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A NEWSLETTER OF THE FINANCE LAB

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Indian Institute of Management Calcutta

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# Editorial

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Artha has completed five years this month. We could continue this publication with the support of our contributors and readers. We have tried to cover insightful articles on financial markets, behaviour of market participants, corporate finance and corporate governance. We are adding a new section to mark our five years of existence- Voice of America where we would highlight recent trends in financial markets in USA from a broader perspective. Artha has evolved over the years to include separate sections for faculty, alumni and student community of IIM Calcutta.

In the first article, the author deals with the efficiency of audit market. The second piece argues the potential of AT1 bonds to wreak havoc in the global financial system from a systemic perspective. The third article explains the Credit Value Adjustment (CVA). In the fourth article, the author highlights that the board members should figure out that ‘default’ on any debt is a material event from the perspective of the shareholder. In the last piece, the author discuss about the massive growth of passive funds in Western markets in the last decade.

The *Market Watch* section in this issue highlights the Bitcoin crash after a China crackdown on crypto-currencies.

You may send your comments and feedback on this issue to [ashok@iimcal.ac.in](mailto:ashok@iimcal.ac.in)

Happy reading!

**Ashok Banerjee**

# Audit Market

## Ashok Banerjee & Leesa Mohanty\*



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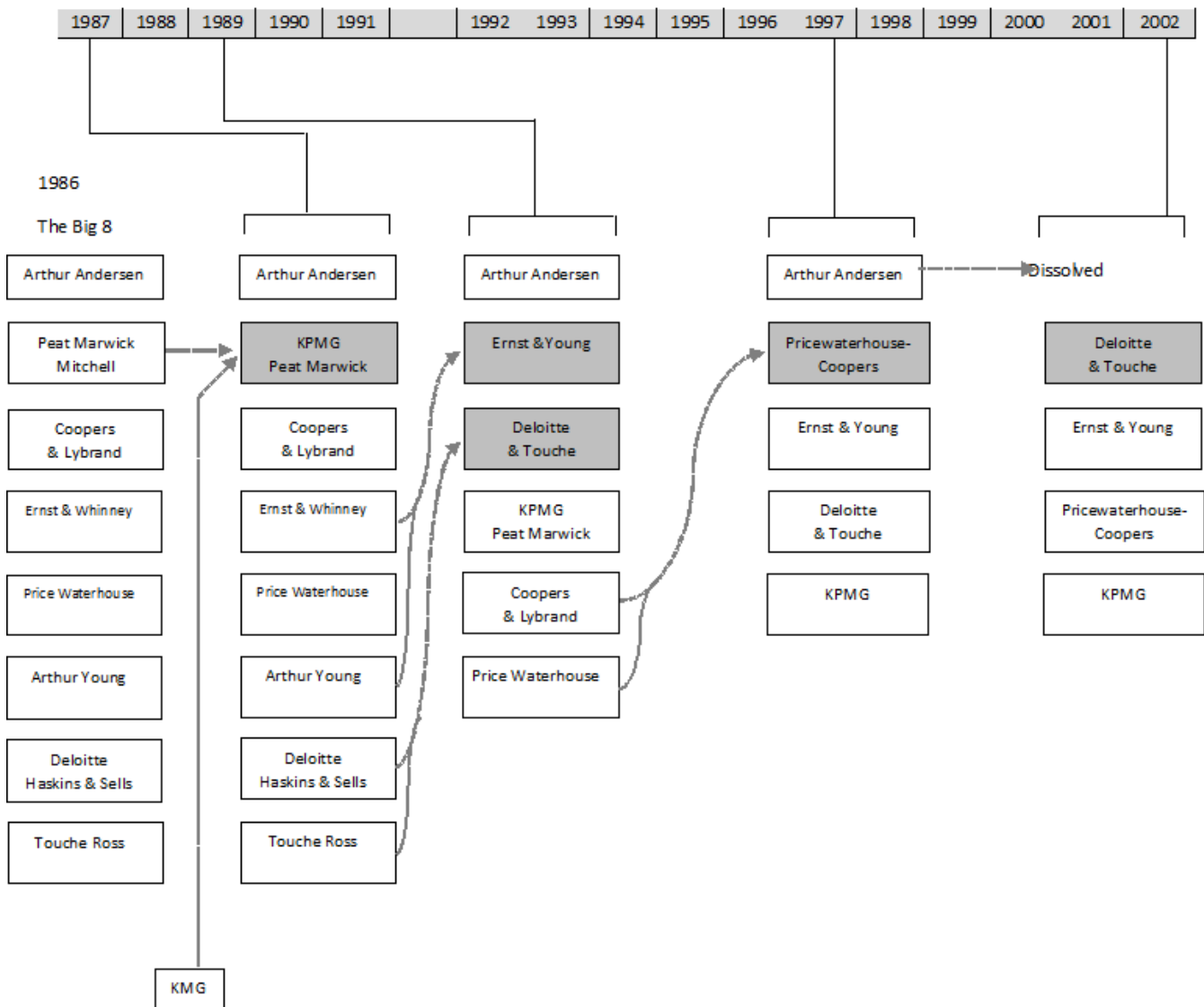
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Efficiency of any audit market is broadly measured by quality of audit. Audit quality, in turn, depends on two factors- (a) ability to identify misreporting and errors in financial statements; and (b) willingness to report such errors and/or misstatements. While the first factor relies on the skill and competence of auditors, the second one surely depends on independence of auditors. It is generally believed that large audit firms can ensure better audit quality as they employ more competent resources who have requisite auditing skill as well as knowledge of select sectors or industries. Smaller audit firms could not afford large number of efficient auditors for cost reasons. As a result, audit market internationally is dominated by the oligopoly of the so-called Big 4 audit firms (Deloitte, EY, PwC and KPMG). The evolution of audit market over the past three decades showed further concentration of the industry- from Big 8 auditors to Big 4 auditors (*see figure in next page*). Is such a level of concentration good for the audit market? Will this feature make the audit market less efficient? Answer to these questions lies in quality of audit rendered by Big 4 and other auditors. Whether Big 4 auditors provide higher audit quality is an empirical questions and evidences are mixed. Simunic and Stein (1987) suggest that having spent heavily on building their brand names, the Big 4 auditors have an incentive to protect their reputations by providing more credible financial reports. Another study (Becker et al, 1998) shows that Big 4 auditors were able to restrain audit clients from earning manipulations. Jaggi et al (2014) confirm firms audited by industry specialists reflect a better earnings quality compared to audits by non-specialists. There are counter evidences too. Lawrence et al (2011) find that the effects of Big 4 auditors on audit quality are insignificantly different from those of non-Big 4 auditors.

The second issue concerning efficiency of audit market deals with auditor independence. Auditor tenure defines the relationship between auditor and auditee. Longer auditor tenure has mixed implications. On one hand, it allows audit firms to gain deeper knowledge about the client and thus helps the auditor ensure better audit quality. Skeptics, on the other hand, point out that longer auditor tenure creates problem with entrenchment of auditor, compromising the quality of audit. Auditor independence refers to the ability of auditors to be free from persuasion, influence or bias. One popular measure of auditor independence is the size of audit fees. Proportion of audit fees to non-audit fees is also used as a proxy for auditor independence (Frankel et al. 2002). Accounting firms argue that providing consulting services to audit clients produces knowledge spillovers that increase audit

efficiency and hence questioning auditors' independence in such situation is not valid. Others observe that non-audit fees billed to audit clients are positively associated with proxies for earnings management.

Fees capture both demand and supply factors associated with audits. However, one may question that oligopolistic premium charged by Big4 auditors may not translate to better audit quality. It is believed that auditor independence can be ensured through (a) periodic rotation of auditors and (b) regulating the type of consulting services that an auditor can render for the audit client.



Source: Patrick Velte and Markus Stiglbauer, *Audit Market Concentration & Its Influence on Audit Quality*. *International Business Research*. Vol 5, No. 11, 2012.

## Audit Market in India

Audit market in India is characterized by three features- dominance of Big 4 auditor, increasing share of non-audit fee and advocacy for joint audit. Dominance of Big 4 audit firms in Indian audit market is not new. They

began to grow in the Indian market since 1991 (Desai et al., 2012). However, the Big 4 multinational audit firms are not permitted to audit accounts under their own name and therefore they formed networks with local Indian audit firms to conduct audit in India (Layak & Mehra, 2009). Table 1 shows the number of companies audited by Big 4 auditors and top non-Big 4 auditors for past three financial years. The top ten audit firms accounted for audit of 36% of listed companies in NSE during 2015-16. Within the Nifty 500 subset, the dominance of Big 4 Auditors was much higher. In financial year 2015-16, they handled a total of 234 audits (46%). The overall audit market in India is crowded with a large number of small single-location audit firms. For example, 830 audit firms audited 1519 NSE-listed companies in 2015-16 with an average volume of less than 2 auditee per auditor<sup>1</sup>.

**TABLE 1**

**Number of Company Audits**

<b><u>Auditor Name or Group<sup>2</sup></u></b>	<b><u># of Companies audited in 2015-16</u></b>	<b><u># of Companies audited in 2014-15</u></b>	<b><u># of Companies audited in 2013-14</u></b>
Big N Auditor (4 firms)	403	380	371
Non-Big N Auditor (6 firms)	157	149	137

Note: If a client has joint audit, credit has been given to each auditor

The total audit fee paid out by companies was a significant Rs. 19,000 million<sup>3</sup> during 2015-16. This was an increase of 9 per cent from the Rs. 17,460 million paid out in the previous financial year 2014-15. The average audit fee paid by 1400 NSE-listed companies was Rs. 13.7 million. Table 2 shows the breakup of audit fees and total fees for last three financial years. The average audit fee earned by Big 4 auditors was Rs. 1,197 million- which was almost 90 times of average audit fees of the industry during 2015-16. There is a huge inequality in audit fee paid by large and small cap companies. About a quarter of the fees earned by Big 4 auditors came from non-audit services. Other services for Non-Big 4 auditors constitute 10% of total fees. Therefore, non- big 4 auditors are more dependent on audit fees. Big 4 auditors in terms of business volume and fees earned dominate

<sup>1</sup> Prime Database, September 2016

<sup>2</sup> Big N Audit Groups as per Prime Database: 1. Deloitte Group (Deloitte Haskins & Sells, Deloitte Haskins & sells LLP, A F Ferguson & Co, C C Chokshi & Co, Fraser & Ross, S B Billimoria & Co) 2. EY Group (S R B C & CO LLP, S R Batliboi & Associates LLP, S R Batliboi & CO LLP, S V Ghatalia & Associates LLP) 3. Price Waterhouse Group (Price Waterhouse, Price Waterhouse & Co, Price Waterhouse & Co LLP, Bangalore, Dalal & Shah, Lovelock & Lewes) 4. KPMG Group (B S R & Associates LLP, B S R & Co LLP, B S R & Company, B S R and Associates, B S R and co, B S R and company)

<sup>3</sup> Data based on 1,389 companies for which audit fee/total fee data was available. Source: Prime Database



Indian audit market. It may be interesting to examine whether audit quality in India has improved in such a dominant audit market structure.

**TABLE 2**  
**Breakup of audit fees**

<u>Auditor Name or Group</u>	2015-16		2014-15		2013-14	
	<u>Total Fees</u>	<u>Non-Audit Fees (%)</u>	<u>Total Fees</u>	<u>Non-Audit Fees (%)</u>	<u>Total Fees</u>	<u>Non-Audit Fees (%)</u>
Big 4 Auditor	6614.8	28%	5984.2	25%	5404.1	27%
Non-Big 4 Auditor (6 firms)	2123.7	11%	1769	17%	1728.5	8%
Industry Average	13.7		12.1			

Note: The figures above are in INR Million.

Joint audit is voluntary in India. There are only 91 companies out of Nifty 500 subset practicing joint audit. Auditors in India (other than Big 4) were advocating for mandatory joint audit for large companies. However, the Government of India rejected the plea by auditors for joint audits in large companies stating that it is not a viable option for promoting domestic audit firms. Even if joint audit is mandated, it cannot be guaranteed that one small firm and one big 4 firm will handle the audit. Table 3 lists instances of voluntary joint audits of audit clients in Nifty 500 subset. About 10% of companies went for joint audit every year- these include banks and PSUs.

**TABLE 3**  
**Longitudinal distribution of firm-year observations**

Year - Fiscal	Audit Firm type			Joint Audit type	
	Big 4	Others	Total	Joint Audit	# of firm-years in this year/ total # of firm-years
2007	170	239	409	63	9.09%
2008	176	235	411	62	8.95%
2009	177	230	407	63	9.09%
2010	182	226	408	74	10.68%
2011	180	228	408	71	10.25%
2012	183	226	409	74	10.68%
2013	183	224	407	72	10.39%
2014	180	224	404	71	10.25%
2015	186	223	409	70	10.10%
2016	191	205	396	73	10.53%
<b>Total</b>	<b>1808</b>	<b>2260</b>	<b>4068</b>	<b>693</b>	<b>100%</b>

## Corporate Law and Audit Market in India

The new Indian corporate law (Companies Act 2013) seeks to address the audit quality issue from two angles- auditor rotations and prohibition in certain non-audit services to audit clients. Companies Act 2013 made rotation of auditors mandatory for listed and many unlisted companies effective from April 2017 in situations where an auditor has served in that capacity with a particular auditee for ten or more years consecutively. There is also a provision of a cooling period of five years for the audit firm with respect to the same audit client. One more important provision in this respect is about rotation of audit partner. The law states that no audit firm having a common partner(s) to the other audit firm, whose tenure has expired in a company immediately preceding the financial year, shall be appointed as auditor of the same company for a period of five years. It implies that if a signing partner of an outgoing audit firm (due to rotation) joins another audit firm, the latter audit firm will also be ineligible to be appointed as auditor of the same audit client in the immediate subsequent year. Consider an example, if Mr. X, signing partner of audit firm ABC (which has just completed ten consecutive years of audit of a client MNO) joins a rival audit firm PQR, the latter audit firm (PQR) will not be allowed to conduct audit of MNO at least for one year. However, if MNO approaches PQR after a gap of one year since ABC audited the company, PQR would have no restriction in accepting the audit client. Therefore Indian corporate law does not specifically require audit partner rotation.

**Table 4: Auditor Rotation**

<u>Year</u>	<u>Auditor Rotation</u>	<u>Audit Firm Rotation</u>
2008	126	83
2009	106	58
2010	133	87
2011	140	81
2012	135	80
2013	127	59
2014	165	87
2015	144	75
2016	131	75
<b>Average</b>	<b>134</b>	<b>76</b>

Auditor rotation was not mandatory under the earlier corporate law and yet it was in vogue in India (Table 4). Data on Nifty 500 over the past nine years show that annually 134 audit clients on average had different audit partners signing their financial statements (partner rotation). About 15% of the Nifty 500 companies had changed their auditor every year.

Auditor rotation is mandatory from the current financial year. Recent data on Indian audit market show that auditor rotation did not adversely affect volume of business of Big 4 multinational audit firms. For example, the

top two of the Big 4 auditors in India (Deloitte and EY) have bagged enough new auditees from other two Big 4 and smaller auditors to compensate for the number of clients they lost due to mandatory audit rotation<sup>4</sup>. It has also been observed that large Indian corporate chose to just swap the auditors or replace an Indian auditor with one of the multinational audit firms. Therefore, the audit swap among Big4 firms also denied opportunities to local and smaller audit firms any additional business. There is no empirical evidence to suggest that auditor rotation leads to greater independence of auditors. In fact, there is greater possibility of bad audit in first year under any new auditor due to learning curve effect.

To ensure independence of auditors, another restrictive provision in the Companies Act 2013 relates to rendering of non-audit services. Services out of the ambit of a statutory auditor include internal audit, book keeping, investment advisory services, investment banking services, and management services. The restriction is much wider- it includes not only the audit client but also its holding or subsidiary companies. The term ‘management service’ is little vague and is nowhere defined in the Act. Therefore, it is not clear which non-audit services, other than taxation services, may be assigned to an auditor. Will this restriction improve auditors’ independence? Answer is not straightforward. One obvious argument in favour of such restriction is to ensure that auditors are not dependent on corporate largesse and hence can be forthright in expressing their opinion. The ‘resource-diversion’ view suggests that expanding consulting services could undermine audit quality. There is equally strong argument against such restrictive provisions. Providing consulting services may improve audit quality- consulting staff often provide valuable insights to the audit staff because they act as ‘domain specialists’ on audit engagements.

If one puts the above two restrictive provisions – auditor rotation and prohibition of non-audit services in perspective, a natural question would be whether these provisions would have negative effect on the overall income of Big 4 audit firms. Recent data on impact of mandatory auditor rotation in India showed that there was no reduction in audit clients of Big 4 firms due to audit swap. It is quite possible, and also perfectly legal under the new corporate law, that an audit firm retains non-audit services of a client while relinquishing audit services. Thus, Big4 audit firms would only swap their audit clients for audit services and retain non-audit services of the old auditees. Therefore, the restrictive provisions of the Companies Act 2013 may prove to be windfall for Big 4 auditors in India.

The Companies Act did not make joint audit mandatory. Rather the law left it to the shareholders of a company to decide about appointment of joint auditors. In case any company decides to have joint audit, the law states that the company shall follow the rotation of auditors in such a manner that all of the joint auditors do not complete their term in the same year.

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<sup>4</sup> The Economic Times, June 14, 2017  
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## ALUMNI CORNER

# AT1 Bonds: the new Financial Weapons of Mass Destruction?

**Balachandran R**



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

Credit Default Swaps (CDS) are financial derivatives that earned the notoriety of being characterized Financial Weapons of Mass Destruction in the aftermath of the 2007-8 financial crisis, which originated in the US. CDS is a kind of insurance against credit default. It was issued by insurers like AIG and other market participants, and bought by investment banks like Goldman Sachs, to protect their investment in subprime and other securities. Speculators too can buy the contract without holding the underlying security. When the financial crisis reached its climax, AIG nearly went down the Lehman Brothers route to bankruptcy thanks to its CDS exposure. It avoided Lehman's wretched fate with the US government's rescue, but it was a close call. At its peak, the total outstanding CDS contracts in the market was estimated at more than 60 trillion dollars, bearing no correlation to the underlying value of the securities it sought to protect. An implosion in the CDS market, given its size, could have sounded the death knell of the financial markets, hence the tag Financial Weapons of Mass Destruction for these swap contracts.

Since the winding down of the crisis days, CDS no longer attracts the same level of attention, though the market for the swaps continues to be active.

### **Basel Committee Standards**

Prior to the crisis, the Basel Committee for Banking Supervision had published two accords for capital adequacy, the Basel I standards in 1988 and Basel II in 2004. Basel 1 was a simplistic approach. It painted all counterparties in a particular category with the same brush by assigning a uniform risk weightage. Emphasis was on credit risk. Basel II accord proposed a more risk sensitive approach towards capital adequacy measurement. It also introduced capital standards for operational risk and incorporated the market risk measures brought in, post the Basel I accord. The Basel II accord was an abysmal failure in addressing the systemic, liquidity, leverage and pro cyclical issues in the banking sector, which led to and exacerbated the financial crisis.

### **The Basel III Accord**

The Basel Committee, learning from these lessons, introduced several measures including a leverage ratio that sought to constrain excess leverage in the banking system, and global liquidity standards, along with a framework to promote the conservation of capital and the build-up of adequate buffers above the minimum that can be drawn down in periods of stress.

A critical lesson learnt from the crisis was the need for an additional capital layer that can absorb losses on a going concern basis.

The earlier Basel accords had elements of such capital but they could not act as an effective layer for absorbing losses for the simple reason that they were structured to do that only on a “gone concern” basis i.e. in a liquidation scenario. Depositors would have to stand in a queue and wait for liquidation of the assets of their bank to recover their investments. Such a “forced sale” usually results in lesser valuation of assets and takes time.

AT1 Bonds a.k.a Perpetuals

Basel III accord therefore introduced a new instrument, the Additional Tier 1 (AT1) bond, to protect depositors of a bank on a “going concern” basis. The essential element of this instrument is the imposition of losses on its holders without the bank being liquidated, if the Common Equity Tier 1 (CET 1) ratio falls below a threshold level. The bonds are also known as perpetuals as they do not have a specific redemption date. To qualify as an AT1 bond, 14 criteria are specified by the Basel Committee, the following being noteworthy apart from the perpetual nature:

- 1) Callable at the initiative of the issuer only after a minimum period of five years. For exercise of a call option, a bank must receive prior supervisory approval
- 2) The bank must have full discretion at all times to cancel distributions/payments of coupon/dividends
- 3) Coupon/dividends must be paid out of distributable items
- 4) Principal loss absorption through either
  - Conversion to common shares at an objective pre-specified trigger point or
  - A write-down mechanism which allocates losses to the instrument at a pre-specified trigger point.

AT1 bonds are quasi equity instruments that seek to protect depositors through the loss absorption mechanism and discretion on coupons, while leaving investors in the bonds in high risk circumstances.

Why would an investor go for AT1 Bonds?

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The answer can be summarized in a single word: yield.

Scenario in today's yield starved world:

US government 10 year Treasury	2.054 %
German 10 year Bunds	0.309%
Japanese 10 year Bonds	-0.015% (negative)
UK 10 year Gilts	0.997%

(as on 8th September 2017)

In comparison, AT1 bonds stand out, with bonds of top rated global banks offering around 5%.

Indian PSU banks yield to maturity on rupee perpetuals ranges between 8 pct and 12.5 pct. The investors in AT1 bonds are primarily institutional. Regulators generally discourage the small retail investor from this segment. It is the expectation that wholesale investors with "superior" credit risk and market risk assessment skills are better equipped to invest in such bonds.

Another perplexing factor in AT1 bonds: why would someone invest in a bond that does not ever repay its principal? The call option comes to the rescue here. Despite issuers being explicitly prohibited under the Basel standards from creating an expectation with investors that the call will be exercised, the markets expect banks to call the bonds at the end of 5 years and usually well capitalized banks oblige. Voila! A perpetual bond is now a very attractive short term instrument with a mouthwatering yield.

Are AT1 Bonds serving the purpose?

Earlier this year, Banco Popular of Spain faced mounting losses and a run on the bank by its depositors. In a deal orchestrated by the European Commission, the larger Spanish bank Santander, took over Banco Popular, while imposing a write-down on AT1 bond holders for nearly 2 billion Euros. In the rescue of the Italian bank Monte dei Paschi, 4.5 billion euros were converted into ordinary shares, though retail investors were spared.

The recent instances broadly prove that AT1 bonds are working as intended, though some central banks question if the write-downs happened at the European banks only when the banks were on the verge of becoming a "gone concern".

The experience with weak public sector banks in India offers a study in contrast. The Indian government's apparent willingness to support its subsidiary banks through additional capital to prevent an AT1 bond write-down, is perhaps a reflection of its worries of a contagion risk to the banking system and its own credibility in the traditional role of a promoter.

Moral hazard

The regulator now requires banks to provide for 50% of outstanding secured loans as soon as a defaulter is referred to the National Company Law Tribunal (NCLT) under the Insolvency and Bankruptcy Code, and 100% if the defaulter goes into liquidation. PSU banks in India, with large problem loan exposures being referred to the NCLT for resolution, would therefore require significant amounts of additional capital in the near future to meet the standards for CET 1 ratio as per the Basel III accord. This ideally should happen through the write-down of AT1 bonds, unless the government continues to step in with its own capital infusion. Apart from fiscal constraints that the government faces, such large scale bail out of institutional holders who have been enjoying high returns on account of the risky nature of AT1 bonds, will entail a moral hazard. It also goes against the very *raison d'être* of the AT1 bonds which entails holders absorbing losses. The US government bailout of Wall Street Banks during the financial crisis attracted scathing criticism that it was tantamount to private profits and socialized losses. In a developing country like India, a tax payer led bailout of institutional investors in AT1 bonds, may not be politically palatable.

The concerns around protection of the principal portion of the AT1 bonds apart, the risk of nonpayment of coupon remains. Basel standards allow coupon (interest) payment only from distributable reserves. Further loan loss provisioning by weak PSU banks could lead to reserves being wiped out and trigger a default on coupon payments. Capital infusion by the government can potentially bailout the principal portion of AT1 bonds but cannot support banks without reserves in meeting coupon payment obligations.

### **The next Financial WMD's?**

A final word on the potential of AT1 bonds to wreak havoc in the global financial system from a systemic perspective. An AT1 bond write-down for institutional holders could very well trigger a run on the bank by retail depositors who may fear that they may be next in the line to take a hit. As long as the problem is localized as observed recently in Spain and Italy, there is no risk to the broader banking system. But en masse write offs of AT1 bonds at multiple banks in the event of a scenario like the last financial crisis is a real possibility. If depositors stampede to the exits, the inter connected banking system would again be at risk as witnessed during the dark days of 2007-8.

Governments, regulators and financial market participants can perhaps take comfort from the recent statement of Janet Yellen, the Chairperson of the Board of Governors of the US Federal reserve, that she does not foresee another financial crisis in our lifetime. Let's hope that she is right! Readers may however take note that she did appear to back track on her remarks in a subsequent testimony to the US Senate.



## ALUMNI CORNER

# Credit Value Adjustment - Explained

Ritesh Chandra



*He is working as an executive vice president - risk management with Yes Bank.*

### Traditional view on OTC derivatives risk

Until 2008, OTC derivatives focussed on market risk. Counterparty risk was considered secondary. Most counterparties had strong credit rating and the possibility of default was seen as remote. While Basel-II introduced a capital charge for counterparty risk in the trading book and accounting rules introduced in 2006 required counterparty risk to be factored into balance sheet valuations, it continued to be managed at PFE (Potential Future Exposure) level.

Derivatives were valued using the concepts of risk neutral probabilities and no arbitrage. A risk neutral portfolio is expected to earn a risk-free rate and LIBOR rates were the benchmark. The “risk-neutral” or “risk free” price assumed a credit risk free world – where none of the counterparties would default and all contractual cash flows will happen

### 2008 financial crisis

A cascade of defaults in 2008 (Lehman in particular) exposed the weakness of this traditional view.

Financial institutions and regulators realized that any firm could default and that they had to put much more emphasis in understanding, managing and controlling counterparty risk.

Historically, LIBOR was viewed as the risk free rate, as it was close to AA-rated interbank loans. Post Lehman’s default, the 3-month Fed funds-LIBOR spread widened to 350bps – calling into question the use of LIBOR as benchmark rate. Subsequently, the overnight index swap (OIS) rate has become the “risk-free” rate<sup>1</sup>.

The assumption of no defaults proved to be unrealistic in the post –Lehman world. Financial institutions realized the need to adjust the risk-free price by an amount equivalent to the market price of the counterparty risk embedded in the derivative contract.

Presently, CVA (Credit or Counterparty Value Adjustment) has become very important for financial institutions and they devote substantial resources to calculate CVA in their derivative book. It has been reported that during the 2008/09 financial crisis, two-thirds of the credit related losses that banks suffered were CVA related (paper losses on the balance sheet), as opposed to actual default losses. Once counterparty risk (CVA) is priced, the bank can decide whether to monetize that risk (continue to carry that risk and expect that not too many counterparties will default) or hedge it.

### **Credit Value Adjustment (CVA)**

CVA is an adjustment to the “risk-free” value of a derivative to account for potential counterparty default.

$$P_{\text{Risky value}} = P_{\text{Risk free value}} - CVA \dots (1)$$

*P<sub>Risky value</sub> = Price of derivative after adjusting for counterparty risk*

*P<sub>Risk free value</sub> = Price of derivative without counterparty risk (OIS discounting)*

*CVA = Counterparty credit risk adjustment*

Historically, CVA was seen as a “credit charge” for pricing and a “reserve” or “provision” for financial reporting purposes<sup>2</sup>. More recently, CVA is defined as the price of hedging out the counterparty risk, irrespective of default

<sup>1</sup> For example the Fed funds rate in USD - the interest rate at which depository institutions lend balances at the Fed Reserve to other depository institutions overnight. It is considered safer than unsecured deposits (LIBOR loans) because it occurs in the Federal Reserve System under the oversight of the Fed.

<sup>2</sup> While this doesn't represent the actual loss for a trade, it's sufficient in a portfolio context assuming there are many trades across different counterparties

### **CVA formula**

$$CVA \approx -LGD \times \sum_{i=1}^m B(t_i) \times EE(t_i) \times PD(t_{i-1}, t_i) \dots (2)$$

*LGD (Loss given default) = percentage of exposure expected to be lost if the counterparty defaults*

*B(t<sub>i</sub>) = risk free discount factor at time t<sub>i</sub>. Any future losses must be discounted back to the current time*

*EE(t<sub>i</sub>) = Expected exposure for the relevant future dates, t<sub>i</sub>*

*PD(t<sub>i-1</sub>, t<sub>i</sub>) = Marginal default probability in the interval between t<sub>i-1</sub> and t<sub>i</sub>*

CVA can be expressed either as a standalone value or as a spread (per annum charge).

### Example – CVA components for a swap trade

<u>Time (years)</u>	<u>LGD</u>	<u>Discount factor</u>	<u>EE</u>	<u>Default probability</u>	<u>CVA component</u>
0.00	60%	1.000			
0.25	60%	0.995	0.44%	0.41%	0.00%
0.50	60%	0.990	0.83%	0.41%	0.00%
0.75	60%	0.985	1.18%	0.41%	0.01%
1.00	60%	0.980	1.46%	0.41%	0.01%
1.25	60%	0.975	1.69%	0.82%	0.01%
1.50	60%	0.970	1.94%	0.81%	0.02%
1.75	60%	0.966	2.16%	0.81%	0.02%
2.00	60%	0.961	2.33%	0.80%	0.02%
2.25	60%	0.956	2.43%	1.21%	0.03%
2.50	60%	0.951	2.50%	1.19%	0.03%
2.75	60%	0.946	2.50%	1.18%	0.03%
3.00	60%	0.942	2.47%	1.16%	0.03%
3.25	60%	0.937	2.31%	1.56%	0.03%
3.50	60%	0.932	2.13%	1.53%	0.03%
3.75	60%	0.928	1.91%	1.51%	0.03%
4.00	60%	0.923	1.63%	1.48%	0.02%
4.25	60%	0.919	1.29%	1.87%	0.02%
4.50	60%	0.914	0.88%	1.83%	0.02%
4.75	60%	0.909	0.46%	1.79%	0.01%
5.00	60%	0.905	0.00%	1.75%	0.00%
				<i>Total</i>	<i>0.209%</i>

While it can be computed for individual trades, what matters is the CVA of a netting set. This is important because the price of counterparty credit risk needs to mimic what will happen if a counterparty defaults. When the counterparty defaults, the Master Agreements between counterparties will legally put together trades that can be netted off for the liquidation of the portfolio and drive the subsequent payments to and from the defaulted firm. An individual trade should be evaluated only in terms of its contribution to the overall CVA of the netting set.

## Debt Value Adjustment (DVA) and Bilateral CVA (BCVA)

CVA assumes that the counterparty making the calculation will not default. International accounting standards allow an institution to consider its own default, while valuing its liabilities. Accordingly, the liability component of credit exposure (negative exposure) can be included in the pricing of counterparty risk, as debt value adjustment (DVA)

Bilateral CVA means that an institution will consider its own default, while computing CVA. In the bilateral model, the adjustment to the risk-free value of a derivative is given by

$BCVA = CVA + DVA \dots (3)$  where CVA is a cost and DVA is a benefit

### Accounting for CVA and DVA

Derivative Asset	USD MM
Risk free value	200
Counterparty risk adjustment	(25)
Fair value of derivative asset	175

Derivative Liability	USD MM
Risk free value	200
Debt value adjustment (own default)	(15)
Fair value of liability	185

### Counterparty credit improves

Increase in fair value of derivative asset on balance sheet and a gain in the income statement

### Counterparty credit deteriorates

Decrease in fair value of derivative asset on balance sheet and additional CVA charge (loss) in income statement

### Own credit improves

Increase in fair value of liability on balance sheet and a loss in the income statement

### Own credit deteriorates

Decrease in fair value of derivative liability on balance sheet and additional DVA credit (gain) in income statement

### Data challenges

Obtaining the necessary market data is a common challenge in CVA computation, especially the default probability and expected exposure components.

CVA computation requires risk neutral probabilities of default. IFRS 13 requires entities to make maximum use of market-observable credit information. CDS spreads may provide a good indication of the market's perception of counterparty's creditworthiness. However, many counterparties are "illiquid credits" with no direct market observable measure of creditworthiness. There is a significant subjectivity in obtaining default probabilities for illiquid credits. An even more difficult task is estimating correlations, between market risk factors and credit spreads. These correlations are important in order to be able to model wrong way risk

Exposure quantification is quite difficult over long horizons given the increasing uncertainty about market variables

### **Regulation and Capital requirements**

Basel III rules were introduced in 2009 to strengthen bank capital bases and introduce new requirements on liquidity and leverage. A large portion of the Basel III changes relate to counterparty credit risk and CVA

A capital charge was introduced for CVA volatility (CVA VaR), in addition to the existing charges against counterparty credit risk. This has arisen because a large proportion of the counterparty credit risk related losses in the financial crisis were seen as being mark-to-market based (CVA) rather than due to actual defaults, which were the focus of the Basel II regulations. This had some unintended consequences.

The regulatory focus on CVA seemed to encourage active hedging of counterparty risk so as to obtain capital relief. However, the CDS transactions that were most important for such hedging (single-name and index OTC instruments) introduced their own form of counterparty risk, in particular the wrong way type. The CDS market is even more concentrated than the overall OTC market and has become less, rather than more, liquid in recent years. Since it was the new CVA capital charge that was partially driving the buying of CDS protection that in turn was apparently artificially inflating CDS prices, the methodology for the additional capital charges for counterparty risk has been questioned.

*GUEST COLUMN*

# How Board Members of Defaulted companies Oversaw Shareholder Value Erosion

**Deep N Mukherjee**



Deep N Mukherjee is currently Chief Product Officer, handling product design and analytics in a Indian credit bureau. He has over 14 years of experience in Risk Management and Credit Assessment. Prior to his current role, within Fitch he was in structured finance team. Prior to his organization he was with American Express where he was heading the Institutional Risk Management Team focusing on quantitative risk management. He is also a visiting faculty in finance with IIM Calcutta. He has done his graduation in engineering from IIT, Kharagpur (BTech, 1999) and has obtained his management degree from IIM Lucknow (PGDM 2002).

SEBI redeemed itself on 4<sup>th</sup> August, 2017. This it did by issuing a circular which mandated listed companies to report ‘default’ in servicing bank loan, within 24 hours of the default. The circular which will become effective on 1<sup>st</sup> October 2017, a day before Gandhi Jayanti, would go a long way in enhancing the level, quality and urgency in disclosures to investors in Indian markets. As such, the markets have to make do with much inferior quality corporate disclosure than is the case in more developed markets. The circular unambiguously defines default as ‘non-payment of interest or principal amount in full on the pre-agreed date’. That the globally accepted definition of default would come from market regulator, and not the banking regulator, is a thought provoking matter in itself.

This mandate from SEBI will go a long way in reducing the likelihood of another corporate credit blow-up, on the lines India is currently experiencing. However, this had come in 2011, it might have prevented at least INR 4 lakh crore shareholder value erosion which happened in the following six years. While SEBI may have redeemed itself the same cannot be said about the Board Members of NPA companies. The Board particularly the independent member, of over 500 listed and defaulted companies, have still to answer to their shareholders whether they have been doing their job at all or not.

Board members, particularly independent members, usually are experienced individuals with expertise in fields such as accounting, legal, banking, economics or business. Most of them are expected to know that in the event of a payment default the company’s equity value technically becomes negligible, if not zero. The debt holders have economic and legal claim (in most countries and now also in India) to the assets of such a defaulted company thereby causing the equity holders’ stake ie; stock price to crash. As the information of default ‘leaks’ out into the market the share price nose-dives. From the time a company moves to an NPA or acknowledged default state typically stock price erodes by 95% to 99% of pre-default peak price.

The board member had ample opportunities and examples from Indian markets about stock price crash of defaulted companies. Thus they can clearly figure out the supreme importance of information about delinquency status of the company and how valuable the information is to minority shareholder. It is not too much to expect that board members may have figured out that ‘default’ on any debt is a material event from the perspective of the shareholder. Now that SEBI has issued the circular and expect compliance from 1<sup>st</sup> October 2017, we still do not see companies under the aegis of their board members proactively reporting to exchange about their delinquency status. Of course it may be a case that none of the companies in India are currently in stage of unacknowledged default, but given the economic situation this appears less likely.

### **Are Board Members of NPA Companies Negligent?**

Indian regulators, thus far, have been behind the curve in terms of creation of rules which reduce information asymmetry with respect to investors and minority shareholders of the company. It may not have been so much an intent issue but possibly a lack of appreciation of the importance of ‘default’ information to shareholders.

In the original Listing Obligation and Disclosure Requirement (LODR), a listed company was expected to share information about material events ranging from disruptions of operations due to calamity, commencement of commercial productions, litigation, organisational restructuring, issuance or forfeiture of shares, non-payment of dividend and the like. These are clearly material events but it is arguable whether any of them can erode shareholder value by 95% to 99% the way a corporate default does. To be fair to the board members of defaulted companies the fact that any default on financial obligation is a material event for the company has not been on top of mind of both the market regulator as well as the banking regulator prior to 2015.

In the earliest versions of LODR, reference to default of payment on financial obligations was absent. Gradually, non-payment of dividends was introduced as an event requiring disclosures, subsequently default on redemption of hybrid instruments such as foreign currency convertible bonds (FCCB) was identified as an event requiring disclosures and more recent inclusion was default on listed debt instrument such as Non-Convertible Debenture (NCD). Strangely, a time period was not specified other than the requirement that the news is to be shared with the exchange ‘promptly’. Even when such defaults happened it was more often via a news leak that investors got information about default events and only thereafter would the company inform the exchange.

But then the original version of listing agreement did contain a clause which read “The company *should ensure timely and accurate disclosure on all material matters including the financial situation, performance, ownership, and governance of the company*”. That none of the independent directors, pushed a company to proactively disclose event of default on any debt obligation may be a comment on the maturity of all market participants which include regulators, institutional investors, retail investors, market commentators and of course the Board Members. The 4<sup>th</sup> August 2017 regulation of SEBI possibly underscores the fact that unless pushed, the market

forces by themselves may not push most Indian companies, in general, to adopt world class disclosure norms and governance practises.

### **Did the Management and Board Neglect the September Wakeup Call?**

On September 2015, SEBI enhanced the LODR to provide further regulatory clarity on the responsibilities of the Board and Key Management Personnel (KMP) with respect to disclosure of information to the exchanges. An argument can be made that Board Members and KMPs of defaulted companies may not have been complying with this regulation in spirit and possibly also in letter, when they did not share the information of a default/delinquency event to the exchange. Let's get into the details of this argument by focussing on responsibilities of the board members, interpretation of materiality and access to information.

The enhanced LODR specifically articulated the responsibilities of the board . The prominent ones are the following:

- The board of directors and senior management shall conduct themselves so as to meet the expectations of operational transparency of stakeholders while at the same time maintaining confidentiality of information in order to foster a culture of good decision-making.*
- Ensuring the integrity of the listed entity's accounting and financial reporting systems, including the independent audit, and that appropriate systems of control are in place, in particular, systems for risk management, financial and operational control, and compliance with the law and relevant standards.*
- *Overseeing the process of disclosure and communications.*

Here one may argue that not disclosing event of default due to non-payment of bank loans does not speak highly of operational transparency and reflects poorly on integrity of reporting system with respect to risk management and financial control.

Arguably, there was a enough clear guidance in the September 2015 regulation which may have prompted a prudent board to report a default in payment of bank loan to the exchange. Further there was an a more overarching requirement which requires “*Every listed entity shall make disclosures of any events or information which, in the opinion of the board of directors of the listed company, is material.*” Further the regulator provided guidance for determination of materiality of events/information.

Two points that highlight what may constitute a material event:



(a) the omission of an event or information, which is likely to result in discontinuity or alteration of event or information already available publicly

(b) the omission of an event or information is likely to result in significant market reaction if the said omission came to light at a later date;

The company management and the board members clearly know that information on ‘event of default’ on financial obligations always cause quite violent market reactions leading to sharp correction in the stock price. It beats conventional logic on why the board members refused to identify non-payment of bank loans as a material event requiring disclosure to stock exchange.

Of course, some may point out that the Board Members may not have access to information on whether the company was defaulting on payment of bank loans. Here it may be mentioned that among the mandatory list of minimum information that is supposed to be placed before the board of directors, the disclosure on “*any material default in financial obligations to and by the listed entity, or substantial non-payment for goods sold by the listed entity*” is loud and clear.

So if the management is not placing the default information to the board, the KMP is violating the LODR.

### **Selective Bouts of Investor Activism Does Not Help**

It is a surprise that despite Company’s Act 2013 allowing for filing of class action suits by the shareholders none of the present NPA companies or their boards has been sued for negligence in duty or non-disclosure of material information such as those related to default which caused shareholders to lose massive wealth in stock market. Clearly institutional investors, corporate governance firms as well as informed individual investors have missed to highlight this massive and widespread lapse of corporate governance. As such, in most instances, Indian investing community wakes up to only those instances of corporate governance violations where the violations are disclosed by disgruntled promoters themselves! It is surprising that while everything from policy paralysis, to bank’s over lending to corporates, to global commodity price moderation, has been blamed for the Indian credit blow-up, this significant lapse in duty of the Board members of such defaulted company has not been highlighted.

**VOICE OF AMERICA**

# The Rise of the Passive Brigade

**Ayan Bhattacharya**



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At the heart of modern finance lies hidden a carefully concealed dichotomy. For financial markets to function well, prices must reflect fundamental information. Yet, it is precisely when markets are functioning well that incentives to gather information completely disappear! No recent phenomenon exemplifies this paradox better than the massive growth of passive funds in Western markets in the last decade. While the financial powers that be have remained fixated with quantitative easing and anaemic economic growth, the charm of passive investment has cast its spell on markets quietly, almost unnoticed at first. Yet the growth of the passive brigade represents a fundamental shift in the practice of finance, as big as any we've seen in the past, creating new challenges for regulators, market participants and academics alike.

## 1. Explosion in Passive Investment

As of July 2017, more than a third of all assets in the US were in passive funds, and close to \$500bn had moved out of active funds into passive funds in the first half of the year.<sup>1</sup> In fact, according to Broadridge Financial Solutions Inc., a financial technology provider, 85% of the net new asset flows through third-party channels in 2016 went into index funds or passive exchange traded funds (ETFs) in the US.<sup>2</sup> In contrast, a decade back, only about a fifth of US assets were in passive funds. In 2000, the fraction was about a tenth. The direction of net flow, as recently as 2010, was from passive to active funds. Meanwhile, the size of US stock mutual funds following passive strategies has tripled since 2007.<sup>3</sup> And ETFs, non-existent 25 years back, today account for 30% of all US trading by value, and 23% by share volume.<sup>4</sup> Though the curve has been less steep, passive investment has been growing quickly in the Europe as well. Passive strategies constituted about 12% of assets under management in 2016 in Europe, up from just 5% in 2004.<sup>5</sup>

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<sup>1</sup> Charles Stein. "Active vs. Passive Investing." bloomberg.com, July 06, 2017. Accessed: August 21, 2017.

An accompanying trend has been the relative underperformance of active funds. SPIVA, an S&P Dow Jones affiliate, estimates that about 83% of active US equity funds failed to beat their 10 year benchmark in 2016, and close to 40% of the active funds were terminated in less than 10 years due to underperformance. For Europe the numbers were about 87% underperformance and 50% terminated.<sup>6</sup>

## 2. Some Finance Theory

Building on prior work, American economists Sandy Grossman and Joe Stiglitz uncovered a puzzling contradiction at the root of finance in 1980.<sup>7</sup> Called the Grossman-Stiglitz paradox in honour of the authors, the basic formulation is deceptively simple: A financial market cannot simultaneously be well-informed and well-functioning.

A financial market can be said to function well, Grossman and Stiglitz contended, when the price at which a trade happens reflects the fundamental value of the claim being traded. The process by which a market comes up with this price of trade is called “price discovery”. Till the publication of their paper, price discovery was largely ignored in the literature, the common assumption being that markets inherently somehow always came up with the right price! They, however, wanted to lay bare the price discovery process. While wrestling with the notion of price discovery, they quickly realized that the process cannot happen in a vacuum. For a price to be discovered, some market participants needed to “actively” gather information about the claim. It is only through the participation of such informed traders in the market, they argued, can price be truly discovered. There was still a catch, however. Why must any market participant actively gather information at all? Information gathering required money and time, and a market participant would engage in the activity, they claimed, only if he was compensated for it by the market process. Could markets reward active information gatherers consistently?

Any trader will vouch for the fact that the process of trading leaks information. To see why, imagine that you need to buy vegetables, but have no clue about the prices. You come to a vegetable market completely ignorant, and begin bargaining with the sellers. If you are smart, soon enough you end up with a very good idea of the prevailing price. In effect, the vegetable sellers convey their information to you through the market process without you explicitly asking for it. This phenomenon is called “information leakage”. Going back to the Grossman Stiglitz scenario, an active informed trader, to get rewarded for the information gathering effort, must be able trade on his information advantage.

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<sup>2</sup> Valentina Kirilova. “Broadridge: The usage of ETFs and index funds hits all-time highs in 2016.” LeapRate.com, January 26, 2017. Accessed: August 21, 2017.

<sup>3</sup> Tom Petruno. “Small investors' move to 'passive' stock funds becomes a stampede.” Latimes.com, April 9, 2017. Accessed: August 21, 2017.

<sup>4</sup> Robin Wigglesworth. “ETFs are eating the US stock market.” Ft.com, January 24, 2017. Accessed: August 21, 2017.

However, as just explained, any trade gives away information. If a financial market has no frictions (in other words, well-functioning), this means that the “passive” market participants instantaneously learn the active informed trader’s information through leakage, without expending any gathering 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 would be an active information-gatherer in the first place. Which, in turn, implies that a well-functioning frictionless market will always stay ignorant!

Grossman and Stiglitz’s work created an entire new sub-field of financial economics exploring market frictions – in reality, markets do reflect information, at least partially, so researchers began to look for frictions that prevent markets from functioning well. Grossman went on to win the Bates Clark medal, and Stiglitz, the Nobel memorial prize for this and other work.

### 3. Connecting the Dots

If there is one defining characteristic of the trajectory of financial markets in the West, it is relentless drive for market efficiency. In the last two decades, insider trading has been eliminated almost entirely; information disclosure norms have been largely standardized; trading venues have been progressively made transparent; the clearing and settlement cycle has been increasingly shortened; most trading has been made electronic; the list goes on. The advent of high frequency algorithmic trading has meant that execution is almost instantaneous. The net result of all these developments has been truly well-functioning markets, especially in equities – markets where frictions have been largely eliminated.

By the Grossman and Stiglitz argument, this relentless drive towards efficiency should also imply that it becomes progressively harder to make money through active investment strategies. And that is largely what we have been witnessing in the last few years. Two thirds in active strategies might mean that US markets are still some distance away from the “perfectly” functioning ideal, but we are hurtling towards that goal at an ever increasing pace. A recent Moody’s report suggests in four to seven years, passive investing will overtake active in the US.<sup>8</sup>

### 4. The Challenges

The Grossman and Stiglitz argument that seems to be playing out in Western financial markets presents a number of challenges for regulators, market participants and academic researchers. We understand that completely

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<sup>5</sup>Jake Moeller. “Monday Morning Memo: Active and Passive Fund Flows in Europe.” [lipperalpha.financial.thomsonreuters.com](http://lipperalpha.financial.thomsonreuters.com), March 6, 2017. Accessed: August 21, 2017.

<sup>6</sup>SPIVA, S&P Indices Versus Active. [us.spindices.com/spiva](http://us.spindices.com/spiva). Accessed: August 21, 2017.

<sup>7</sup>Grossman and Stiglitz (1980). “On the Impossibility of Informationally Efficient Markets”. *American Economic Review* (70): 393–408.

<sup>8</sup>Moody’s. “Passive investing to overtake active in just four to seven years in US; global traction to pick up.” [www.moody.com/research](http://www.moody.com/research), February 02, 2017. Accessed: August 21, 2017

frictionless markets may be incompatible with high quality price-discovery. However, what is the ideal mix of these two ingredients? Do markets have a self-correcting mechanism that leads to this ideal mix, or will it require some form of regulatory intervention? At what level of passive fund flow must an investor shift his money from active to passive? Must active managers continuously readjust their fee, taking into account the level of terms of their effect on price discovery?

Another set of challenges arises from the fact that the squeeze on active strategies has meant that traditionally passive investment vehicles have been witnessing some degree of price discovery in recent years. For instance, a growing body of research shows that, when left with limited alternative opportunities, informed traders may invest in ETFs. Price discovery in such traditionally passive baskets can have a disruptive effect on the market price of the constituents.<sup>9</sup> Passive fund flow also has a tendency to inflate pre-existing market bubbles, because most benchmarks are weighted by capitalization.

For Indian financial markets, the message from this unfolding saga seems to be mixed. The limited quantum of fund flow into passive investment strategies suggests that despite regulatory efforts, Indian markets are still saddled with numerous frictions and inefficiencies. However, this also presents an opportunity – for India still has the chance to pick and choose her own trajectory on the road to market efficiency. What Indian regulators need to do at the present juncture is invest in market design research. An in-house pool of market design expertise can help Indian regulators navigate the tricky waters of market efficiency with dexterity.

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<sup>9</sup>Bhattacharya and O'Hara (2017). "Can ETFs Increase Market Fragility? Effect of Information Linkages in ETF Markets." SSRN Working Paper.

**MARKET WATCH****Bitcoin Tailspin; Chinese Cryptocurrency Ban**

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Bitcoin Price in INR (Last 1M)

*Source: Zebpay*

The Bitcoin went on a tailspin in India, falling 33% in less than two weeks, after a China crackdown on cryptocurrencies and a public remark by an RBI official, criticising the digital currency. BTCChina, one of the biggest Bitcoin exchanges in the world announced on Thursday that all bitcoin trading activities on its platform would be shut down from 30<sup>th</sup> September and has also stopped registration of new users. JPMorgan Chase CEO slammed bitcoin saying that it will ultimately blow up and said he would fire anyone trading bitcoin because it was plain 'stupid'. Global decline, fuelled by RBI's comment that it was not comfortable with non-fiat cryptocurrencies led to the sharp fall in India.

Is it a temporary crash or an end of digital cryptocurrencies with countries like China banning it and India being against it for a while? The answer remains to be seen.