in Economics, can perhaps be seen as an outsider. The Nobel committee described Professor Shiller as a founder of the field of behavioural finance and a pioneering analyst of speculative bubbles in the stock and real estate markets.

Early Writings

After his Ph.D. in economics from the Massachusetts Institute of Technology in 1972, Shiller’s initial publications centred around Bayesian econometrics and rational expectations; and included papers like, "A Distributed Lag Estimator Derived from Smoothness Priors," (*Econometrica*, 1973); or “Rational Expectations and the Term Structure of Interest Rates," (*Journal of Money, Credit and Banking*, 1973). In fact, his sojourn to the world of finance was perhaps his 1981 paper, entitled,

⁹ Merton H. Miller (2000): “The History of Finance: An Eyewitness Account”, *Journal of Applied Corporate Finance*, Volume 13, Issue 2, pages 8–14.

"The Use of Volatility Measures in Assessing Market Efficiency" (*Journal of Finance*), where another test of market efficiency was developed. In the same year, his paper titled, "Do Stock Prices Move Too Much to be justified by Subsequent Changes in Dividends?" was published in the *American Economic Review*. In these papers lay the seeds of his ideas on behavioral finance.

Justin Fox in his bestselling book, *The Myth of Rational Market* (Harper Collin, 2009), viewed Shiller as a rebel within the mainstream literature and compared Shiller's contribution of finance to that of Joseph Stiglitz's contribution to Economics. Fox went on say,

"While Joe Stiglitz led the way in looking for theoretical flaws in the perfect market world view, another product of Samuelson and Modigliani's MIT was to take on the efficient market hypothesis where it counted – in the data. Robert Shiller was a sophisticated statistician and a crack computer programmer. He combined those skills with a seemingly naïve eagerness to apply them to questions so simple that they could seem childlike, brazen or even downright lunkheaded" (p. 196)

This is best illustrated in Shiller's 1984 paper that he presented to the Brookings Institution. He categorically commented that relating rationality of stock market to the unpredictability of stock prices is, "one of the most remarkable errors in the history of economic thought".

Behavioral Finance

In general terms, behavioral finance moves away from the traditional assumptions of expected utility maximization, with rational investors in efficient markets. Broadly speaking, there are two major building blocks of behavioral finance: (a) cognitive psychology (how people think); and (b) the limits to arbitrage (when markets will be inefficient) (Ritter, 2003).¹⁰ Shiller's contribution to behavioral finance sprang from his dissatisfaction of the predictive power of efficient market hypothesis regarding excess volatility in the stock market; he has commented candidly:

"From my perspective, the 1980s were a time of important academic discussion of the consistency of the efficient markets model for the aggregate stock market with econometric evidence about the time series properties of prices, dividends and earnings. Of particular

¹⁰ Ritter, Jay R. (2003): "Behavioral Finance", *Pacific-Basin Finance Journal* Vol. 11, No. 4, pp. 429-437.

concern was whether these stocks show excess volatility relative to what would be predicted by the efficient markets model. The anomalies that had been discovered might be considered at worst small departures from the fundamental truth of market efficiency, but if most of the volatility in the stock market was unexplained, it would call into question the basic underpinnings of the entire efficient markets theory. The anomaly represented by the notion of excess volatility seems to be much more troubling for efficiency markets theory than some other financial anomalies, such as the January effect or the day-of-the-week effect. The volatility anomaly is much deeper than those represented by price stickiness or tatonnement or even by exchange-rate overshooting. *The evidence regarding excess volatility seems, to some observers at least, to imply that changes in prices occur for no fundamental reason at all, that they occur because of such things as "sunspots" or "animal spirits" or just mass psychology*" (Shiller, 2003; emphasis added).¹¹

Such discomfort led Richard Thaler and Shiller to start National Bureau of Economic Research conference series on behavioural finance in 1991. Various models came up for explaining such predictive failure of efficient markets. Illustratively, popular "Feedback Models" would predict when speculative prices go up, it could create successes for some investors – "this may attract public attention, promote word-of-mouth enthusiasm, and heighten expectations for further price increases".

Much of his research on behavioural finance was summed up in his path breaking 2000 book, *Irrational Exuberance*, where stylistically he argued that in many a situation the stock market can be characterized as displaying classic features of speculative bubble when, "temporarily high prices are sustained largely by investors' enthusiasm rather than by consistent estimation of real value". The book delved into a number of factors for which stock market investors would cease to be rational and the stock market would cease to be efficient such as, (a) structural factors (like precipitating factors like the internet, or amplification mechanism like naturally occurring Ponzi process); (b) cultural factors (like news media); (c) psychological factors (like herd behavior). He,

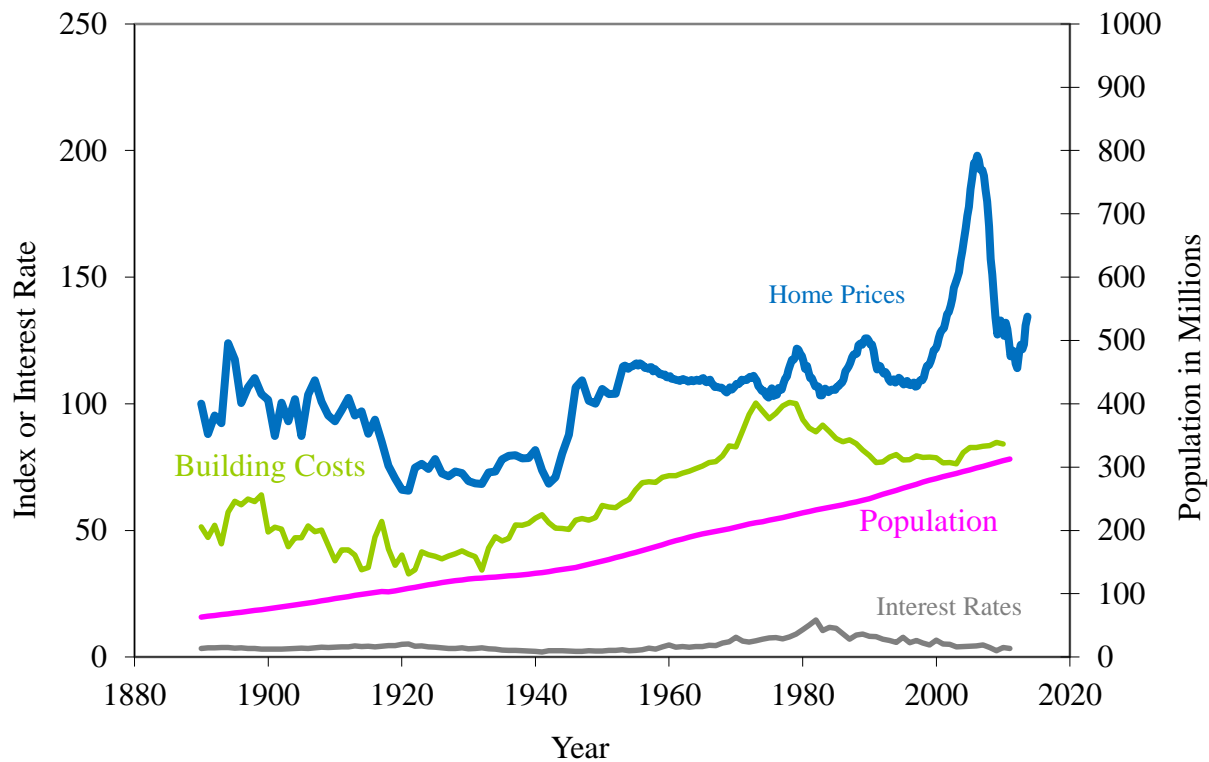
¹¹ Shiller, Robert (2003): "From Efficient Markets Theory to Behavioural Finance", *Journal of Economic Perspectives*, Vol. 17, No. 1, pp. 83-104

thus, demonstrated ample evidence that there could be speculative volatility in a free society and that the faith on efficiency on rational markets could be somewhat misplaced.

Anticipating Sub-prime Crisis

To Shiller, behavioral finance was not confined to the narrow limits of academic journals. In extending behavioral finance to real estate market, Shiller, , together with Karl Case, developed repeat-sales home price indices in the U.S. These indices are now published as the S&P/Case-Shiller Home Price Indices and the Chicago Mercantile Exchange now maintains futures markets based on the S&P/Case-Shiller Indices. In some sense, he in his 2nd edition of *Irrational Exuberance* (published in 2005) could anticipate the forthcoming sub-prime crisis. Figure 1 below captures the essential intuition in this regard. It depicts long-term trends in U.S real home prices (over 1890 – 2008) and contrasts it with three key variables which can capture the demand and supply factors in the housing market, viz., building cost, population, and interest rate (long-term government bond interest rate). Interestingly while there has been a huge spurt in real home price since 2000, both building cost and interest rate (the main supply factor) went down. Also, expectedly population growth in the US followed a steady increase. Thus, both from the demand side and the supply side, there was no reason to expect the home prices to go up in an abnormal way – implying thereby a presence of a housing price bubble, waiting to get burst. Thematically such research on housing market can essentially be seen as an extension of behavioural finance from stock market to real estate market and is linked to his research on the similarity between stock market and real estate market where it has been showed that, “changes in *housing* wealth exert effects upon household behavior that are quite analogous to those found for stock market wealth.”¹²

¹² Shiller, Robert, Karl E. Case and John M. Quigley (2005): “Comparing Wealth Effects: The Stock Market vs. the Housing Market,” *Advances in Macroeconomics*, 5(1): 1–34.

Figure 1: US Real Home Prices, Building Cost, Population and Long-term Interest Rate

Source: Shiller, Robert (2005): *Irrational Exuberance*, 2nd Edition (updated here from Shiller's subsequent book entitled, *The Subprime Solution*, 2008).

The Conscience Keeper

In his more recent writings, Shiller almost played the role of a conscience keeper in the world of finance, which to paraphrase Thomas Hobbes' *Leviathan*, seems like "nasty, brutish and short". In his 2008 book entitled, *The subprime Solution* he talked of "the promise of financial democracy" and proposed number of ideas which got reflected in the subsequent Dodd-Frank Act. More reverently, his 2012 book, *The Finance and Good Society*, proposed ways such that the discipline of finance gets more entrenched in human values so that the ever increasing rift between Wall Street and Main Street gets bridged.¹³

¹³ This issue has been dealt extensively in last anniversary issue of *Artha*. The editors of this e-magazine do not claim have any power of clairvoyance to have devoted the last issue of *Artha* to the generic theme of "Is Finance Good for the Society", before the announcement of this year's Nobel Memorial Prize in Economics!

Epilogue

It is great to see that an active researcher like Robert Shiller got the Nobel Prize for his contribution to finance which clearly went beyond the mainstream and questioned the myth of rationality of financial markets. While any discipline stands on the shoulders of the giants, it is only by questioning the existing body of theory and evidence that human knowledge makes progress. Perhaps this is the way that Ptolemy gives way to Copernicus!

Repo Market – A Tool to Manage Liquidity in Financial Institutions

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.

Introduction

Repo is abbreviated form of “Repurchase Agreement” – a form of lending and borrowing mechanism used by Central Banks and Banking and near Banking Institutions all over the world to manage liquidity. Predominantly Repos are used by an institution for managing short-term liquidity fluctuations and not for funding general balance sheet. However, institutions may use the facility to fund leveraged position-taking in various securities. A survey by European Repo Council (ERC) of the International Capital Market Association (ICMA) in June’13 found that the total value of the repo contracts outstanding on the books of the 65 institutions was EUR 6.01 trillion, compared with the EUR 5.6 trillion in December 2012, (EUR 4.6 trillion in December 2008 and the pre-crisis peak of EUR 6.8 trillion in June 2007). The U.S. repo market shrunk to \$4.6 trillion in July’13¹⁴, down 35 percent from a peak of \$7.02 trillion in the first quarter of 2008. Post Financial crisis, many regulations have been framed to make the banking business remain secure as the transmission from banking channel hurts the society most in the times of stress. Regulators feel that reforming the repo market is the top priority. They fear that repo market makes the banks vulnerable to sudden collapse should counterparties become nervous about doing business with them for some reason, as repeatedly happened around the time of the financial crisis. The repo market is believed to be a key channel through which the last Financial Crisis was transmitted. Repo being a collateralized transaction, repo

¹⁴Based on recent Federal Reserve data compiled from its 21 primary dealers.

lenders demanded higher collateral for a given level of cash lending during the crisis as asset prices declined. Investors holding leveraged portfolios of securities were required to post higher margins. The funding shortfall forced investors to selling assets which resulted in further decline in asset prices, creating a 'vicious cycle'. The problem was acute as a major part of the repo market used non-sovereign papers for the repo transaction. The financial market crisis witnessed the demand for quality collaterals as the value of the corporate papers started dipping. More recently, the regulatory focus on repo markets has intensified to ensure that the market remains stable at the time of stress. The Basel III Accord introduced quantitative liquidity requirements that stress-test large-bank funding practices and force firms to move from primarily overnight funding to longer-term financing arrangements. Additionally, the global regulators are focusing on banks' reliance on short-term funding and on reform measures to more closely link capital and liquidity regulation. These efforts is likely to materially alter the way banks fund themselves and change the repo market for the better.

Unlike global repo market, Indian repo market predominantly uses sovereign securities though repo is allowed on corporate papers. The dominance of low-risk collateral means that it is much less likely to transmit shocks to other markets in case there is stress condition in the market. Repo market in India does not pose a systemic risk to the wider financial system.

Repo Market Microstructure

Repo is defined as an agreement in which one party sells securities or the other assets to a counterparty, and simultaneously commits to repurchase the same asset, at an agreed future date at a repurchase price. The said repurchase price would cover the original sell price plus a return on the use of the sale proceeds during the term of the repo. It is a financing arrangement used primarily in the government securities markets whereby a dealer or other holder of government securities sells the securities to a lender and agrees to repurchase them at an agreed future date at an agreed price which will provide the lender with an extremely low risk return. Such a transaction is called a repo when viewed from the perspective of the supplier of the securities (the party acquiring funds) and a reverse repo or matched sale-purchase agreement when described from the point of view of the supplier of funds. Repos are hybrid transactions that combine features of both secured loans and outright purchase and sale transactions but do not fit cleanly into either classification. The use of margin or haircuts in valuing repo securities, the right of repo borrowers to substitute collateral

in term agreements, and the use of mark-to-market provisions are examples of repo features that typically are characteristics of secured lending arrangements but are rarely found in outright purchase and sale transactions. The repo buyer's right to trade the securities during the term of the agreement, by contrast, represents a transfer of ownership that typically does not occur in collateralized lending arrangements. Repos are popular because they virtually eliminate credit problems. Traced back to the birth of Federal Reserve System and to the inception of the Bankers' Acceptances market at the close of World War I (in 1918). In 1923, the Fed began to use short term repos against Governments as a tool for altering bank reserves. Central Banks around the world use Repos to moderate Money Supply in the economy by way of providing liquidity at the time of stress and absorbing liquidity at the time of excesses.

Repo markets are generally separated into markets for "general" and "specific" collateral. In case of specific collateral, a piece of specific collateral is identified in the repo contract making it possible to obtain specified securities. Repos can be divided into four broad categories – (a) Classic Repo (US style); (b) Buy-Sell Back Repo (Indian market follows this type) and (c) Securities Lending for a fee and (d) Tri-party Repo. Classic repo involves an initial sale of securities with a simultaneous agreement to repurchase them at a later date with the start and end prices of the securities are the same and a separate payment of "interest" is made. Classic repo makes it explicit that the securities are only collateral for the loan and the coupon income will be accrued to the seller of the security. The principal difference between a repurchase agreement and a buy/sell back stem from the fact that repurchase agreements are always documented, while buy/sell backs are not required to be documented as there are implicitly two separate contracts. Most of the repo terms are taken from standard legal agreements – General Master Repo Agreement (GMRA). Buy/sell-back agreements and securities lending versus cash transactions have somewhat different legal and accounting treatments but these are equivalent economic function and also referred to as repo market transactions. Under a Tripartite repo, a common custodian /clearing agency arranges for custody as well as clearing and settlement of repos transactions. The system starts with signing of agreements by all parties and the agreements include Global Master Repurchase and Tripartite Repo Service Agreements. This type of arrangement minimizes credit risk and can be utilized when dealing with clients with low credit rating.

The maturity of repo agreements typically fall into at least three descriptive categories: overnight, open and term. Overnight refers to repos with a single-day maturity (this should also typically covers repos conducted in Indian market on Fridays) and Indian market uses this form of the market quite efficiently. Term maturity refers to repos that have a fixed maturity longer than one day – recently Reserve Bank of India (RBI) introduced term repo for 7 and 14-days on reporting Fridays to mitigate the liquidity shortage in the system. Open maturity repos are those transactions where both parties have the option to terminate the repo each day. The open maturity structure permits entities in the repo transaction to continuously roll over overnight repos. In a securities lending transaction, two securities are swapped for a certain period of time. This typically happens when funds are perceived to have higher reinvestment risk which may result in bid-ask bounce for the repo seller of the securities.

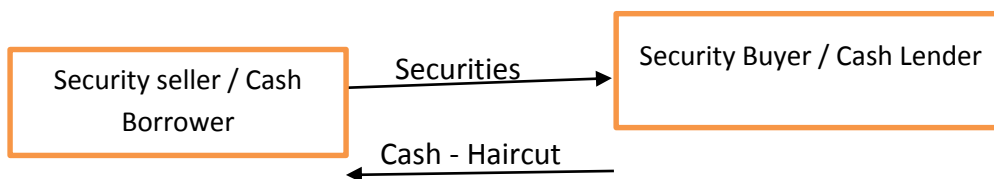
Repo are used by traders to obtain cash or to obtain securities. Repo and reverse repo are two parts of the same transaction. A bank needing cash but having required securities can enter into a repo transaction with another institution by selling the securities under repo to acquire cash. In this case, the lender of the cash uses the securities as collateral. Repo transactions are typically used to fund “long” positions in securities - used to build up leveraged long positions in securities markets. A trader uses cash raised through an initial repo transaction to buy securities which, in turn, are repoed out to raise more cash to buy more securities and so on. With each transaction the leverage ratio is increased. The maximum extent of leverage that can be built up through this process is determined by the margin or “haircut”. Haircut depends on the credit worthiness of the borrower of funds and the price volatility of the collateral. Haircuts for low-risk borrowers like banks using less-volatile collateral like sovereign bonds can be very low. Repo market is probably the lowest-cost source of leverage. In the reverse case, a bank might have short sold a particular security with a view on future price of the security and would like to borrow the same for delivery purpose. The short sale position results in cash inflows which can be used in the repo transaction to acquire securities for delivery purpose as no naked short sales are typically allowed in institutional markets. Or a bank in India can enter into a reverse repo transaction to borrow securities from another bank by lending cash but the purpose of the same is to maintain regulatory investment norms in Statutory Liquidity Ratio (SLR). As Indian market follows a buy/sell back repo mechanism, it allows the borrower of the security to use the same for achieving SLR level specified by RBI. In markets where interest rate futures are liquid, securities are borrowed to manage delivery against the deliverable

positions by the sellers in the futures market. Depending on their uses, either the securities or the cash serve as collateral for a particular transaction. In the case of specific collateral repos, the transaction enables participants to obtain particular securities issues.

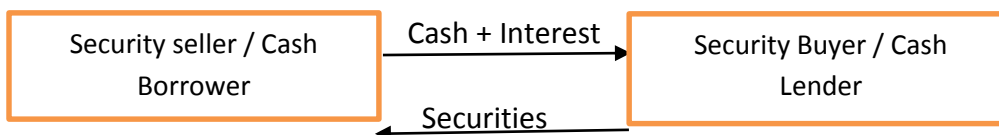
Repo yield depends on whether the transaction involves general or specific collateral. In case of general repo, the yield is roughly comparable to other short-term money market interest rates. In case of special repo, the yield reflects the value of the collateral in the securities loan. In rare circumstances, participants sometimes transact at negative special repo rates¹⁵. Repo market facilitates arbitrage and speculative activity as it allows a trader to take leveraged positions by posting a small margin. Arbitrage, market-making and speculative activity are important facet of the repo market. The repo lender of the security has to maintain inventory of collaterals and has to price the same in such a manner to recover his holding cost – the security borrower should make money from short sale deals to make the same transaction viable. The speculator takes a view on interest rate and accordingly creates leveraged positions. Direct trading of the repo rate itself is commonly known as matched-book trading. It involves the borrowing of securities or cash through the repo markets with the intention of re-lending the cash or securities at more favorable rates in the same market. A Speculative trading activity involves taking a position on the basis of forecast of the direction of interest rates - speculating on the future direction of repo rates. If a trader expects rates to rise, one could borrow money for term and lend money overnight.

Figure: 1: Repurchase Agreement Structure

First Leg (Ready leg): Initial Transaction



Second Leg (Forward Leg): Forward Contract



¹⁵ When the chance of penalties is high for failure to deliver the security.

The above figure can be better explained using an example of Buy/Sell Back Repo. Bank A would like to do a repo to borrow funds from Bank B using a security (7.16% GOI 2023 issued on 20-May-2013) on Oct 21, 2013 for 21 days (repayment on Nov 11, 2013) for a Face Value of Rs.500million at 8.36%. The underlying bond is trading at 8.80% for settlement on Oct 21, 2013. The underlying security has a Clean Price of Rs.89.5197 (using 30/360E criteria) and has 151 days of accrued interest amounting to 3.0032 giving us a Dirty Price of Rs.92.5229. The consideration in the First Leg (Ready Leg) becomes Rs.462, 614,725. The repo interest will be charged on the above funds at 8.36% for 21 days. The same works out to Rs.2, 225,113 using Act/365 criteria. So the Borrower (Bank A) will pay to Bank B Rs.464, 839,838 on Nov 11, 2013 and take back the security. But in a Buy/sell back repo, the transaction is divided into two separate deals – in the second leg the repayment becomes the consideration and the Bank B must account the same in terms of a Clean Price and Accrued Interest. This is done to have proper accounting in the books as Clean Price is a part of the Balance sheet (Asset side when it enters the book) while accrued interest is absorbed in the Profit and Loss Account. The repayment amount in the second leg (forward leg) can be converted into a Dirty Price of Rs.92.9680 out of which 3.4010 is the accrued interest for 171 days¹⁶ as on 11-Nov-2013. The implied Clean Price will be the difference between Dirty price and Accrued Interest. The same will reenter the Books of Bank A at Rs.89.5670 resulting in a small capital gain as it left the Book at Rs.89.5197. For Bank B, it can be a capital loss and can be leveraged for Tax purposes. By doing the repo deal at the agreed rates, the traders have also given their expectation about the future yield of the bond. The forward price of Rs.89.5670 implies a yield of 8.80% for the security on 11-Nov-2013. This implies that traders do not expect much change to the yield curve in next three weeks – expectation of a flat yield structure for next 3 weeks.

An important distinction between repo lending and a collateralized loan is that legal ownership of the security is transferred to the lender of funds which provides the repo lender with better control over the collateral in case the counterparty defaults. At times, repo transaction also provides for collateral substitution rights to the lender of security. Right of substitution may make the repo transaction restrictive as the borrower of the security has to maintain the collateral inventory or

¹⁶ The repo interest is for 21 days while bond interest accrued is for 20 days – the one day shortfall is because of the different day count convention used for repo market (ACT/365) and bond market (30/360E).

should be in apposition to borrow the same through another repo transaction if the lender of the security demands the same.

Indian repo market is predominantly an overnight repo market – dominated by banks and institutions. The market uses sovereign securities as collateral. The repo market in India was a pure OTC market where both lenders and borrowers to talk to each other to finalize a deal. The anonymous online repo dealing system introduced by Clearing Corporation of India Ltd. (CCIL)¹⁷ helped the market to go for a radical change – moving from OTC market to an anonymous order driven market resulting in true price discovery of the repo yield. It provides for both General (Basket) and Special repo dealing. Large part of the repo market moved to this platform while very small part still remains outside this platform.

The trading activity in repo market indicates leverage positions taken by traders. A relatively higher volume in Special window would indicate traders are borrowing specific securities for their leveraged positions like delivery against short sale position or delivery against a forward contract like Interest Rate Futures. Buyers of the securities (having long positions with an interest rate view) in the outright market may also use the security in repo window to lend the same to other users. If the trading activity in the Basket window is higher, it would indicate traders are using the same more as a collateral to lend funds or some traders may be using the same for regulatory purpose like maintaining SLR.

In Indian market Repo market has three different segments – RBI Repo (daily LAF at a fixed rate), Market repo among banks and institutions at market determined rates and Collateralised Borrowing and lending Obligations (CBLO) – a repo variant with the combined structure of held-in-custody and tripartite repo in which the contract can be traded unlike other standard repo in which the security under repo can be traded but the contract cannot be unwound till the end of the contract. CBLO market has been the most liquidity form of the short term market with more than 60% of the short term market share. CBLO provides an anonymous order matching system for trading funds against the collaterals in the form of Government securities which are immobilized at the service provider.¹⁸

¹⁷ CCIL introduced CROMS platform in Jan'09 for allowing institutions to deal in repo using both Basket and Special windows.

¹⁸ CCIL offers CBLO trading platform for the market participants to trade. The system allows non-bank entities like Non-Banking Finance Companies, Large Corporates investing in Government securities, Large Oil Companies, etc. having stocks of Government bonds issues to support oil pool deficit.

CCIL allows entities to borrow from the market against Government securities after applying the applicable haircuts to manage risk. Both Market repo and CBLO trades are guaranteed by CCIL which plays the role of a CCP¹⁹.

Central Bank Repo

Central Bank Repo is one of the oldest instruments of monetary policy. Federal Reserve started using a type of repo in 1920s while Bank of Canada used repos since 1953. Bank of England started using repos with government securities in 1997 but and Japan and Switzerland started using repos in 1997 and 1998, respectively. Canada, Italy and Sweden use the buy/sell-backs while Japan uses securities borrowing with cash collateral. The Netherlands uses a special loans system in which loans are collateralised via pledge on a pool of collateral (general). Most of the countries use the form of repo keeping in mind the legal and institutional framework that prevails in each country. The use of repos as a monetary policy instrument is more justified from the fact that repos are well suited to influence the interest rate level through two of the main channels used to implement monetary policy - for moderating or controlling liquidity in money markets and an effective mechanism for signaling to markets the desired level of interest rates. A central bank repo indicates the rate at which the Central Bank is willing to lend money against acceptable collaterals to Banks – to infuse liquidity to the system where there is shortage of funds. Most central banks follow an interest rate corridor to set a rate below the repo rate at which the Central Bank is willing to absorb excess liquidity in the Banking system if the need arises. So the repo and reverse repo rates indicate both support and resistance level for money market funds. The market logically has to operate within the interest rate corridor as a trader having excess cash would demand the minimum rate from a borrower of funds which she can get from the Central Bank by pledging excess cash with her. If a bank has faced shortage of liquidity, then it can approach the Central bank with acceptable collaterals to pledge and borrow funds at the repo rate. By changing repo rate, the central banks indicate the interest rate direction. A shift in monetary policy can be signaled by adjusting the interest rate corridor. Central Banks use repo to infuse liquidity to the system. During financial crisis, central banks around the world infused unprecedented level of liquidity to the financial system by lower the quality of acceptable collaterals thereby facilitating availability of credit to the economy from the banking system. McAndrews et al. (2008), Ashcraft et al. (2009), and Christensen et al.

¹⁹ Central-Counter Party guarantees settlement of all trades in Market repo and CBLO.

(2009) find that the liquidity measures adopted by the Federal Reserve were effective during the 2007-08 financial crisis. When liquidity dries up, central banks have two unique abilities: to provide liquidity in sufficient amounts in response to abnormal shocks (Bhattacharya and Gale, 1987; Acharya et al. 2008) and to diversify risk across many illiquid banks (Flannery, 1996; Rochet and Vives, 2004).

RBI uses a system called Liquidity Adjustment Facility (LAF) for moderating liquidity situation in the banking system. It has specific timing window (typically at the beginning of market hours) within which banks are required to access funds or park funds in which RBI is the counter-party. The rates at which such transactions take place are fixed and are changed by RBI from time to time depending upon its monetary policy considerations. Currently, it uses repo rate for lending money to Banks and Primary Dealers against acceptable Government securities. However, it currently restricts the said borrowing with a cap of 0.5% of the Net Demand and Time Liabilities (NDTL) of a Bank. In case the Bank still requires more funds, it can access another window called Marginal Standing Facility (MSF) to borrow funds upto 1% of its NDTL. Recently RBI introduced a longer term repo under 7-day and 14-day on Reporting Fridays²⁰ windows with a market determined interest rate using auction mechanism. RBI also conducts LAF fixed rate repo auction second time in the afternoon on reporting Fridays to ensure that the liquidity is fully absorbed though currently it opens a second LAF to allow banks to park surplus funds with RBI. The RBI has also made changes to the MSF window timing making it the last time slot (7PM – 7.30PM) in the banking channel for borrowing funds from RBI.

Repo is useful for monetary policy because they have a number of features: (a) it carry a low credit risk as they are collateralized; (b) they are relatively flexible and their features can be tailored by central bank according to liquidity conditions; (c) it does not affect securities prices or yield curve in general; and (d) Central banks can reach out to a broader range of institutions in case of need (viz. extending facility to select non-bank entities at the time financial crisis). Repo market also gives the credit spread to understand the stress in the market. The spread between clean Call rate and Market Repo Rate gives the perceived credit risk in the system. At the time of stress, the spread widens and at the time ample liquidity, the spread shrinks.

²⁰ Alternate Fridays are reporting Fridays for Banks in which their NDTL is calculated for Regulatory maintenance of Cash Reserve Ratio and Statutory Liquidity Ratio.

The securities used in the RBI daily LAF repo by a Bank (while borrowing money from RBI) can be considered under SLR requirement while the reverse repo deals entered with the RBI by a Bank does not provide SLR benefit as RBI does not use a pure Buy/Sell Back mechanism but credits the securities to a kind of pool account and not to the account of the individual Subsidiary General Ledger (SGL)²¹ account of the Banks.

Market Activity

In Indian market, RBI support to the banking system through daily LAF has been a major liquidity management tool since its inception. However, the substantial liquidity injected²² to the banking system in a very short span of time soon after the financial crisis resulted in interest rates moving to their lowest levels in short term money market and Treasury bills market. Since June'10, RBI has been continuously supporting the market with infusion of liquidity through daily LAF.

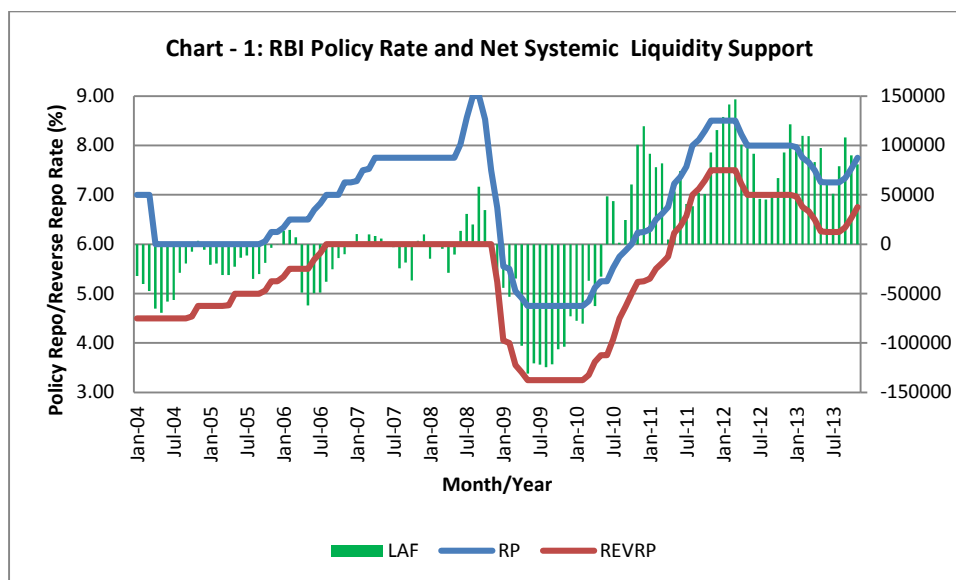
Table -1: RBI Injection of Liquidity to Banking System (Apr'07 to Nov'13)	
Parameters	Net RBI Support (Rs. Crore)
Mean	7871
Standard Error	5890
Median	-1696
Standard Deviation	64252
Minimum	-130978
Maximum	146789
Months	119

Historically, the current stretch has been the longest period in which banks have been continuously borrowing funds from RBI (almost 42 months with a daily average borrowing of more than

²¹ Banks have to maintain SGL account with RBI for keeping their Securities balances.

²² RBI injected about Rs.500 ,000Crores (1Crore is 10million) in a short span of time to fend off the impact of financial crisis on Indian financial system.

Rs.75000crores which is almost 1% of the current NDTL of the banking system). However, at times the liquidity support has been very high and touched about 2% of the NDTL of the banking system.



Net support to the banking system has a positive correlation with the policy rates – with Repo rate about 68% co-movement and with reverse repo about 78% co-movement. In recent times, Banks have been continuously borrowing funds from the RBI. In 2009, the banks parked large sum of funds with the RBI in reverse repo window due to availability of excess liquidity in the system (as a fallout of financial crisis). Daily money market activity has not seen substantial variation during 2004-2013 and remained at about 1% of NDTL. Daily RBI LAF window witnessed wide variations in liquidity as Banks have to manage systemic liquidity with the help of this window.

Table -2: Repo Rate, Spread, LAF Support and Market Activity (Daily Average)

Year	Repo Rate	Rev. Repo Rate	Call Rate	Spread	Net LAF Support	Money Market activity ²³
2004	6.25	4.54	4.60	0.39	-35600	15195
2005	6.05	4.96	5.10	0.19	-19858	22969
2006	6.78	5.74	6.42	0.37	-21748	35794
2007	7.67	6.00	6.65	1.00	-6334	48917
2008	8.01	5.94	7.74	0.60	5146	56466

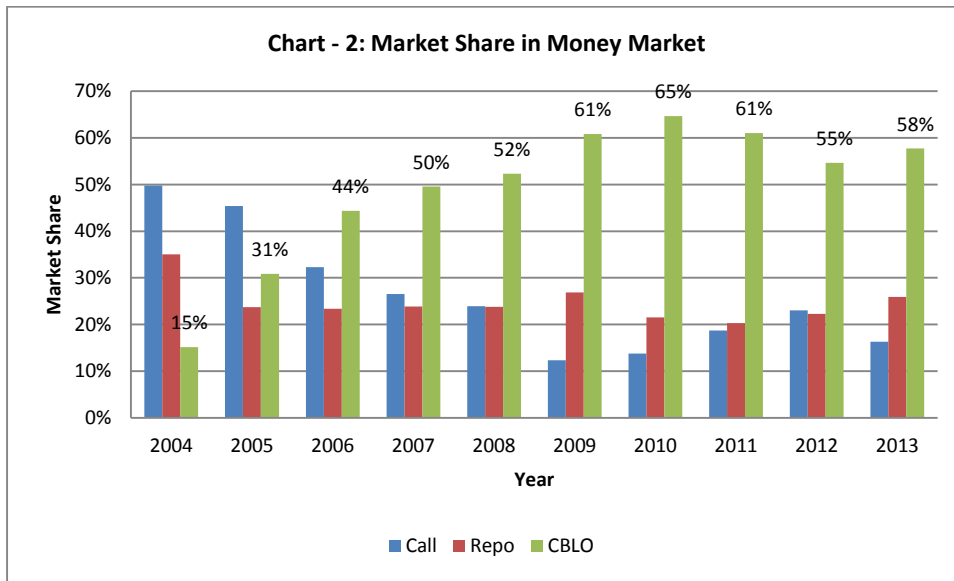
²³ Total daily average trading activity in Call, Repo and CBLO markets.

2009	4.92	3.42	3.47	0.60	-94805	81625
2010	5.47	4.15	4.90	0.59	9063	69913
2011	7.48	6.48	7.55	1.01	64524	67252
2012	8.14	7.14	8.30	1.29	94044	70678
2013	7.50	6.50	8.16	1.22	88788	97167

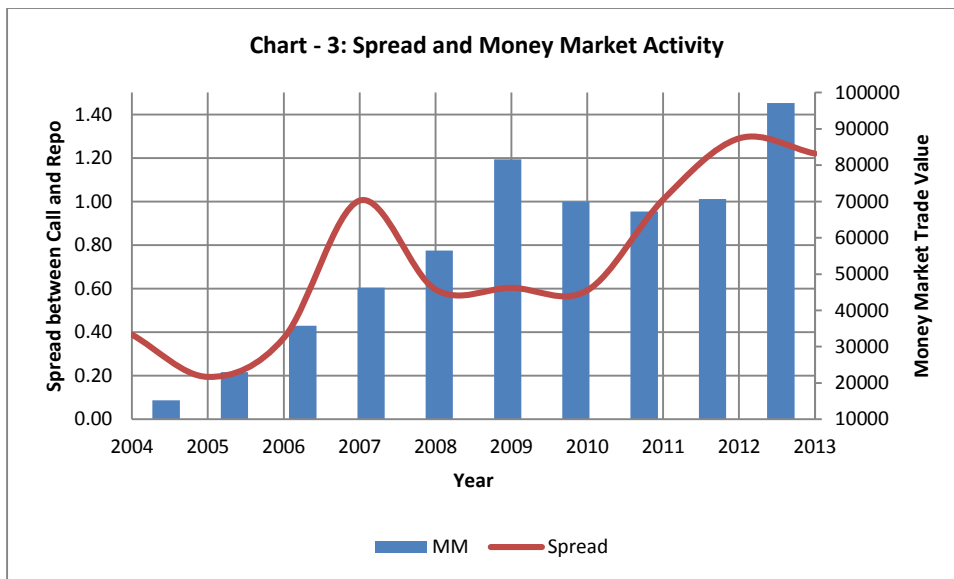
Market has been using RBI LAF system as a most important support system to ensure the proper liquidity management. However, fixed policy rate repos provide direction of the interest rate in the market. The market uses the said information to firm up other interest rates in the system like inter-bank call, market repo and CBLO rates. These three forms of short term market in India forms the backbone of the money market system and these rates typically hover around the policy rates – at the time of excess liquidity in the system, the rates are around the reverse repo rate while at the time of shortage, the same hovers around repo rate. The introduction of CBLO changed the structure of the Money market in India. Before 2004, the market heavily depended on uncollateralized overnight inter-bank call market for funding. RBI made some policy changes and restricted the exposure to uncollateralized market by putting exposure controls as high dependence on uncollateralized call market envisaged systemic risk to the entire system. In Jan'04, uncollateralized call market accounted for 62% of the market share while market repo accounted for 35% and CBLO accounted for less than 3% of the market share. Non-bank entities²⁴ (excluding Primary Dealers) were phased out from the uncollateralized call market and were advised to move to collateralized markets like Repo and CBLO. As of October'13, the CBLO accounted for about 59% of the market while market repo accounted for 28% market share and uncollateralized call market accounted for 14% of the market share.

RBI has been successful in moving larger volumes in the short term market to the collateralized segment from the clean call market. This has helped in removing systemic risk as well as created demand for securities as traders have to hold securities against which they can borrow funds from counter-parties.

²⁴ Non-bank entities like Mutual Funds, non-Banking Finance companies and Insurance Companies were typically lenders in the call market and were phased out from the call market in a calibrated manner.



Money Market consolidated trading activity indicates the level of liquidity absorbed by the system. It has a very strong correlation with the systemic liquidity support from RBI. The correlation between absolute of net RBI LAF activity and consolidated money market volume has been found to be about 53% (monthly data from Jan'04 to Nov'13) while the correlation between the spread between Call and market repo rates and consolidated money market volume is about 31% (monthly data Jan'04 to Nov'13) while with daily LAF, the correlation was 44%.



Interest Rate Corridor as measured by the difference between policy Repo and Reverse Repo rate had expectedly negative correlation with LAF (-35%) and Money market activity level (-22%). The short term market predominantly remains a pure overnight market and hence is exposed to high

roll over risk. It will be interesting to see how far the recent introduction of term repo of 7 and 14-day on reporting Fridays is going to help in developing the term market in India.

Table – 3: Pearson Correlation Coefficients							
Prob > r under H0: Rho=0							
	CV	RV	CBV	Spread	MM	LAF	Abs
CV	1	0.85	0.79	0.68	-0.05	0.10	-0.20
		<.0001	<.0001	<.0001	0.604	0.33	0.041
RV	0.85	1	0.74	0.55	-0.06	-0.15	-0.24
	<.0001		<.0001	<.0001	0.564	0.125	0.014
CBV	0.787	0.743	1	0.50	0.22	-0.02	-0.07
	<.0001	<.0001		<.0001	0.022	0.878	0.503
Spread	0.68	0.55	0.50	1	0.31	0.44	0.36
	<.0001	<.0001	<.0001		0.001	<.0001	<.0001
MM	-0.05	-0.06	0.22	0.31	1	0.26	0.53
	0.60	0.56	0.02	0.001		0.004	<.0001
LAF	0.10	-0.15	-0.02	0.44	0.26	1	0.25
	0.33	0.13	0.88	<.0001	0.004		0.01
Abs (LAF)	-0.20	-0.24	-0.07	0.36	0.53	0.25	1
	0.04	0.01	0.50	<.0001	<.0001	0.01	

At the time of severe liquidity crunch, the rates move to unprecedented high levels. The volatility measured by the difference between daily high and low call rates and the spread between daily call and market repo rate have a correlation 0.68.

Table – 4: Descriptive Statistics of Volatility, Spread and market Activity						
Variable	N	Minimum	Maximum	Mean	Std Dev	Range
MM	119	10323	116450	55987	26097	106128
LAF	119	-130978	146789	7871	64252	277766
Abs	119	13	146789	51160	39387	146775
Spread	119	0.04	5.14	0.72	0.64	5.10
CV	106	0.76	13.92	2.10	1.48	13.16
RV	106	0.30	7.45	1.15	0.81	7.14
CBV	106	0.28	5.43	1.35	0.89	5.15
MM – Daily Money market activity; Abs – Daily average LAF support (absolute); CV, RV and CBV– Volatility in Call Repo and CBLO markets						

Securities Used in Repo Transactions

Repo transactions in Indian repo market use mostly Government securities though corporate bonds can be used for such transactions. Very few transactions take place using corporate bonds. Though market has a choice of using different permissible Government securities like Floating Rate Bonds, State Development Loans, Special securities like Oil Bonds issued by Government to fund oil pool deficits (subsidy payments), and Treasury Bills, traders have been using pure Government securities though in recent time, the Treasury Bills have been contributing to a sizeable share in total repo deals. This increase in market share for Treasury Bills is mainly due to high value of Treasury Bills issued since last three years²⁵.

²⁵ Government has issued high value of short term Treasury Bills and Cash management Bills in the aftermath of Financial crisis. The notified amounts for Treasury Bills have increased substantially in recent times.

MATURITY	Deals	Value	Share	Cumulative
< 1	4727	1190017	5.66%	5.66%
1	12103	3093265	14.72%	20.39%
2	13475	3071121	14.62%	35.00%
3	7213	1622740	7.72%	42.73%
4	8462	1970000	9.38%	52.10%
5	9192	1728779	8.23%	60.33%
6	6396	802253.8	3.82%	64.15%
7	7915	1263331	6.01%	70.16%
8	6195	921031.5	4.38%	74.55%
9	9545	1062864	5.06%	79.60%
10	15383	1812031	8.62%	88.23%

Traders use the repo market in India more for liquidity management and less for managing portfolio of securities as can be seen from the portfolio of underlying securities used in the repo transactions. The market uses very short term securities and securities upto 2 years account for 35% of total repo deals in terms of value.

Table – 8: Descriptive Statistics of Securities used in Repo Transactions					
Year 2007					
Year	FRB	GS	SDL	SPL	TB
Securities	4	48	44	18	101
Value	1841	2234434	26481	253690	240102
Share	0.1%	81.1%	1.0%	9.2%	8.7%
Deals	55	13633	797	2945	2194
Year 2008					
Securities		50	50	25	106
Value		2863365	56792	635302	346845
Share	0	73.4%	1.5%	16.3%	8.9%
Deals		14336	1022	5710	2005
Year 2009					

Securities	1	58	75	22	120
Value	466	4936353	27613	327974	905559
Share	0.01%	79.6%	0.4%	5.3%	14.6%
Deals	9	21308	918	3331	5277
Year 2010					
Securities	1	61	62	15	133
Value	16728	3316671	16500	190150	847600
Share	0.38%	75.6%	0.4%	4.3%	19.3%
Deals	215	17931	703	2091	5864
Year 2011					
Securities	1	62	67	7	151
Value	55503	2202319	19475	206255	1468191
Share	1.40%	55.7%	0.5%	5.2%	37.2%
Deals	324	16383	571	1900	9619
Year 2012					
Securities	1	64	92	7	148
Value	103000	2256932	70177	78166	2101344
Share	2.2%	49.0%	1.5%	1.7%	45.6%
Deals	825	21145	1054	635	15087
Year 2013					
Securities	1	62	66	3	139
Value	1861	3200473	24508	1068	2831606
Share	0.0%	52.8%	0.4%	0.0%	46.7%
Deals	23	22618	543	22	16007

The most liquid securities in the underlying outright market are typically benchmark securities like 10-year and 5-years bonds. The markets share of these securities in repo deals is about 8% each vis-

à-vis about 40% for 10-year bonds in outright underlying market. From the behavior of the repo market transactions, it can be implied that the market uses the repo deals to manage liquidity and not for leveraging securities portfolio holding. This may be due to the fact that the lending side of the market in repo is dominated by Insurance Companies and Mutual funds who typically do not have trading interest in securities and accept the securities as collaterals against funds lent. As the market does not witness significant short selling or as there is no Interest Rate Futures (IRF) market in India which requires borrowing of securities for delivery against obligations.

Understanding and Exploring Auditor Switching in India

Kaustav Sen



Kaustav Sen received his B.Tech from IIT, Kharagpur and PhD from Rutgers University, New Jersey. He is a faculty member at Pace University, New York. He researches how accounting information and corporate governance affect behavior of the capital markets and teaches financial statement analysis and valuation. He has visited and taught at other institutions, including IIM Calcutta, Hong Kong Poly, Rutgers and Montclair State. He has also been a consultant to Prudential Financial, GE Capital, JP Morgan Chase and New York Life.

The causes and consequences of switching auditors have been the subject of many studies for more than two decades. In this piece, I revisit various arguments offered in the literature for auditor switching and ask if they can be valid in the Indian context. I also present summary data on the evidence of auditor switching in India. My goal is to make the reader aware of the auditor switching phenomenon and its implications in the Indian context.

Past Research

A recent review by Stefaniak et al. (2009) categorized the literature into the historical context of auditor switches, auditor-initiated switches, client-initiated switches and mandatory firm rotations. Almost all of the academic research on auditor switching has focused on the US market. So the papers documenting the effect of historical events that have influenced auditor switching are based on the events in the United States. However, the lessons learnt do have implications for other markets as well.

Richardson (2006) suggests there was an anomaly in auditor switching behavior during the Great Depression, during the 1920-30s. Before the Great Depression began, firms switched from a smaller to a larger auditor in accordance with the normal behavior, as firms were becoming bigger. However after the Depression set in, the switches were from larger to smaller auditors, perhaps because larger auditors were resigning from troubled firms in order to manage their risk portfolios. Identifying an exogenous shock or a natural experiment to study auditor switching certainly

eliminates endogeneity concerns that econometricians worry about. But implementing it in the Indian context will need careful screening of such exogenous shocks and availability of auditor data.

Another event that initiated auditor switching was the Leventhal and Horwarth (L&H) bankruptcy in 1990. This was the largest audit firm failure before the demise of Arthur Andersen in the wake of the Enron crisis. Menon and Williams (1994) found that L&H clients that switched to a Big N auditor exhibited a favorable market reaction compared to those that switched to non-Big N client. They concluded that this was confirmation of the insurance hypothesis, which suggests that audits provide implicit insurance to investors. Furthermore, in the event of an audit failure, large audit firms provide greater insurance due to deep pockets. Given the legacy of the Indian capital markets, where auditors are typically never sued in the case of an audit failure, an interesting question to examine will be whether the insurance hypothesis is valid in the Indian context. To say the least, it needs careful thinking, since rejecting it implies lower accountability of the auditors in discharging the duties of the attestation function.

The most significant historical event that led to auditor switching was the Enron scandal followed by the collapse of Arthur Andersen (AA) and enactment of Sarbanes-Oxley (SOX) in 2002. There have been several studies on switching behavior of AA clients after it collapsed: Blouin et al (2007) found that they followed the AA team except where agency costs were high e.g. more complex companies, outside blockholders. There were several resignations after the passage of SOX by small firms since they thought that the oversight by the regulators had increased considerably (see Read et al, 2004). Something similar occurred in India as well. Dubbed as India's Enron, the Satyam fraud led to the arrest of two partners at the audit firm PriceWaterhouse Coopers (PWC), followed by client and staff defections. However, the clear difference between the US and Indian event is the fact that unlike the fate of AA in the United States, PWC continues to be a leading auditor in India.

Auditor-initiated switching occurs when clients are under financial distress (Schwartz and Soo, 1995), or litigation risk increases (Krishnan and Krishnan, 1997) or when the cost of conducting an audit increases (Hackenbrack and Hogan, 2005). The earliest paper on client-initiated auditor switches is Chow and Rice (1982), which examines whether US firms engage in opinion shopping after receiving a 'qualified' audit opinion. The study does not find any evidence that firms that switched auditors after receiving a qualified opinion received a clean opinion in the following year. This was reassuring, allaying any concerns of widespread lack of audit independence during the

period of the study. Schwartz and Menon (1985) find that financial distress, but not audit qualifications or management changes, cause a firm to switch auditors in the United States. In an Australian setting, Craswell (1988) finds that firms switch auditors after they receive a serious audit qualification, and the new auditor gives an unqualified opinion, which does not bode well for the state of audit independence during the period of the study. India provides a rich setting to study the auditor switching, where standalone firms that depend on the capital markets for funding coexist alongside with business group affiliated firms which can easily tap into the group's coffers for funding. And then there are the public sector enterprises, where the government auditor (Comptroller and Auditor General of India) has the final say, although these public sector firms do engage private sector auditors as well. Can the reasons for switching auditors among the various types of businesses be motivated by different reasons, and what implications should outside investors draw when they observe an auditor switch?

Turning to evidence from the stock market, Teoh (1992) finds that there is a positive market reaction if auditors are switched due to a mechanical rule rather than because of an adverse opinion. Such a switch can be good news for investors, as it separates out the better firms that have been underassessed from poorer firms. Krishnan (1994) argues and finds that auditor switching is not triggered by receipt of qualified opinion, but by the auditor conservatism, which is the tendency to issue to qualified opinions. The threshold value of this tendency is lower for a switcher as compared to a non-switcher. Krishnan and Stephens (1995) compare the threshold values for switching firms with non-switching firms, both before and after the switch, and find no evidence that switching firms were treated less conservatively by the auditors. Lin et al. (2009) find that firms that switch to large audit firms (top 10) in China exhibit better quality earnings and the market responds to it by pricing the stock favorably. From the cost to the client perspective, Pearson (1994) finds that there is a significant audit fee discount when a market leader is replaced by another market leader. However, there is no evidence of fee reduction when firms switch from a nonleader to a market leader. The Chinese evidence may be a good indicator of what can be expected to be valid in India given that both are developing markets, where firms are trying to raise capital by increasing their efforts to provide timely and accurate information. Essentially, auditor switching to build credibility in order to raise capital should be the most dominant explanation in emerging markets, where other factors such as auditor deep pockets or shopping for an opinion may not matter much.

Compared to the classifications of auditor switching listed in the paragraphs above, the literature on mandatory auditor rotation is relatively short. In an experimental set up, Dopuch (2001) finds that in the absence of mandatory audit rotation, the participants acting as auditors, are more likely to issue reports favoring the management. Vanstraelen (2003) finds that in Belgium, where the law requires that auditors have to be engaged for a period of three years, clients are four times more likely to switch auditors at the end of the mandatory term if they receive a qualified opinion in the final year relative to the previous two years. This evidence suggests that mandatory terms influence the relation between auditor switching and qualified opinions. The Indian Companies Act of 2013 allows for a maximum of two five year terms for engaging an auditor followed by a mandatory rotation. Implementing it certainly has challenges, and only time will tell whether the benefits in terms of increased audit independence will outweigh costs.

In summary, the theoretical reasons why firms switch auditors can be multiple. The analysis presented in the next section is exploratory. The goal is to gain some insights into what may be some of the reasons why Indian firms switch auditors. So none of the above hypotheses may be confirmed in the Indian scenario, since there can be other reasons in emerging markets that can also drive auditor switches.

Trends in India

I present some evidence on the incidence and characteristics of auditor switching in the Indian context, using a sample of all firms (as defined by Prowess) listed on the Bombay Stock Exchange (BSE) A and B groups as on 1st September, 2011. The sample covers a 10-year period, from the financial year 2001-02 to 2010-11. The sample starts from the first year when corporate governance data became available; the K. M. Birla committee recommended that all listed firms must file a Corporate Governance Report from 2001-02. All required data are annual and have been extracted from the CMIE database Prowess.

Table 1: Auditor changes

The table below provides the number of firms that have changed auditor, classified by year. Also provided are the firms in the sample that have not changed auditors.

Year	No-change	Change	Total
2001	1,839	165	2,004

2002	1,811	209	2,020
2003	1,820	195	2,015
2004	1,865	186	2,051
2005	1,866	247	2,113
2006	2,016	278	2,294
2007	2,111	269	2,380
2008	2,131	277	2,408
2009	2,121	271	2,392
2010	1,764	197	1,961
Total	19,344	2,294	21,638

The first piece of evidence relates to the incidence of auditor switching. From Table 1, we observe that about 11% of the firms switch auditors every year, with some variation from one year to another. The years 2001 and 2004 had fewer switching, whereas the rates were higher in 2005, 2006 and 2008. There are a total 2,294 incidents of auditor switching during the 10 year period.

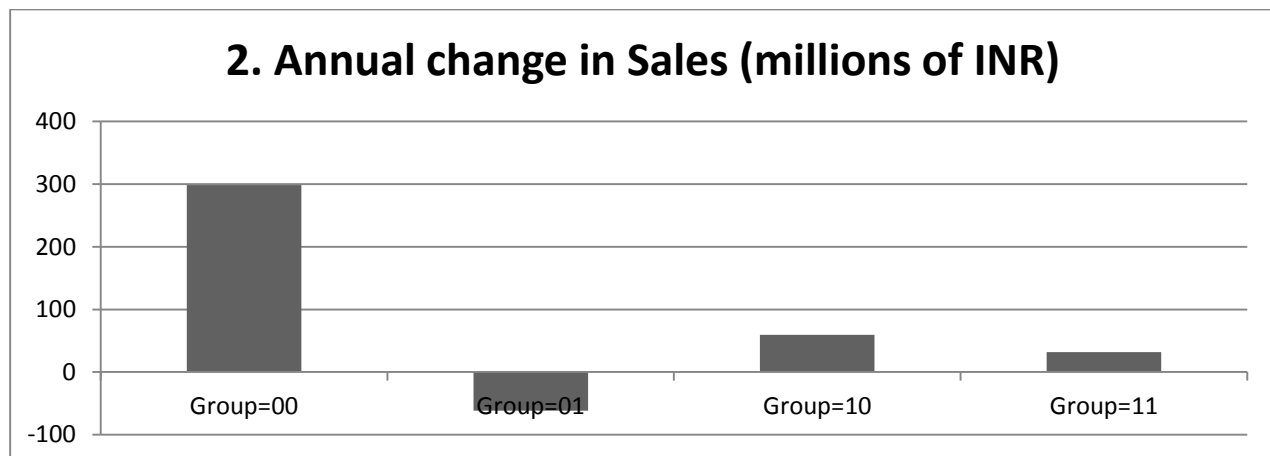
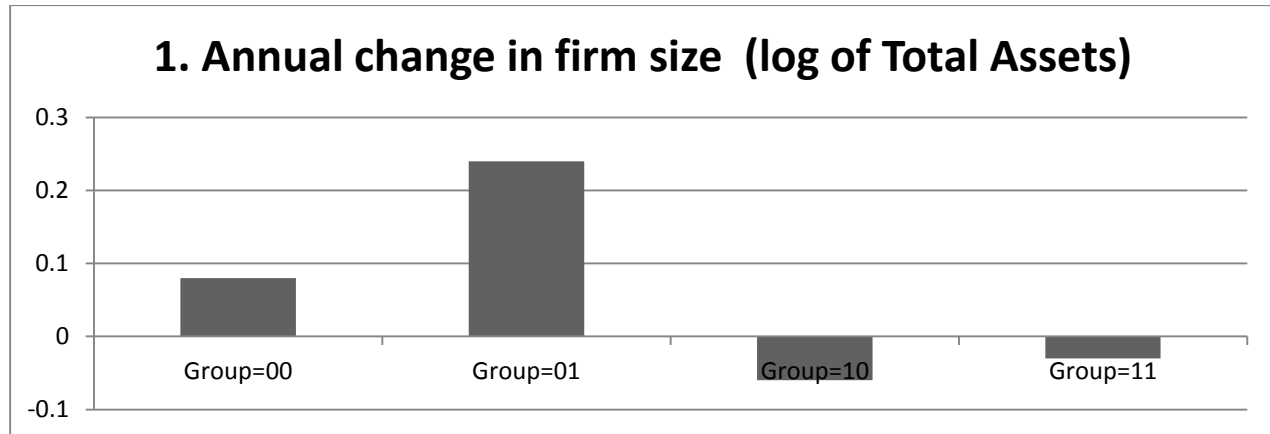
Table 2: Type of auditor change

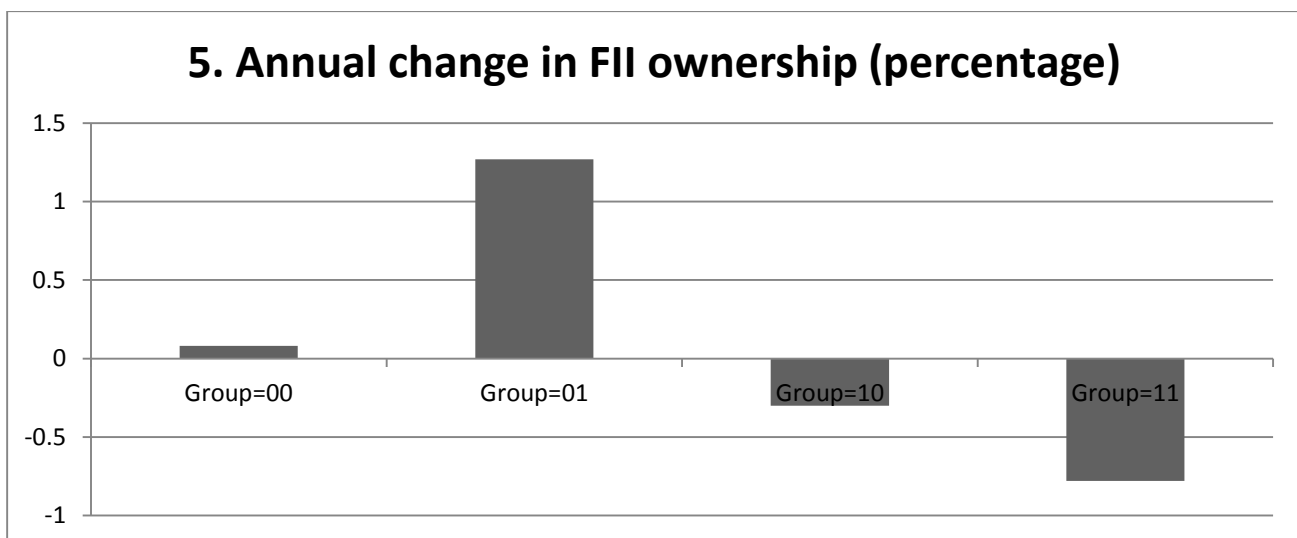
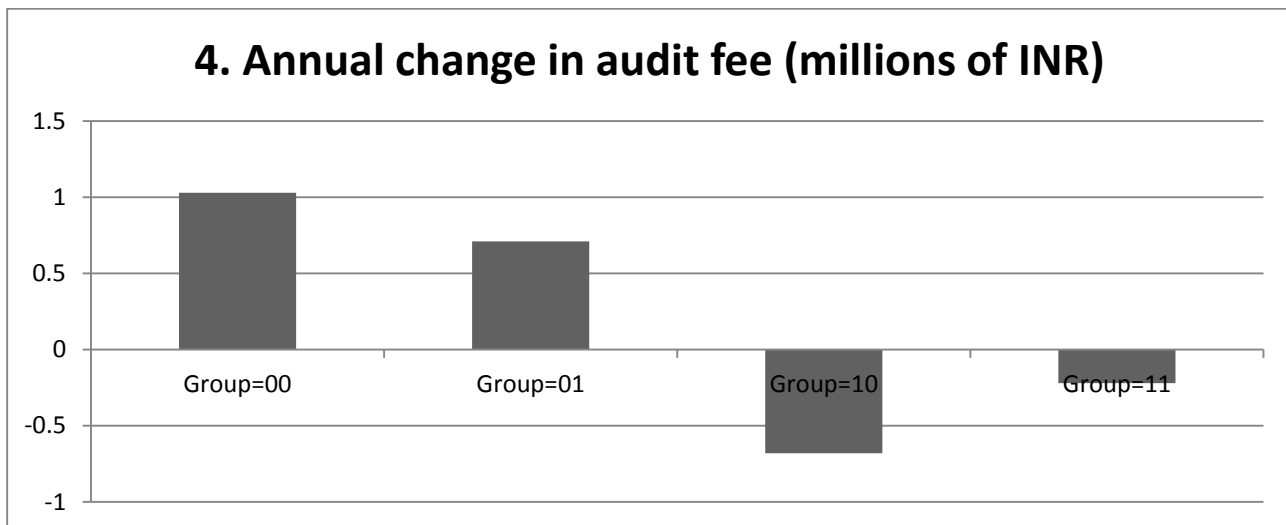
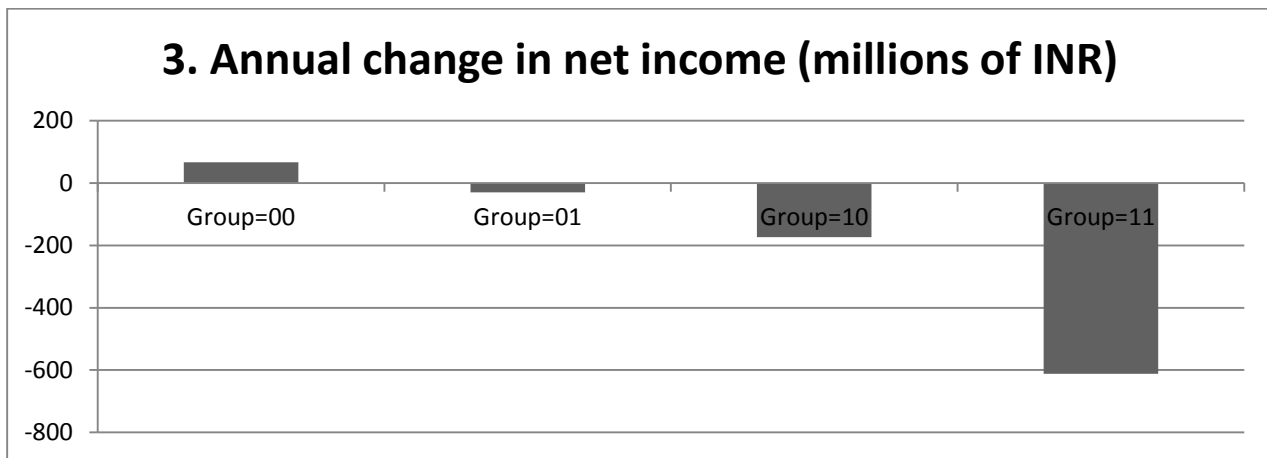
The table below provides the number of firms classified by the type of the auditor change. An auditor is classified as Big 4 if it is affiliated to one of the four big audit firms: PWC, Deloitte, KPMG and Ernst & Young. In particular, PWC associates include Price Waterhouse, Lovelock & Lewes and Dalal & Shah; similarly, Deloitte associates include Deloitte & Touche, Deloitte, Haskins & Sells, A F Ferguson, S B Billimoria and Fraser & Ross.; KPMG associated firms are B S R; Ernst & Young associated firms are S R Batliboi and S V Ghatalia. An auditor who is not associated with one of the four big audit firms is classified as Non-Big 4.

From	To	Group	Count	Cumulative Count
Non-Big 4	Non-Big 4	00	1,764	1,764
Non-Big 4	Big 4	01	208	1,972
Big 4	Non-Big 4	10	99	2,071
Big 4	Big 4	11	223	2,294

Table 2 provides more details into the type of switch. The majority (77%) is from a non-Big 4 auditor to another non-Big4 auditor, where Big4 auditors are those audit firms that are affiliated to one of the global Big4 audit firms: PriceWaterhouse Coopers, Delloite, KPMG, and Ernst and Young. Another 10% of the switches are from one Big4 to another Big4 auditor. Comparing the other two categories tells an interesting story: about 9% of the firms (208) switch from a non-Big4 to a Big4, whereas only 4% (99) switch from a Big4 to a non-Big4. So the trend indicates that firms are moving towards bigger auditors.

The next piece of evidence focuses on the characteristics of the firms that switch auditors in each of the four groups listed in Table 2. Figures 1-5 plots the characteristics of firms for each of these four groups.





Figures 1-5

The first three plots relate to fundamental firm characteristics. Firms that were audited by Non-Big4 auditors became bigger (figure 1), the largest increase for those that switched to a Big4 auditor.

However, the firms that continued to be audited by Non-Big4 auditors outperformed the other three groups both in terms of increase in sales (figure 2) and profits (figure 3). The firms that were initially audited by a Big4 auditor became smaller in size and showed a drop in profits whenever they switched auditors. While it is not possible to tell from these simple charts whether the changes were motivated by opinion shopping or reputation building, it is possible to observe the distinct difference between the groups that were initially being audited by NonBig4 and those that were initially audited by Big4.

The audit fee patterns also show the distinction between firms that were initially audited by a Non-Big4, and those that were initially audited by a Big4. Audit fees increased when the auditor was switched for a firm that initially had a Non-Big4 auditor (groups 00 and 01); and clearly, audit fees decreased for groups that were initially audited by a Big 4.

Figure 5 indicates that FII (foreign institutional investors) increase their ownership of firms which have switched auditors from a Non-Big 4 to a Big4. This group also exhibited an increase in assets and paid higher audit fees, although firm performance did not change much. All of this taken together suggests that firms in this group are raising new capital, and switch to a Big4 auditor to add credibility. Contrast these results with group 11 that switch from one Big 4 to another Big 4 auditor. For this group, there is a sharp decrease in profits, accompanied by a decrease in FII ownership, but audit fees also decrease. One possible reason for this behavior may be to cut costs, i.e. audit fees.

In conclusion, the evidence from the analysis presented indicates a few interesting facts that are associated with auditor switches. While the reputation story appears to be valid for firms that were initially audited by NonBig4, the cost-cutting story may be true for the Big 4 group.

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