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A NEWSLETTER OF THE FINANCE LAB

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INDIAN INSTITUTE OF MANAGEMENT CALCUTTA

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FRTL Financial Research & Trading Laboratory

Diamond Harbour Road,
Joka, Kolkata - 700104
West Bengal
033 2467 8300

Financial Research & Trading Laboratory

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Editorial

The first article tries to explore SEBI's recently issued consultation paper on 'Issuance of shares with Differential Voting Rights (DVRs) by companies registered in India. In the second piece, the author discusses cash holdings and equity mutual fund performance and concludes that cash holdings are important for mutual funds but they are extremely costly. Holding excess cash to make good deals in the event of market downturn may have adverse effects. The third article deals with financial scams in the financial world and the author concludes that the financial world has seen a bewildering range of schemes to defraud banks and investors. From the perpetrator's perspective, it is often financial engineering, and not chicanery. The fourth article discusses the impossibilities in collective choice and the author uses the classic example of elections and finds a deeper connection between market systems and voting systems. Both market and voting systems embody the collective will of its participants. The fifth article in this issue deals with Computation of Expected Credit Losses (ECLs) by Banks.

You may send your comments and feedback on this issue to ashok@iimcal.ac.in

Happy reading!

Ashok Banerjee

Shares with Differential Voting Rights

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 Securities and Exchange Board of India (SEBI) has recently issued a consultation paper on 'Issuance of shares with Differential Voting Rights (DVRs)'[1] by companies registered in India. SEBI has invited public comments on this issue. Should India follow the international practice by allowing firms to issue shares with disproportionate voting rights? Once allowed, firms will be entitled to issue shares with ownership rights different from cash flow (economic) rights. To put it simply, an investor holding a DVR may have higher control (voting) rights and lower cash flow (dividend) rights. For example, Mark Zuckerberg (with a small group of insiders) owns 18 percent of shares of Facebook (cash flow rights), but these are special types of shares (class B) which entitle the owners 10 votes per share (control rights). Such granting of disproportionate control rights to a section of the shareholders is made possible through a dual class structure. So, Facebook has issued two types (class) of common shares- one for the founders (class B) and the other (class A) for all other shareholders where each share has one vote. Google goes a step further. It has three different classes of common (equity) shares- class A (*normal class* with one vote per share), class B (*the gold class* with 10 votes per share), and class C (*the cattle class* with no voting rights). Facebook and Google are not alone in this game. A report[2] mentions that a year ago, 355 of the companies in the Russell 3000(an index which tracks the performance of the 3000 largest U.S-traded stocks) had a dual voting-class structure.

SEBI has in the past permitted listing of shares with 'inferior voting rights' but prohibited shares with 'superior voting rights'. Later in 2009, SEBI had prohibited issue of any form of DVRs. SEBI, through this consultation paper, proposes that stock exchanges should now allow issue of shares with differential voting rights. This is to bring the SEBI regulations at par with the provisions of the Companies Act, 2013 which allows every company registered in India to issue shares with DVRs. The Companies Act, 2013 provides a cap on the number of shares with DVRs that can be issued by any company to 26% of the total post-issue capital. This is not a small size- refer to the Facebook example. Incidentally, shares with DVRs cover both inferior and superior voting rights issuances. Though the amendments in the earlier Companies Act in 2000 and later the new Companies Act (2013) allowed companies to issue DVRs, only a handful of companies has actually issued DVRs. Major reason for such a poor

[1] SEBI Consultation Paper issued on March 20, 2019. Accessed from www.sebi.gov.in on March 21, 2019
[2] Www.cnbc.com/2018/03/20/shareholders-wont-force-zuckerbergs-hand-in-Facebook-management.html

show could be the heavy discount at which DVRs trade compared to the ordinary shares. For example, Tata Motors ordinary shares closed at Rs. 180.20 on March 20, 2019 when the DVR of the same company closed at Rs. 89.20- a whopping discount of 50 percent. It was not just a bad day for the DVR shares. Six months ago, the discount of Tata Motors DVRs was 52 percent.

Notwithstanding the reluctance of listed and stable companies in DVRs, the new generation high-growth early stage companies are craving for such options in raising new capital. In fact, one argues that in the absence of such an enabling provision in the capital market regulations, startups still depend to a large degree on private equity market for much-needed funds. SEBI and the stock exchanges in India have been trying since the past few years to attract startups and young companies to list in main or SME platform of the exchanges to raise risk capital. But, among many other factors, one of the major bottlenecks was dilution of ownership of the founders. Any founder of a startup does not want to significantly dilute control rights at the early stage when the firm is growing at breakneck speed. Since SEBI presently prohibits issue of shares with DVRs, the public stock market is therefore not a lucrative option for the startups. Flipkart, for example, had in the past thought of listing in Indian stock exchanges and yet decided against domestic listing. Rather it preferred strategic investment as a better alternative for the exit of existing investors.

SEBI, through this proposal, seems to address the dilution worries of the technology companies. Is it a right call, given the experience of other markets? Let us explore.

SEBI's Recommendations

Let us quickly list down the broad suggestions of the regulator in this regard. The consultation paper is quite comprehensive and the DVR group of the SEBI which was entrusted with the responsibility of preparing the note has done a thorough job. The paper covers experience and regulatory actions of other countries, academic findings, stock market performance of Indian firms which have issued DVRs, and extant provisions of various applicable laws in India.

A company can have three class of equity shares- ordinary equity shares, equity shares with fractional voting rights (FR), and equity shares with superior voting rights (SR). There can be only one type of FR and SR. SEBI, in the consultation paper, has made separate recommendations for listed and unlisted companies.

Listed firms (more than one year old since listing) can issue only FR shares and these shares cannot ordinarily be converted into ordinary equity shares. The fractional voting rights for any holder of FR shares cannot exceed 1:10 (I.e., any one holding 10FR shares will have one vote). As a compensation for inferior voting rights, FR shares may get additional dividend. The face value of FR shares is same as ordinary equity shares. FR shares can be

extinguished only though buyback by the company or reduction of capital. FR shares can be converted to ordinary equity shares only under a scheme of arrangement (i.e. M&A).

SR shares can only be issued to the promoters of a company by an unlisted company. Such an unlisted company can only issue ordinary equity shares at the time of IPO. In other words, once listed, a company is not allowed to issue SR shares. It can subsequently issue FR shares. The SR shares, after listing, can have a maximum voting ratio of 10:1 (ten votes for every SR share held). Promoters with SR shares cannot have more than 75% voting rights under any circumstances. Unlike FR shares, SR shares shall be eligible for the same dividend as ordinary equity shares. Clearly, SR shares are structured to provide promoters of a company absolute control over the company once it gets listed.

In order to ensure that owners of SR shares do not enjoy the superior voting rights perpetually and hence indulge in managerial entrenchment, the consultation paper recommends two restraining provisions:

Coat-tail Provisions: In case of certain important decisions that require shareholders approval, the SR shares (post-IPO) shall be treated as ordinary equity shares in terms of voting rights (i.e., 1:1). Such decisions include appointment/removal of an independent director and or auditor, change in the control of the company, extension of validity of SR shares beyond the initial period of five years.

Sunset Clause: SR shares will get converted into ordinary equity shares after five years of listing of the company. This privilege can be extended by a maximum of another five year term. When SR shares are finally converted, each SR share will be converted into one ordinary equity share.

SEBI has also highlighted the required changes that need to be made in several other laws in order to consider SR shares as valid financial securities. For example, the SEBI ICDR (Issue of Capital and Disclosure Requirements) regulations should be amended to allow any listed company to issue dual class shares. Similarly, the SEBI Takeover Code needs to be amended to ensure that any conversion of SR shares into ordinary equity shares do not necessitate open offer, provided there is no change in control. A challenge for SEBI would be to get the Ministry of Corporate Affairs (MCA) agree to amend the Companies (Share Capital and Debenture) Rules, 2014 in order to allow unlisted companies without profitability track record to issue DVRs.

A Critique

A basic criticism of dual class shares is it violates central principle of ‘one share one vote’ norms of corporate governance. Holding SR shares allows some group of shareholders to control boardroom decisions. Other

criticisms of dual class shares include higher management entrenchment (a matter also recognised by SEBI), large executive compensation, and value-destroying acquisitions[3].

Was there any need for SEBI to enable listing of dual class shares? Stock markets do not favour complex or non-transparent securities. In the past, companies in the West issued tracking stocks to fund acquisitions. Instead of a legal separation, tracking stock allowed issuing companies to create accounting separation of the merged/acquired entity. Stock market did not like it. Stock market reactions to dual class shares (particularly FR shares) have most of the times been negative or at best muted in many countries. Since SEBI's recommendation prohibits issue of SR shares, investors in FR shares will only be penalised with huge discount (see, the Tata Motors example). A supposedly higher amount of dividend for FR shares (compared to ordinary equity shares) would not be able to offset the market price discount. In a way even the existence of ordinary equity shares and FR shares in the market provides ordinary equity shares superior voting rights. So, consider a promoter-run listed company which issues FR shares to raise money and thus relatively ensures higher voting rights for the promoters at the cost of the FR shareholders. Therefore, even with the proposed prohibition on issue of SR shares, ordinary equity shareholders would enjoy superior voting rights.

There are several arguments in favour of dual-class structure. SR shares offer protection against proxy contests initiated by institutional or other short-term investors. Look at the recent episode in HDFC where proxy voters had almost ousted Deepak Parekh from the Board of the company. Thus, SR shares would help promoters of early-stage companies concentrate on growth without bothering much about stock market reactions. Innovative entrepreneurs, mostly in the technology-driven startups, do not favour myopic actions only to satisfy financial investors whose sole objective is to earn superior returns in the short-run. Dual-class shares provide much required immunity to the entrepreneurs in the initial years.

When a hitherto unlisted firm decides to enter stock market with IPO, the promoters' cash flow (dividend) rights would anyway be lower at that stage with venture capital and private equity firms holding majority of ordinary equity shares. Promoters would protect themselves with SR shares.

The proposed DVR regulations do not allow a listed company to issue non-voting shares (FR shares have voting rights), though the Companies Act, 2013 allows issue of non-voting shares. The consultation paper is silent on what happens to those non-voting shares when a company goes for an IPO.

[3] Vijay Govindarajan, Shivram Rajagopal, Anup Srivastava, and Luminita Enache, *Should Dual-class Shares be Banned?*. Harvard Business Review. December 03, 2018

A Possible Alternative?

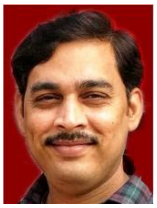
Do not advocate different status for equity shareholders. Instead of DVR shares, SEBI should promote issuance of preference shares. Startups regularly issue compulsorily convertible preference shares (CCPS) while raising money from venture capital firms. Hence, SEBI should urge MCA to prohibit issue of SR equity shares to promoters by unlisted firms. They should rather issue CCPS to non-promoter investors. The CCPS can have a conversion period of five or more years. CCPS will generally be converted into ordinary equity shares.

Similarly, instead of FR shares, SEBI should prescribe issue of non-convertible cumulative preference shares by listed firms. The advantages with preference shares are many: (a) there will be no comparison with ordinary equity shares when one looks at stock market performance of preference shares as these are two different types of shares; (b) preference shares are generally considered as bond surrogates as most of its return comes from dividend yield and hence investors in these shares would be happy with a generous and definitive dividend; (c) unlike FR shares, non-convertible preference shares will be redeemed; (d) unlike dual class shares, there will be no need for issuing additional preference shares whenever a company decides to issue bonus or rights shares; (e) issue of preference shares would protect the promoters of unlisted companies with same immunity as they would get with SR shares; (f) this enabling provision may create a market for preference shares which hardly exists in India; (g) the face value of preference shares may be delinked from that of ordinary equity shares; (h) there will be no need of restrictive provisions like coat-tail provision and sunset clause; (i) the MCA need not be persuaded to amend provisions in the Companies Rules as proposed by SEBI; and (j) the burden of dividend distribution tax will be same as with SR and FR.

The regulations for issue of preference shares already exist in the SEBI (Issue and Listing of Non-Convertible Redeemable Preference Shares) Regulations, 2013. The preference shareholders would not enjoy any voting rights and hence such instrument will protect the interests of promoters of a company from dilution of control rights till such time the CCPS get converted into equity shares. Only drawback with non-convertible preference shares (NCPS), compared to the FR shares, is the requirement of creation of Capital Redemption Reserve in accordance with the provisions of the Companies Act, 2013. NCPS are better than FR shares in three ways: (i) the issuing company will be required to set aside a part of profit (before declaring dividend) as capital redemption reserve and thus would be restrained on the amount of dividend that can be paid to ordinary equity shareholders; (ii) the finite life of NCPS would discipline the incumbent management as redemption of the paid up capital would be a contractual obligation; and (iii) the expectations of investors in preference shares are quite different from equity shareholders. Thus, there is no need for dual-class structure and there should be only one class of listed equity shares. Investors as well as the founders may be happier with this alternative.

Cash Holdings and Equity Mutual Fund Performance

Sudhakara Reddy



Dr. Sudhakara Reddy is currently assistant professor in the Finance and Control group of IIM Calcutta. He was a visiting scholar to Whitman School of Management, Syracuse University during 2011-2012. His current areas of research are Market Microstructure, Corporate finance with an emphasis on corporate governance mechanisms, Initial public Offerings and primary capital markets, etc.

Cash is a very important constituent of actively managed mutual funds. At the end of 2017, the total assets invested worldwide in actively managed open-ended mutual funds is in excess of USD 49 trillion. This is more than double of their 2008 levels. More importantly, in 2017 alone, the total net assets (TNAs) of these funds soared by about USD 9 trillion. Of this, more than USD 22.1 trillion is invested in funds operating in the United States, more than USD 17.7 trillion is invested in European Union domiciled funds and the Asia-pacific region has USD 6.5 trillion in TNAs.[4] More importantly, from March 2008 to June 2018 TNAs in Indian mutual funds have grown from INR 5.21 lakh crore to INR 23.45 lakh crore.[5] At the same time, Indian mutual funds hold 6.71 % of TNAs in cash on an average, whereas that of their US and European counterparts hold cash in the range of 3% to 3.5%. The average cash holding of top five Indian fund houses on the basis of market share is shown in Table 1. Except for ICICI Prudential AMC with a cash holding of 14.82%, all other funds have a cash holding less than 5%.

Table 1: Top 5 Indian Mutual Fund Houses and their Cash Holdings as on Dec-2018

AMC	Market Share	Equity(Cr)	Cash(Cr)	Cash Holding (%)
ICICI Prudential AMC	13.25%	61482	9110	14.82
HDFC AMC	13.10%	80744	3579	4.43
Aditya Birla Sun Life AMC	10.64%	65353	3185	4.87
Reliance Nippon Life AMC	10.28%	64327	2538	3.95
SBI Funds Management	9.96%	110003	3482	3.17

Data Source: ACE Mutual Funds, Author's own computations

However, there are some funds such as ICICI Prudential Value Fund, IDBI Focused 30 Equity fund, Tata Value Fund, etc. as shown in Table 2 have a very high cash holdings. These values are surprising as we expect that the funds in which we buy mutual fund units to invest all our money optimally in well-diversified instruments as per

[4] 2018 Investment Company Fact Book retrieved from https://www.ici.org/pdf/2018_factbook.pdf
[5] Authors own computations. Data source – ACE Mutual Funds.

the investment objectives of the fund. Cash holdings differ significantly even among the funds which are similar and compete with each other.

Table 2: 10 Mutual Fund Schemes with High Cash Holding

Scheme Name	Average Cash (INR Crore)	Average Equity (INR Crore)	Average Cash Holdings (%)
L&T Emerging Opp Fund-I-Reg(D)	54	336	17
Quant Small Cap Fund(G)	0.04	0.43	18.54
Sundaram LT Tax Adv Fund-Sr IV-Reg(G)	5	24	19
Quantum Long Term Equity Value Fund(G)	97	525	21
Tata Value Fund-Sr-2-Reg(G)	44	212	21
L&T Emerging Opp Fund-II-Reg(D)	34	172	21
Tata Multicap Fund-Reg(G)	296	1155	26
L&T Focused Equity Fund-Reg(G)	105	402	27
IDFC Equity Opportunity-5-Reg(G)	121	455	28
ICICI Pru Value Fund-19(G)	464	1490	32

Data Source: ACE Mutual Funds, Author's own computations

Mutual funds need to hold cash for various purposes. Mutual funds in the course of their investment business incur significant costs in the way of transaction costs, commissions and any other expenses in the day to day operations. Mutual funds generally have to meet the expected redemptions from investors as their one of the important motivations to put their money in mutual funds is due to the liquidity factor. Hence, holding cash helps the fund managers to overcome redemption pressure. Mutual fund managers are paid very high to manage the fund portfolio and extract maximum returns. In this process, they always look for the best deals. These deals in the stock market do last long or are not available every time. The managers have to act swiftly when there is an opportunity available and that is when cash holdings come in handy. In the times of high inflation, cash is not very attractive. However, when the markets are bearish, cash looks exciting as the mutual fund managers have the option to convert the fund securities into cash or risk-free assets such as government bonds as a precautionary measure and wish to use them to make attractive deals when the market turns bullish.

As discussed above, on the one hand cash holdings are important for mutual funds but they are extremely costly on the other hand. Lower realized returns from cash will impact the mutual fund performance. Holding excess cash to make good deals in the event of market downturn may have adverse effects. It has been documented in the academic research that managers have poor market timing skills and hence their attempts to use cash for

market timing do not produce the desired profits.[6] Given the different levels of cash holdings by various equity mutual funds in India, we examine if the level of cash holding impacts their performance. In Table 3, we report the top 5 and bottom 5 mutual funds based on performance along with their average cash holdings for the period 2014 to 2018. As seen from the table there is no clear relationship between cash holdings and performance[7]. There are funds with very high performance and less cash holdings and also low performance with high cash holdings and vice-versa.[8] Hence, from this we can understand that cash holdings may not be the only reason for a fund to perform poorly and vise-versa.

Table 3: Cash holding vs Performance of Top 5 and Bottom 5 Mutual Funds

Scheme Name	Average Cash Holding (%)	Average Return (%)
Sundaram Small Cap Fund(G)	1.78	32.17
Mirae Asset Emerging Bluechip-Reg(G)	2.95	32.37
Canara Rob Emerg Equities Fund-Reg(G)	3.12	33.82
Reliance Small Cap Fund(G)	4.88	34.37
SBI Small Cap Fund-Reg(G)	6.14	37.98
ICICI Pru Value Fund	27.09	-6.92
Union Largecap Fund-Reg(G)	4.14	-5.56
Axis Emerging Opp Fund-2-Reg(G)	5.34	-5.21
Tata India Pharma & Healthcare Fund-Reg(G)	6.41	-4.16
Sundaram TOP 100-Sr VII-Reg(G)	2.80	-3.94

Data Source: ACE Mutual Funds, Author's own computations

Based on my earlier discussion and also the numbers in the tables, we should not invest in mutual funds with more cash in bearish markets in the hope that they will show abnormal performance. On the other hand, if we don't have any view on the current as well as future stock market states, and hence invest in funds with higher cash holdings may still make the mistake of making loses. This is because we should understand that no manager can time the market consistently and if any manger or mutual fund thinks otherwise, they are miscalculating their abilities.

[6] Mikhail Simutin; Cash Holdings and Mutual Fund Performance, *Review of Finance*, Volume 18, Issue 4, 1 July 2014, Pages 1425–1464

[7] These results may show a different picture if tested statistically and hence should be read with caution.

[8] For lack of space, we do not report those details.

ALUMNI CORNER

Why cross the line on ethics in business

Balachandran R

Balachandran R is an alumnus of IIM Calcutta (1987-89) with extensive experience in corporate banking, investment banking and product management.

Financial scams are as age old as history. From simple Ponzi schemes to complex structured deals orchestrated by Enron or at an Asian sovereign fund recently, the financial world has seen a bewildering range of schemes to defraud banks and investors. From the perpetrator's perspective, it is often financial engineering, and not chicanery, though that's a moot point.

Enron case

When Andrew Fastow, ex CFO of Enron struck a deal with Federal prosecutors for a lighter sentence, he knew that it was no longer a moot point. The partnerships that were set up to hide debt from Enron's balance sheet were clearly in the realm of financial chicanery, and could no longer be considered financial engineering. Until then, he had been quite successful in convincing Wall Street investment banks and his auditors Arthur Andersen, that it was the latter case. Both paid a heavy price. The investment banks paid out billions of dollars in settlement of class action suits and with regulators, while the Big 5 accounting firms list shrunk to the Big 4.

Why Enron resorted to financial chicanery

In the heydays of the nineties, in a scenario of exuberant capital markets ('irrational exuberance' as Greenspan would say) and investor pressure on quarterly earnings growth, CEO's and CFO's were incubating deals which would generate profits from financial deals in addition to what the business generated, hide losses and suppress debt.

Enron Corporation was a classic case. The energy 'trading' business was seemingly well established and Enron was in the lime light in Wall Street. But the earnings coming in from the energy business was simply not sufficient to meet the earnings growth expectations of analysts. Losses were becoming unmanageable in some businesses and earnings proving volatile. Financial wizardry was required to keep analysts at bay in Wall Street. Fastow had

been very successful till then in keeping his vast array of bankers at tenterhooks, by making them bid one against the other. The idea of off-balance sheet entities took shape, and required the help of these bankers to execute. These entities, typified by the notorious LJM partnership, Raptor SPE et al, were created to take debt off Enron's balance sheet and to lay the basis for aggressive mark to market valuation of Enron's assets. Deals, involving complex derivatives, were struck with the partnerships, ahead of quarter ends, to be reversed immediately afterwards.

The whole structure unravelled when an employee blew the whistle, Wall Street started reflecting on the Enron stock price its nagging doubts on the Enron partnerships and Special Purpose vehicles and the consequent undercapitalization of the partnerships funded by Enron's stock. In a short period, market capitalization of USD 80 billion was wiped out, and debt of billions was rendered worthless. The pension funds of thousands of employees invested in Enron stock went down the drain.

Lessons to be learnt

Where does financial engineering cross the thin line into the shadowy realm of financial chicanery? What are the lessons for analysts, investors, auditors and investment bankers?

There are two trends that are visible here. Herd mentality was at play, with the best paid Wall Street analysts and investment bankers being no exception. Enron's financial statements had some leads to the gross inflation of earnings, in the form of fine print in the footnotes to its accounts, but the financial community largely chose to ignore it. Analysts and investment bankers chose to accept the financial statements at face value rather than suspect a corporation whose market capitalization, was among the top ten. It is always easier for everyone including the best financial brains in the world, at Wall Street, to swim with the tide, rather than against it. Often it takes a whistle blower like the little boy in the folk tale of the emperor's new clothes, to bring us back to reality.

Is white collar financial crime any different from that of petty theft or robbery? The latter's motive is usually to make two ends meet. It is a bit of an enigma on what impels those already worth millions to indulge in financial chicanery. The US based former head of the world's most prestigious consulting firm was convicted on insider trading charges. Why did a person who had reached the pinnacle of position and prestige want more? One version had it that he wanted to upgrade from the 100 million dollar net worth club to the billion dollar club.

Caesar's wife must be above suspicion

Well, in this case, the adage applies to the private sector bank CEO's husband. The banker in India, who was the darling of the financial press for several years, is suddenly facing a lynch mob from the same media, who had built up her profile for nearly a decade. The press it appears, loves to build, and then destroy, the careers and lives of celebrities. While not getting into the merits of the allegations which are still under investigation, at the very least, it appears to be a classic case of conflict of interest. An upfront disclosure followed by complete and total recusal from the deal in question would have saved the individual from the current traumatic situation and possibly much worse to come. One cannot but feel some pathos at seeing her being pilloried by the press day in and day out, when just a year back she was the most sought after representative of the financial community.

The country is now seeing an extreme case of conflict of interest. Several lakh crores of tax payers money is being used to cover up the hole in the balance sheet of banks. Where did this money go? A good part of it went to large corporates, whose promoters diverted a significant chunk of bank money into their personal coffers rather than using it for financing the projects that the bank financing was intended for. No one has paid the price for it, except the hapless public. Very few culprits have been outed and they too have fled to safe havens abroad.

While we have been unable to bring our big ticket financial criminals to justice, we have chosen to make a horrific example of a private sector bank CEO, whose alleged crimes pale in comparison to the large scale swindling of PSU banks and minority shareholders by powerful promoters.

Are Board positions sinecures?

Board positions in listed corporates can deteriorate into sinecures for retired, formerly powerful public (or private) sector executives. A supine board member beholden to the promoter/CEO for his/her position or in awe of the "professional" CEO, is unlikely to carry any accountability to the minority shareholders. When the promoter seeks the board's approval to sell off the company owned prime property to his/her own family firm at throw away prices or to invest in the promoter/CEO's related entities at inflated prices, the rare board member who asks tough questions about the related party transaction, will soon find the doors closed forever from the small clique of "independent" board members. Similarly, a credit rating agency which is truly objective in its ratings will soon find itself out of business.

Having worked in risk management in some financial institutions, the writer has experienced this. Taking a stringent view on corporate loan proposals pushed by the sales team or senior management, can be hazardous to career prospects. Many risk managers, as a result, are content to make some noise, put some innocuous remarks on record, and let the proposal pass. If the mega loan turns bad down the line, one can always point out the risks which were highlighted on record. Careers are safe, but shareholders are left in the lurch.

Another trend is the outsourcing of investigations by the Board of Directors to external parties, when faced with allegations of financial impropriety, aired in the media. This came under scathing attack by India's "doyen of corporate governance" who founded one of India's most iconic technology companies, but is no longer part of it. An agency hired by the accused, exonerates it of all blame! What credibility do such investigations carry?

A vibrant media which refuses to sweep egregious cases under the carpet, independent board members (though that's a rare breed), and strong compliance and risk management professionals at financial institutions can to some extent keep the offenders at bay. Finally, its caveat emptor, individual investors, lenders and board members who carry fiduciary responsibility to minority shareholders, should be perennially on guard against dubious investment proposals.

VOICE OF AMERICA

Impossibilities in Collective Choice

Ayan Bhattacharya

Ayan Bhattacharya is Assistant Professor of Finance at The City University of New York, Baruch College. He has a PhD from Cornell University and his research focus is financial economics, especially financial market design and asset pricing.

It is the election season in India – with all its pomp and boast – and in the US, too, candidates have begun to prime their pitch for the primary season. Millions of people will cast their individual ballots – their personal opinions on the state of affairs – and the magic of democracy will bring forth a collective will sewed from these individual choices. To an economist, elections are an example of the beauty of social choice in action. But then, so are markets! The price of any commodity, say the phone that we carry so nonchalantly in our pockets, represent the opinions of countless bidders and sellers strewn all over the supply chain – from the glass and metal manufacturers in dozens of countries, to the labor contractors that employ tens of thousands of people, to the early adopters and critics that have the power to make or break a new model. At each level of the food chain there is a bargain, and a bargain is the expression of an opinion. Markets, much like democracies, somehow collect all these scattered and discordant opinions and bind them together into a simple aggregate – the sticker price that we pay for the phone. To marvel at modern markets – or modern democracies – is to marvel at the power of social choice. Yet, surprisingly, once one burrows down to the foundation of social choice, one finds a landscape full of paradoxes and impossibilities.

1. Impossibilities in Voting

Things will quickly turn grim, so let us start our journey on a positive note with a positive result. In the middle of the last century, Kenneth May was a firebrand mathematician flitting from institution to institution – his political views had a way of putting him out of favor with authorities quickly. Today, May is best known among mathematicians for his research on the history of mathematics. To a political scientist, however, May will always be synonymous with a theorem that bears his name. In a paper published in Econometrica in 1952, May proved that in any voting system where voters had two alternatives, and all votes were treated equal, a simple majority voting was the optimal way to elicit public opinion – the conclusion known as May's theorem ever since. This

was an impressive result. A simple majority, which is how most people think of democratic opinion, was indeed the best expression of collective will according to this theorem. The catch, however, lay in the simplifying assumptions.

Elections are rarely about just two alternatives. 8251 candidates contested the polls for 543 Lok Sabha seats in India in 2014, an average of 15 candidates per seat. In a remarkable set of articles in the late 1940s and early 1950s, a young PhD student, Kenneth Arrow, demonstrated the basic paradox in systems like majority voting for multiple alternatives. Arrow was soon to become a towering figure of 20th century economic theory – and part of the reason for his legend were these early results in voting theory that opened up entire new areas of economics. The famous Arrow Impossibility Theorem, as these results are now called, tells us that every voting rule for three or more candidates is either collectively irrational, or is a dictatorship in which the election outcome is determined by the choice of a single designated selector. In other words, the options are stark: either a dictatorship, or a system where collective behavior violates the commonsense norms of rationality. Collectively irrationality, in this case, takes the form of what is popularly called "independence of irrelevant alternatives". Inspired by the work of Arrow, in the middle of the last century, Amartya Sen, along with a number of other pioneering economists clarified the meaning of this form irrationality.

Suppose you prefer vanilla ice-cream when the choice is among vanilla, chocolate, strawberry and mango. Normally, one would expect that you would continue to prefer vanilla if the choice were among just vanilla, chocolate and strawberry. In other words, your selection should be independent of alternatives that do not affect your choice directly. Roughly, this is what independence of irrelevant alternatives requires. What Arrow showed was that almost all voting procedures violated this basic axiom at the collective level. To make things concrete, suppose there were four candidates for a poll: Ram, Hari, Asha and Lata. If all the four candidates were to stand for the election, Ram would be the clear winner. However, if Lata were to somehow withdraw from the fray, the impossibility result says that Hari might beat Ram and Asha. If Ram, Hari, Asha and Lata were the ice-cream flavors mentioned earlier, this would be like saying that vanilla is your clear favorite when all the four flavors are available; however, when mango is no longer on the menu, you suddenly like chocolate more than vanilla and strawberry!

In fact, many hints of such collective irrationality in voting procedures are available in the classical works of political philosophers. Marie Jean Antoine Nicolas de Caritat, popularly known as the Marquis of Condorcet, was one of the leading figures of the French enlightenment in the late 1700s. Around 1785, he showed that collective

preference suffers from a fundamental irrationality: the existence of majority cycles. So, a majority of voters might prefer some alternative A to B, a (different) majority might prefer B to C, while a third majority might prefer C to A! Condorcet's own life saw many seemingly irrational twists and turns. He was deeply involved in the French revolution and was a key voice of moderation and reason in the frenzy that swept France in the aftermath of the revolution. In the end though, it was moderation and reason that cost him his life – as the French revolution devolved into retribution by mobs, he died escaping a rival group. A parable perhaps for the fact that one may stir a crowd through reason, but that reason may not be sufficient when the crowd becomes a mob.

The fundamental paradoxes of voting systems are brought out most starkly in another set of famous results called Gibbard-Satterthwaite theorem. Gibbard's main line of research is in philosophy and ethics, while Satterthwaite's principal contributions are in market mechanisms, but in the early 1970s, both of them arrived at the same disconcerting conclusion. In all voting systems, they asserted, people have an incentive to vote tactically to defend their opinions. In other words, people do not vote sincerely when casting their ballot; their votes are manipulable. Indian political parties seem to have a fantastic intuitive grasp of this theorem – all the talk about tactically transferring captive voter bases from one party to another is really an application of this theorem. What is important, however, is that this theorem shows that such insidious practices are not an inherent part of human nature – they are an artifact of the voting systems. A dictatorship suffers from no such issues!

2. Impossibilities in the Market

Just like voting systems, markets bring out the collective opinion of participants. And just like voting systems, markets suffer from paradoxes and impossibilities. In the early 1980s, economists Sandy Grossman and Joe Stiglitz demonstrated a fundamental contradiction at the root of the market system: a market cannot simultaneously be well-informed and well-functioning. Any trade gives away information. In any well-functioning market system, this means that the passive market participants instantaneously learn an active informed trader's information through leakage without expending any effort of their own. Thus, there is no way for an active informed trader to get compensated for information gathering in such a market. Which, in turn, implies that no market participant can have an incentive to be an active information-gatherer!

At around the same time, Paul Milgrom and Nancy Stokey, both professors at Northwestern University at the time, demonstrated another fundamental impossibility in market systems: there could be no trade in an idealized financial market. The basic idea was simple. Any trade must be preceded by a revelation of the intention to trade.

But disclosing even the intention to trade reveals some information. And it is this information that made trading impossible in idealized markets.

The Grossman Stiglitz and Milgrom Stokey results were just the tip of the iceberg; the literature on financial markets is littered with such impossibilities and paradoxes.

3. Deeper Connections?

A tantalizing question for researchers in the field is the deeper connection between market systems and voting systems. Both market and voting systems embody the collective will of its participants. But how far can one push the analogy? The parallel paradoxes and impossibilities in the two areas seem to suggest that there are fundamental links that we don't yet fully understand. Increasingly, computer scientists, too, are getting drawn to the mix. The biggest trading platforms nowadays – the Amazons and Flipkarts of the world – are run by computer scientists more than economists. Voting, too, is gradually becoming more algorithmic. In a certain sense, platforms like Facebook – with their likes and dislikes – are just giant voting machines. How does algorithmic intermediation change the fundamental questions of voting and markets? Do they enhance the interconnections between these two collective choice systems? These are exciting, open questions that new generations of researchers in economics, finance and computer science are currently grappling with.

For ordinary citizens in democracies, however, elections are about much more than such questions. For a few months every few years, we get elevated from irrelevant nobodies to pampered children – big leaders listen to us eagerly and shower us with goodies for no good reason! Much like what happens on birthdays. In a very real sense, elections are the collective birthday of ordinary citizens, and we are lucky to get to celebrate it. Even well-planned birthday parties rarely turn out to be perfect. Nevertheless, just like elections, they foster a sense of community and well-being, despite all the hiccups.

GUEST COLUMN

Computation of Expected Credit Losses (ECLs) by Banks

V K Sharma

A career central banker and a Former Member of the Markets Committee of Bank for International Settlements, Basel, Switzerland, Mr. Sharma retired as Executive Director, Reserve Bank of India (RBI), on 31st December, 2012. He is currently on the Board of Governors of International Management Institute, New Delhi and on the Academic Advisory Board of MIT World Peace University's School of Economics, Pune.

While non- bank corporate entities have been mandated to implement Indian Accounting Standards (Ind-AS for short), the Reserve Bank of India deferred its implementation by banks by one year. Among other things , the implementation of Ind-AS by banks will entail having to compute, and make provisions for, expected credit losses which, incidentally , is currently done by banks in terms of the RBI mandated Income Recognition and Asset Classification (IRAC for short) norms . These IRAC norms, as amended from time to time, require banks, to classify assets as Standard and Non-Performing Assets (NPAs for short). Based on the period of default (90 + days past due), NPAs are required to be further classified as (a) Sub-Standard, (b) Doubtful and (c) Loss Assets. Depending on the period of default, NPAs in the Doubtful category are further classified as Doubtful Category 1, 2 and 3. Again, depending on the extent to which such NPAs are secured and unsecured, the IRAC norms prescribe provisions as a percentage of the gross value of the assets which need to be made by debit to Profit and Loss Account and held to cover expected future losses on these assets. Specifically, currently substandard assets require a general provision of 15% and additional provision of 10% for the unsecured portion of the asset. Doubtful categories 1, 2, and 3 require 100% provision for the unsecured portion and 25%, 40% and 100% provisions for the secured portion. And Loss Assets need to be written off and should they need to be in the books of a bank, 100% provision needs to be made.

With the prospective implementation of In-AS by banks , it may so happen that provisions for expected credit losses (ECL for short) may be needed to be made even in the case of standard assets when none is required under the RBI's IRAC norms and equally Ind-AS required ECL provisions may be lower than those required under RBI's IRAC norms . To deal with this situation, perhaps RBI could consider a transition period during which the

Ind-AS based expected credit losses framework gets tested and validated by RBI's Annual Inspections of Banks. Until then , the RBI's IRAC based provisions may act as a floor , that is , if the provisions for expected credit losses (ECL for short) required under Ind-AS are less than those required under RBI's IRAC norms , the latter will prevail .

Having put the provision of ECLs by banks under Ind-AS in context, this paper suggests a conceptually robust and technically rigorous Formula for ECLs which can be mandated by RBI, just like the current IRAC norms, for use by banks. Such formula can be derived from Cumulative Probability of Default (PD for short) over time t , Loss Given Default over time t (LGD) , continuously compounded Risk free interest rate r , risky Interest rate y and is given by PD = { 1- e^ (r-y)t } divided by LGD , or , PD*LGD = 1- e^ (r-y)t . This formula is derived based on what is known as the principle of risk- neutral cumulative probabilities of default and no- arbitrage argument. Simply stated, what this says is that, in general, on a risk- adjusted basis, future values of two risky assets will be equal on a default probability-weighted basis. Specifically, let us consider two risky debt instruments of maturity of t years and continuously compounded annual yields of r and y with cumulative probabilities of default of PR and PD over t years and the corresponding Loss Given Default rates of Lager and LGD. In the event of default with probability of PD, the cash flow will be Recovery rate which is (1- LGD) and in the event of no default with probability of (1- PD), cash flow will be 1. So in accordance with the no-arbitrage Risk Neutrality principle, we will have:

1*e^rt*(1-PDr) + (1-LGDr)*e^rt*PDr = 1*e^yt*(1-PD) + (1-LGD)*e^yt*PD

Another way to describe this would be to say that expected future pay off from these two risky assets will be equal otherwise arbitrageurs will engage in arbitrage until the two are equal again.

But in actual practice, risky credit assets are benchmarked against comparable maturity risk free assets. If we do that, as we must, then LGDr will be 0 and PDr will be 0 and we will have a reduced form equation as under:

1*e^rt = 1*e^yt*(1-PD) + (1-LGD)*e^yt*PD

Simplifying further we have

e^(r-y)t = (1-PD)+(1-LGD)*PD = 1-PD+ PD-PD*LGD = 1-PD*LGD or

PD*LGD = 1- e^(r-y)t or

PD = { 1-e^(r-y)t}/LGD QED

The above formula can be re written to straightaway give the ECL in percentage terms as follows (Exposure at Default EAD is 1):

PD*LGD*1 = 1- e^rt*e^-yt = 1- e^-yt/e^-rt = (e^-rt - e^-yt)/e^-rt = ECL as % of EAD .

It must be noted that since the Left Hand Side is probability weighted/ adjusted Loss Given Default, there is no minus sign in the Formula as it is a measure of Loss only and duly captured as such in the derivation of the Formula! QED

To illustrate, if PD is 5% and LGD 50% (Recovery Rate 50%), then ECL as % of EAD is simply 0.05*0.5 = 0.025*100= 2.5 % which is what one also gets if credit risk spread derived from the above formula of 0.5% is multiplied by its modified duration of 5 years ,that is , 0.5%*5 = 2.5% ! In other words, the % ECL is nothing but PD* LGD which when multiplied with EAD gives the absolute ECL over time t. QED

This straightaway gives the Credit Spread as (y-r) from which y can be backed out by adding this Spread to Risk free rate r. This formula thus quantifies the credit risk spread that should be charged to a borrower corresponding to estimated PD and LGD. It is intuitively appealing to note that this spread reduces to zero if we assume Default probability and LGD to be zero! Equally, the credit risk spread widens with increase in the default probability and LGD which is also intuitively appealing.

Significantly, reverting to Risk Neutrality and No - Arbitrage arguments, a good sense of this can be had from the fact that if actual credit risk spread is wider than that computed from the above formula, then not lenders but

arbitrageurs, will short sell risk free government bond and invest the sale proceeds in the higher yielding risky debt until the formula computed and actual credit risk spreads become equal in the new equilibrium.

Modified Duration (MD for short) as calculated with Risk free rate r as the discount rate when multiplied with the Credit Spread will give the expected percentage credit loss (ECL)! QED

Here , it must be noted , y and r , are continuously compounded annual interest rates which can be derived from discretely compounded annual interest rates as ln(1+i/100) *100 both for Risk free and Risky assets . And continuously compounded interest rates can be converted back into discrete annually compounded ones by the formula e^ i/100 and deducting therefrom 1 and multiplying the result with 100!

The Annually Compounded version of the Formula is

(1+r)^t = (1+y) ^t (1-PD*LGD)

So the risky asset interest rate obtained in above paragraph based on Continuously Compounded rate as adjusted above will be exactly equal to the one obtained from the second formula !

PD can be calculated as NPAs/EAD percentage in a particular category of loan pool/ portfolio and Recovery Rate as % of recovery percentage in a particular loan pool/ portfolio and LGD as (1–Recovery Rate)

Significantly, this spread as derived above can be used to work out fair value of the commission to be charged on Bank Guarantees and Letters of Credit as being the difference between the Present Values of Risk free Government Security and the risky bond with the above credit risk spread. Or alternatively, through Modified Duration of Risk free bond multiplied with the credit spread!

All this quantification of credit risk is also referred to as Credit Value Adjustment (CVA). As above, this is nothing but the difference between the present values of Risk free asset and the Risky asset of the same maturity. Its value in percentage terms is captured by MD of risk-free asset multiplied by the Credit Risk spread of the risky asset!