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INDIAN INSTITUTE OF MANAGEMENT CALCUTTA

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Editorial

I am glad to share that a₹tha is now a peer-reviewed e-journal and will be published three times a year in April, August, and December. The current April 2022 issue has six interesting articles contributed by a₹tha editorial board members, IIM Calcutta alumni, industry experts, academics, and doctoral students.

The *first* article is about SPACs. It explains how they work, analyzes the performance of various actors and the potential for collusion, and makes policy recommendations. The *second* article discusses how information asymmetry affects capital markets and how different types of capital market regulations (for example, Clause 49) affect information asymmetry. The *third* article deals with the climate action of the Indian steel manufacturers and posits that the steel industry must grow in an environment-friendly manner. The author also discusses the stock market reaction following the COP26 Summit in Glasgow and suggests ways for Indian Steel manufacturers to achieve their greenhouse gas emissions targets in the future. The *fourth* article is about the swing pricing of debt mutual funds. It discusses why we need swing pricing, how it works in different contexts, and how the difficulties faced with implementing swing pricing regulation could be addressed. The *fifth* article is on Robo advisors. It describes how they have emerged, what services they provide, and how the emergence of technology will affect Robo advisory services in the future. The last article is about regulatory sandboxes in the FinTech sector and their adoption across countries. I hope that you find these articles insightful and share your feedback.

The next issue to be published in August 2022 will be the 10th-anniversary issue. If you would like to contribute to the 10th-anniversary issue, I invite you to submit your article to artha@iimcal.ac.in by June 1, 2022, for our consideration.

May you have a joyful and prosperous financial year 2022-23!

Sudhir S. Jaiswall

Chief Editor

Contributors

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SPAC: Winners, Losers, Robbers?

Arvind Ashta
Dinos Constantinou

1. Introduction

When private firms want to increase liquidity for their shareholders, they list in public stock exchanges. If they do not want to raise equity, they could do a direct listing, like Spotify, Slack, and Coinbase Global did in the last few years. However, if they do want to raise equity capital at the same time, they may opt for an Initial Public Offering (IPO) or merge with a Special Purpose Acquisition Company (SPAC). The usual route has been through IPOs, but ever since COVID started, there has been an increased interest in SPACs. In this article, we explain SPACs to the uninitiated before analyzing the actors' performance and indicating, by a simple financial model, the potential for collusion.

SPACs were created to prevent firms from merging with shell companies with hidden liabilities. Therefore the regulator allowed investors to create new companies with no hidden liabilities. SPACs raise money in an IPO and then hunt for a private operating business to acquire. Therefore, the SPAC is a public company registered on some stock exchanges. A SPAC is a blank-cheque vehicle, i.e., people who put their money in a SPAC do not know what the sponsors who initiated the SPAC will buy. Thus, there needs to be a lot of trust in the sponsor for retail investors to place their money. Often, Sponsors are financial market experts used to conducting deals or alternative investment managers such as hedge funds (Berger 2008). The sponsoring team may also include celebrities whom the public knows, such as Jennifer Lopez and Alex Rodriguez (Kruppa & Aliaj, 2021). SPACs led by able managers may succeed better than those just trying to make a quick buck (Sagayam and Shanks 2008).

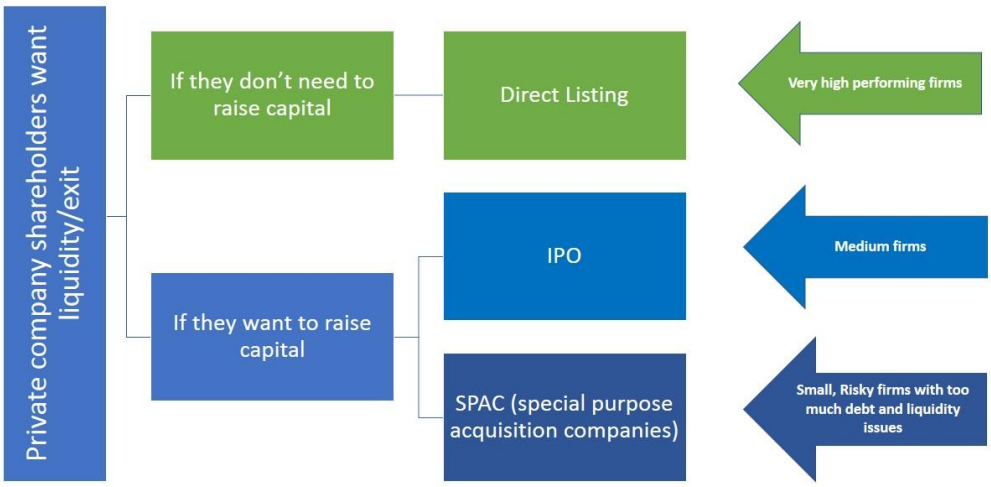
The SPAC starts with its own IPO. However, this IPO is quick and straightforward since very little due diligence is required (Matlin 2006). The money obtained by the SPAC is placed in a trust or escrow account and invested in government securities till a merger is found (Maiden 2006). The second step is to find a private firm to merge with. Once the SPAC finds a suitable target, it proposes to merge the SPAC with the private company. A regulatory body must approve this merger. The merger is also known as a de-SPAC. If the SPAC cannot acquire a suitable target, representing at least 80% of the proceeds, within a specified period (usually, eighteen months to two years in the USA), it must return the money to the investors at par value with interest (Maiden 2006). The percentage of proceeds that need to be invested and the time allowed to complete a merger may differ from country to country. For example, in Malaysia, it is 75% and three years, respectively (Chin 2009). In the

Netherlands, there is an additional requirement that if the SPAC shareholders are allotted more than 30% of the shares in the target firm, they have to make a public bid for the rest of the shares (Sachse and Cuperus 2010).

Investors could also ask for their money to be returned at any time before the merger if they wish. This creates a risk for the sponsors, who start the SPAC and have used their money to pay for the legal formalities. Sponsors usually take discounted shares in the SPAC or warrants on SPAC shares to offset this risk. As an example, a sponsor of a SPAC could take 20% of the SPAC's shares (worth $ 50 million) by paying only $10 million. Warrants are call options issued by the firm (in this case, the SPAC) rather than by a trader. Evidently, the sponsors will make higher returns than the retail investors.

If the target firm wants to raise more capital than the SPAC has, it may also seek wealthy or institutional investors to place their money. This placement is termed private investment in public equity (PIPE). PIPEs accompany more than 60% of SPAC mergers. The PIPE investment is also helpful if the shareholders of the SPAC decide to redeem their shares, thus reducing the capital available with the SPAC (Pinedo and Brown 2021). Private firms prefer merging with a SPAC instead of conducting their own IPO because mergers are completed faster than an IPO and are usually less expensive (Matlin 2006). However, in some regulated industries (such as utilities), mergers take a long time to be accepted by the approving authority, and so such industries do not seek SPACs (Matlin 2006). Companies that consider merging with SPACs often require a significant recapitalization because they are over-indebted, operate in a niche sector, or have no strategic buyers because they are already too concentrated in the market (Berger 2008). The SPAC target firms are smaller than those making an IPO, have less liquidity, and have fewer growth opportunities (Datar, Emm, and Ince 2012). The operational performance of SPAC firms is generally inferior to those that make an IPO (Datar, Emm, and Ince 2012). Figure 1 captures the major elements in choosing between direct listing, IPOs, and SPACs.

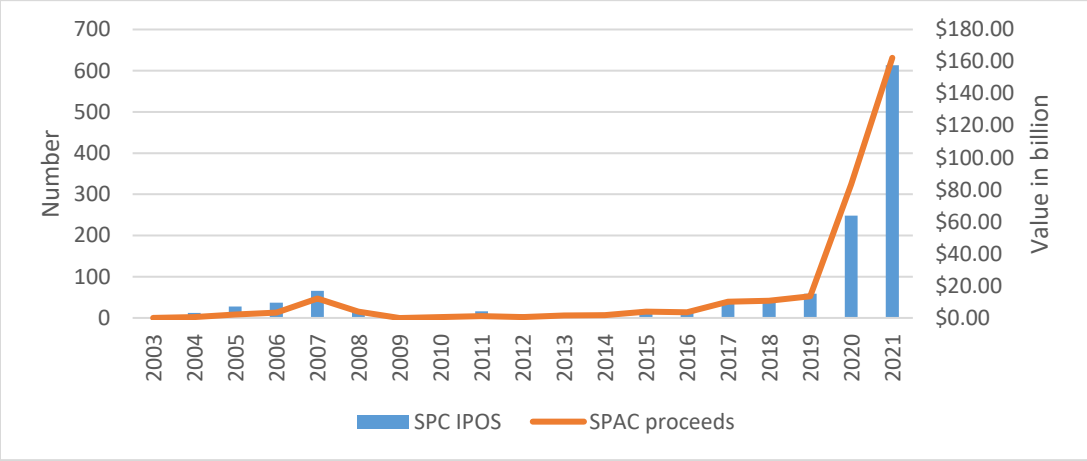
Figure 1: Three usual ways of making stock public



2. Synthesis of Recent News

As shown in figure 2, SPACs have boomed in the COVID period both in the number of SPACs and the total value collected. In 2021, 613 SPAC-IPOs constituted 63% of all IPOs in the USA. The value collected from SPAC-IPOs was $162 billion, i.e., 49% of all IPOs. The average SPAC size, i.e., capital raised in the IPO, has remained about $250 million during the last six years. This figure is not very different from the size in 2008 (Berger 2008), but the average SPAC size has been less than $100 billion in the years in between. In the last two years, some outstandingly large SPACs have raised over a billion dollars, such as Lucid Group ($2.07 billion), Ginkgo Bioworks Holdings, Inc. ($1.72 billion), and Alight, Inc. ($1.03 billion) (Patel 2021). Nevertheless, the average size of a non-SPAC IPO remains significantly larger than that of a SPAC IPO.

Figure 2: The number and value of SPACs in the United States.



Source: Based on data from spacanalytics.com downloaded on 19/01/2022.

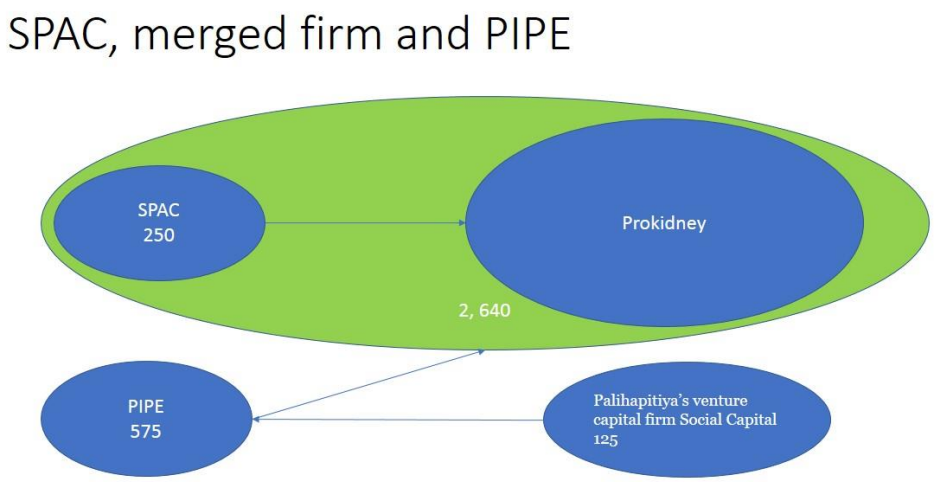
Much of the boom, notably in late 2020 and early 2021, may have arisen from enormous savings generated by generous COVID-related handouts to unemployed people who then had the time and money to try our risky ways to make their money grow. This speculative interest has led to very high values of financial markets, which are now subsiding.

Most news items on SPACs provide a few summary details such as the value of the SPAC, the PIPE investment accompanying it, and the value of the proposed merger deal. For example, a recent news item discusses the merger deal between Social Capital Suvretta III SPAC and ProKidney, a therapeutics company. It indicates that the SPAC would provide $250 million, PIPE investments would provide $575 million, and the value of the merged firm would be about $2.64bn (Asgari 2022). Thus, the SPAC shareholders would own less than 10% of the value of the merged firm. The PIPE investors may oblige the sponsor to place some of its money in the PIPE fund, as shown in Figure 3.

Even a large fund such as Softbank creates SPACs of about the same size. For example, its SVF SPAC raised $320 million and will participate in a merger with Symbiotic, an artificial intelligence company. PIPE investors, including Walmart that uses Symbiotic's technology, would provide $205 million. The deal offers an enterprise value of $4.8 billion (Asgari 2021), and, once again, we see that the SPAC owners would own less than 10% of the merged firm.

One of the largest deals is with Singapore's Grab. The SPAC provided $ 0.5 billion here, and PIPE investors offered $4 billion. Grab had equity of $34.5 billion, and the combined merger value was estimated at $39 billion (Grab.com 2021). Grab was finally listed on the Nasdaq in December 2021. Since then, market capitalization has almost halved to $22 billion (as of January 21, 2022, finance.yahoo.com). The projections in April 2021 are no longer valid, perhaps because of the lockdown.

Figure 3: Relationship between SPAC, merged firm, and PIPE investors, illustrated using a recent example



To add spice to this article, we can mention that ex-President of the USA, Donald Trump, is also getting into this action. Digital World Acquisition Corp, a blank-cheque company, seeks to merge with Donald Trump's social media start-up Trump Media & Technology Group. The critics point out that the projected value of the firm is based on the hope that 80 million users will subscribe to its service by 2026. This projection is benchmarked optimistically with Netflix and Disney-plus, which already have more than 100 million subscribers each. However, this forecast may not be easy to achieve if we consider that Fox News only has 1.2 million subscribers (The Economist 2021, Palma, Fontanella-Khan, and Nicolaou 2021).

Indeed, many other SPACs have been blamed for buying targets at high values based on flimsy valuations (Kruppa and Aliaj 2021). Many targets give wild projections before the deal and reduce these projections to a fraction after the merger. For example, App Harvest forecast sales of $20 to $25 million for 2021 before the merger and reduced

this forecast to $7 to $8 million after the merger, leading to a 20% fall in share price (Powell 2021a). Similarly, Microvast's forecast revenue of $230 million for 2021 before the merger and reduced this forecast to about $ 150 million after the merger (Powell 2021b). Regulatory bodies are therefore examining such issues for fraud.

Moreover, a media review shows that SPAC rules and regulations are being rediscovered with each experiment. For example, there is a rule that when a SPAC is formed, it should not have any specific target in mind (Maiden 2006). This rule is being investigated in the Digital World Acquisition Corp case. The Securities Exchange Commission (SEC) is investigating if the sponsor of this SPAC had already contacted the Trump Media & Technology Group before the SPAC was formed (The Economist 2021). Suspicions were raised because the merger was agreed upon a few weeks after the SPAC was formed. Most SPACs take over a year to find a suitable target (Jenkinson and Sousa 2011). Some do not find one and return money to the investors.

Multi-billionaire Bill Ackman learned that a SPAC could not buy a public company or a part of a public company. His $4 billion Pershing Square SPAC attempted to purchase Universal Music Group from Vivendi (Brower 2021, Aliaj 2021).

3. Critical analysis: winners and losers

Firms may be tempted to merge with SPACs because it is less cumbersome and costly than an IPO. Secondly, with many SPACs chasing a limited number of promising targets, firms can get a high value for their existing shareholders rather than the shareholders of the SPACs (Crabb 2021). Even the PIPE investors get a better offering since they are more astute. Thirdly, the target management is aware that time is running out for the SPAC and the SPAC sponsors need to close the merger, even at an unfavorable price (Sagayam and Shanks 2008). SPACs, therefore, are useful for small, underperforming firms with high debt but low liquidity to find both capital and liquidity (Datar, Emm, and Ince 2012).

Of course, if the deal comes through, the most exciting rewards go to the sponsors of SPACs who have obtained shares of the SPAC at lower prices or warrants in the SPAC, often representing 20% of the shares (Jenkinson and Sousa 2011). For example, Michael Klein made $690 million, while Palihapitiya made $408 million from their sponsored SPAC deals (Asgari, Mathurin, and Campbell 2022). The losers are usually the retail investors. Box A below indicates that there is a potential for collusion between sponsors and the owners of private firms.

Box: Modelling a possibility for collusion: An example

The table below uses a fictive example to illustrate how the dynamics of collusion work. We assume that a SPAC raises 250 million Euros. The sponsors invest 10 million Euros but get 20% of the shares if they find a suitable target. The other 240 million Euros are raised by retail investors. Since the SPAC has 250 million Euros in cash, the sponsors would get 50 million Euros at the time of merger (a profit of 40 million Euros) and the retail investors would lose this 40 million Euros. Therefore, retail investors need to recoup this 40 million Euros if they are agree to a merger.

The target private firm that the sponsors find is worth 150 million euros. However, with unrealistic future growth rate assumptions, the value is inflated to 350 million Euros. For example, if earnings in year 1 are expected to be 6 million Euros and cost of capital is 10%, with a realistic growth rate of 6%, the firm is valued at 150 million Euros (E/(k-g)). However, if the expected growth rate is increased from 6% to 8.29%, the value of the firm increases to 350 million Euros. Since the target firm is private, there is little information to verify the assumptions.

If these assumptions are accepted, the combined firm would be worth 600 million Euros. After negotiating with the founders, the sponsors declare that the founders are willing to take a cash discount of 50 million Euros and their shares would be worth only 300 million Euros. The remaining 300 million Euros would be split between the sponsors and the retail investors in the 20:80 ratio or 60 million Euros and 240 million Euros. As a result, in the merged enterprise, the retail investors would not expect to lose money. Indeed as long as the discount agreed by the target firm managers is at least equal to the expected gain of the sponsors, the retail investors would agree to the merger. The bigger the target firm, the less the percentage discount required for the cash deal.

Of course, once the merger takes place, the market will look at the realistic value of the enterprise based on realistic growth expectations. The value of the post-merger enterprise would fall back to 400 million Euros (250 +150). The sponsors would still make a profit of 30 million Euros on their 10 million Euros invested (which is a 200% return). The target firm shareholders would still make a profit of 50 million Euros since their portion of shares are now worth 200 million Euros rather than a realistic 150 million Euros. This 80 million Euros profit of sponsors and target firm managers is at the cost of the retail investors.

(All figures in Millions of Euros)	Invested	Profit/Loss	Comment
SPAC			
Sponsors	10	40	20% of SPAC value =50
Retail investors	240	-40	80% of SPAC Value (250-50)
	250	0	
Target firm (private)			
Realistic value	150		6/(.1-.06)
Optimistic value	350		6(.1-.0829)
Agree to a cash discount	300		
Pre-merged firms (250+350)			
Sponsors	60	50	10% ownership
Target company shareholders	300	-50	50% ownership
Retail investors	240	0	40% ownership
Total	600	0	100%
Post-merger value (250+150)			
Sponsors share	40	30	(40-10)
Target company shareholders	200	50	(200-150)
Retail investors	160	-80	(160-240)
	400	0	

Indeed, the data shows that most SPACs hardly break even. Since they perform worse than IPOs, some have wondered if the behavior of retail investors buying shares in SPAC is rational (Datar, Emm, and Ince 2012). We consider that people get attracted by a small percentage of SPACs showing high returns. According to Spacanalytics.com, about 20 SPACs have given returns from 100% to 1050%. However, by the time we reach the 30th, returns are down to 23%. With a population of 613 SPACs in the USA, these top 30 only represent 5% of the SPACs. Even if we compare with 199 completed SPAC mergers, 90% of the merged firms are trading below the opening price, and the average loss to investors has been 40% (Asgari, Mathurin, and Campbell 2022).

Since the media focuses on the magnificent returns of a few deals, retail investors hope to get companies cheap. It gives smaller investors the chance to put money into early-stage ventures because traditional IPOs are often sold initially to institutional investors. However, as we are seeing, the SPAC structure carries high fees and risks, and larger participants get much better deals than retail investors. It is commonly known that most mergers are value-destroying. Therefore, it is ironic that public investors vote to go into a merger even after the market informs them that the merger will be value-destroying by lowering the price of the shares in the SPAC below book value (Jenkinson and Sousa 2011). A simple strategy for the public would be to redeem their shares at book value (plus interest) if the market price of the shares in the SPAC falls in the week after the announcement. If the market price of the shares in the SPAC rises after the announcement, the optimal strategy would be to sell the shares in the SPAC the day before the merger decision is taken (Jenkinson and Sousa 2011).

Short sellers such as hedge funds are also profiting from the market. They know that the SPAC has two years to make a deal. With so many SPACs, there may not be enough targets. The data from spacanalytics.com indicates that at the end of 2021, 588 SPACs with $158 billion were looking for acquisitions. In 2015, Gloo Networks raised £30 million but never made a deal (Asgari, Bradshaw, and Massoudi 2021). Short sellers also know that the public is being taken for a ride and that prices will fall (Aliaj and Kruppa 2021).

At a more macro level, countries are trying to control fraud, but at the same time, they would like to promote their financial markets by introducing more permissive regulations. In the US, the SEC has already warned SPACs about selling themselves with misleading predictions and that it will take a closer look at their accounting. Harsh punishment should follow for those that misbehave. However, other countries are seeking to lure SPACs. For example, the UK changed its rules to enable listings of SPACs in July 2021. But only one SPAC was floated in the UK in 2021 (Elder 2022). Singapore has recently had two SPACs (Daga 2022). India is considering allowing SPACs but is in no hurry to change its laws (Lai 2021).

4. Policy recommendations

Even though the SPAC boom seems to have passed its peak, it still represents significant amounts of new money. Other jurisdictions are getting into the game.

The reality is that the good private firms that need liquidity just go for a direct listing. The merger with SPACs permits valuations based on forecasts that a direct IPO does not allow. These flimsy valuations create risks for retail investors who do not listen to markets by selling their SPAC shares if their value falls below par value when the merger with the target is announced. Therefore, if countries want to open the market for SPACs by introducing regulation on SPAC, they need to be careful to prevent fraud towards retail investors. If retail investors consider the stock market a rigged game with no possibility of winning, it may break the market.

Nevertheless, the process of criminal action and punishment is long. Instead, we need to align the interests of the sponsors and retail investors by ensuring fair valuation and avoiding discounted shares or warrants. The sponsors should only make money over the longer term if the merger is adding value. This means that sponsors will be obliged to ensure due diligence at the time of the valuation of the target and later participate in the governance of the firm.

Countries could also consider giving SPAC investors more time to close deals. This extension would allow them to search patiently for deals where their shareholders can gain.

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Information Asymmetry and the Role of Regulations: A Corporate Governance Perspective

Debarati Basu

On the one hand, there are individuals and institutions looking for opportunities to invest their savings and increase their future consumption ability. On the other hand, there are people with business ideas worth investing in but not enough money to meet the investment need. These people, often managers and entrepreneurs, are looking for ways and means to raise funds for their investment idea. Capital markets help the two hands meet by matching the demand and supply of money.

Capital market efficiency requires a smooth flow of capital from the investors to the managers and entrepreneurs. However, the effective allocation of capital is hampered by information asymmetry. Full information on investment options is available only to the insiders (management/entrepreneurs), but the investment decision is taken by the outsider (savers). Two seemingly similar investments (say similar tenure, base investment, and management quality) may yield very different returns (high for a good investment versus low for a not-so-good investment) based on hidden risk factors known only to the insiders. Not being privy to such information would result in the investor's inability to identify the investment type and distinguish between the two investments. This would lead to mispricing of the investment options (refer to Figure 1).

Unhappy with such mispricing, the good manager would leave the market and seek alternative (and cheaper) funding options. The not-so-good manager, happy with a cost of capital lower than expected, would stay on in the market, creating a lemons problem (Akerlof, 1970). This may lead to a breakdown of the capital markets. Thus, the effective flow of capital requires the effective flow of information.

Figure 1: Information asymmetry and its consequences on price discovery

Type of Investment / Type of Disclosure	**Good Investment**	**Not-So-Good Investment**
Full disclosure	Correctly identified and priced higher (lower cost of capital)	Correctly identified and priced lower (higher cost of capital)
Limited disclosure	Incorrectly identified and average priced (average cost of capital)	Incorrectly identified and average priced (average cost of capital)

Many capital market resolutions have been formulated to combat issues that arise from information asymmetry. These include (a) pre-committing to increased disclosures through optimal contracting, (b) introducing monitoring systems that dis-incentivize concealing information or incentivize desired outcomes, (c) signaling information through reputation, legitimacy, and firm choices, such as type of financing used, and (d) setting in place governance frameworks that increase accountability.

Information gaps have also led to the proliferation of many information intermediaries that privately source and produce information from insiders (generally for a fee) and help reduce information asymmetry. Such intermediaries include financial analysts, proxy advisors, credit rating agencies, and the financial press. Healy and Palepu (2001) and Bergh, Ketchen, and Orlandi (2019) provide an extensive review of our understanding of information asymmetry in the finance and management disciplines, respectively, and discuss some of these resolutions.

Another key resolution to information asymmetry has been the role of regulations. Leuz and Verrecchia (2000) discuss how increased information availability reduces the cost of capital for firms. Burgeoning regulations setting out disclosure and reporting mandates and aimed at improving governance have become a critical and recurring policy issue globally. Progressive global integration, worldwide capital flows, and the resultant increase in the need for standardization (for example, through the adoption of the International Financial Reporting Standards – IFRS across more countries) have spurred more regulations. Multiple financial crises and corporate frauds have led to large-scale regulatory reform across developed and developing nations.

Do we really understand the effect of different types of regulations?

The last two decades have seen a rapid increase in the pace and frequency of regulatory reforms related to corporate governance in many markets worldwide. For example, since embarking on corporatisation of the economy in the 1990s, China has introduced many regulations. Aimed at allowing state-owned enterprises to keep their ownership intact while disallowing harmful administrative interventions, China has seen old organs of governance (like the Party Committee and Union) transition to newer governance mechanisms like shareholder meetings and boards of directors. This period has seen several reforms: the introduction of the Chinese Securities Law, multiple regulations by the China Securities Regulation Commission to improve board governance (increase board independence, etc.), issuance of the Code of Corporate Governance for Listed Companies, amendment of the Companies Law in 2005, then 2014 to provide more teeth to the governance regulations issued, changes to the Securities Law in 2006, then 2013 to improve the protection of minority shareholders, including the Split

Share reform in 2005, and altering and updating listing rules across different stock exchanges (for example, the Shanghai Stock Exchange listing rules in 2008).

Similar changes to improve governance have been seen in many countries, particularly in Asia, including India, Malaysia, Korea, Thailand, and Singapore (see the OECD Survey of Corporate Governance Frameworks in Asia, 2017), along with regulatory changes seen even in countries like the US and the UK.

Interestingly, most of these regulations have been two-pronged and required newer disclosures and structural changes. Let us consider a specific regulatory change such as Clause 49 in the Indian context to understand this further.[1] A part of the listing agreement to the stock exchange in India, Clause 49 was formulated by the Securities Exchange Board of India (SEBI) in 2000 and later amended majorly to clarify the requirements and increase the muscle of the mandates in 2004-05. After multiple committees, amendments, and delays in requiring compliance, the regulation came into effect in January 2006 and remains a significant governance regulation in India. In essence, it reflects the objectives and processes of the Sarbanes-Oxley Act of the US (SOX), another critical governance regulation.

What did Clause 49 require? Similar to the SOX, Clause 49 required qualifying firms to disclose more information on governance and management perspectives through the Corporate Governance Report and Management Discussion and Analysis sections of the annual reports, respectively. In addition, the clause required firms to make structural changes to governance which included introducing sub-committees to the board of directors, altering the definition of independent directors, and setting a minimum requirement for representation of independent directors on the board. Many papers examined the benefits and costs of SOX in the US (Ge and McVay, 2005; Engel, Hayes and Wang, 2007; Zhang, 2007; Linck, Netter and Yang, 2009; Jain and Rezaee, 2010), studying the consequences of governance changes mandated by the Act. Different from the dispersed ownership setting in the US, Clause 49 in India, where ownership is concentrated, also saw a few papers investigate the impact of governance changes. Despite poor compliance, studies found a decline in the cost of capital (Bhattacharyya, Raychaudhuri and Rao, 2008) and an increase in firm value (Black and Khanna, 2007; Dharmapala and Khanna, 2013) due to improved governance arising from Clause 49.[2] Interestingly, the empirical strategy in most of these studies has been based on measuring changes in board structure or composition.

[1] The corporate governance regulations like Clause 49, introduced in India since early 2000s, are now all incorporated in the Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015 (SEBI LODR). Refer to https://www.sebi.gov.in/legal/regulations/mar-2022/securities-and-exchange-board-of-india-listing-obligations-and-disclosure-requirements-regulations-2015-last-amended-on-march-22-2022-_57105.html, last accessed on 24th March 2022.

[2] As of 2007, BSE disclosed that less than 50% of qualifying companies were compliant with the requirements of Clause 49 (see Jackling and Johl, 2009). Also refer to https://economictimes.indiatimes.com/sebi-pulls-up-20-clause-49-violators/articleshow/2360322.cms?from=mdr, last accessed on 20th February 2022.

Like the above example, most regulatory studies have used tangible changes to examine the effectiveness of new mandates. However, regulations can be of three types (see Figure 2),

a) **Type A**: mandates that require both structural changes and new disclosures. For example, Clause 49 of the Listing Agreement in India (as discussed above).

b) **Type B**: mandates that require only structural changes. For example, the 25% Minimum Public Shareholding (MPS) Norms introduced in India in 2013 required promoters to reduce their stakes to less than 75% in all listed companies.

c) **Type C**: mandates that require only disclosures. For example, Clause 35, introduced in India in 2001, required all listed companies to disclose, for the first time, the shareholding pattern in a prescribed format (along with identifying and classifying the percentage of promoter ownership).[3]

Type A regulations, requiring both structural changes and disclosures, are most common, while type B and type C are not. Thus, the extant investigations into regulatory impact ensure that we understand the pros and cons of the structural changes introduced (both within type A and by type B regulations). Still, it almost completely (and often conveniently) ignores the impact of disclosures (new information made available within type A or by type C regulations).

Figure 2: Types of regulations

[3] Most of these regulations are now rolled into the SEBI's Listing Obligations and Disclosure Requirements Regulations, 2015 (LODR).

The use of such combined information and action-based mandates has made it difficult to segregate the impact of new information from the effect of structural changes. More importantly, while structural changes are easier to analyze given the tangible changes to structure post-regulation, information-only disclosures are challenging to examine. It is particularly challenging since the pre-regulation period is a black box with no information, and the post-regulation period reveals new information making a pre-post comparison unwieldy. It creates empirical issues associated with identification (no counterfactuals, no control groups, etc.).

Leuz and Wysocki (2016), in a review of disclosure and reporting regulations, highlight the significant role of regulations in curbing information asymmetry but conclude that evidence on the usefulness and real effect of regulations is rare, which makes the economic justification of regulations difficult. They conclude that evidence on the causal effect of regulations is difficult and rare since a clean identification strategy is challenging. Thus, market-wide effects of such regulations remain unknown, not just in the US but also in contexts outside the US, which the literature has largely ignored. So, little is known about the benefits or firm-level impact of such disclosure-only regulations (Leuz, 2018).

Are disclosure-based regulations welfare-enhancing?

Let us consider Clause 35 of the Listing Agreement of SEBI as an example to explore this. Multiple reasons make this regulation novel. First, Clause 35 only required disclosing more information and no real structural changes. Second, this was the first time SEBI required the identification of blockholders as promoters (insiders) and non-promoters (outsiders). This is particularly important in an economy like India, where concentrated ownership in the hands of insiders is the norm and therefore, type two agency issues of the principal-principal kind between majority owners and other owners are more common. Before this, the ownership and control rights of insiders versus those of outsiders were not possible to estimate at all (Sarkar, 2010). So, stakeholders like capital providers were unaware of the actual manifestation of agency issues at any firm. Information about ownership concentration and the identity of the largest shareholder are critical inputs in assessing the scope of owner-owner agency issues (Lim et al., 2014).

The availability of ownership information post Clause 35 meant that stakeholders could now estimate where promoters or insiders had more control. Therefore, this mandate would have a differential impact on firms where promoter ownership is concentrated (so the scope for ownership-related agency issues is higher) and firms with more diversified ownership (where the scope for ownership-related agency issues is lower). Clause 35 appears to provide a clean setting to examine the impact of ownership disclosure. Still, the fact remains that the pre-Clause 35 periods had no shareholding information, and only the post-Clause 35 periods provide this ownership information. Consequently, it is difficult to empirically examine the usefulness of the new disclosure on the shareholding pattern.

How does one empirically test the impact of a disclosure?

Another characteristic of the Indian economy is the presence of business groups. Loosely affiliated firms with formal or informal ties are the norm in the Indian economy. Examples of business groups include the Tata group, Larsen and Toubro group, and Reliance group. While firms affiliated with such groups account for only about 35% of listed firms in the BSE A and B groups, they are economically significant, contributing more than 65% of the market capitalization and total assets.[4] These firms also display promoter control, with at least a 51% promoter stake on average. These groups have also been documented to have complex webs of ownership aimed at increasing control of the affiliated firms (refer to the literature on ownership and control wedge; see Kali and Sarkar, 2011; Claessens et al., 2006; Gopalan and Jayaraman, 2012; Lugo, 2019). Contrary to this are standalone firms (not affiliated with any group), which account for 65% of firms but only about 35% of market capitalization. The promoter ownership in these firms is also lesser than the majority requirement (51%), implying less promoter control.

Thus, group-affiliated firms are expected (and have been documented) to be ripe for agency-related issues. Unraveling of frauds within business groups has been testimony to this. The notable ones include Kalyani Steel during the 1990s, Daewoo India in 2004, and Mardia Chemicals in 2005, the last being for approximately USD 23 million. This was followed by the massive accounting fraud at Satyam in 2008, where cash and bank loans were overstated by INR 53.6 billion (approximately USD 1.2 billion).[5] More recently, the Indian economy has been fighting similar ownership-based agency issues that have led to fraud at DHFL India and Yes Bank.

Group affiliation thus overlaps with promoter ownership in interesting ways. More importantly, group affiliation for every firm is identified, both pre- and post-Clause 35. Let us consider the Tata group as an example. The Tata group is one of the largest groups globally with multinational business interests across various sectors, including automotive, steel, power, airlines, jewelry, consumer products, and hotels. Tata Sons is the principal investment company and the promoter of Tata companies. If we visit the Tata Sons website (https://www.tata.com/), it is easy to maneuver to a page on their website - https://www.tata.com/investors/companies, where we can find the list of Tata group companies. However, while this available information enables us to link each company to the group it belongs to, ownership information is not available. The actual ownership stake of Tata Sons and other Tata group companies in every group company varies widely. In most Tata-group companies, Tata Sons does not

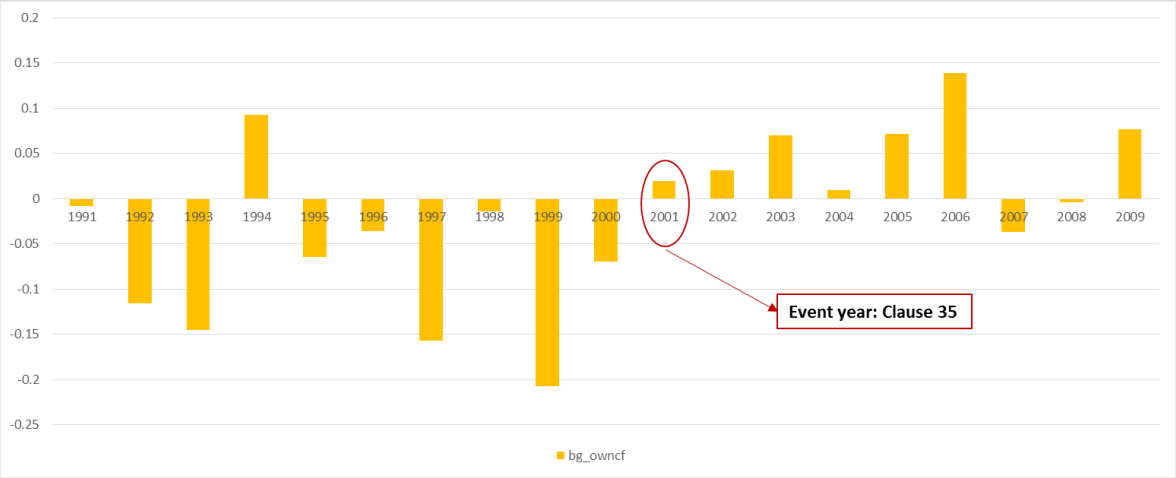
[4] The A and B group stocks are the most liquid stocks of the Bombay Stock Exchange, which is the oldest stock exchange in Asia with a market capitalization of ~USD3.7trillion and more than 5000 listings.

[5] While only examples from India are discussed here, extant literature has documented the higher occurrence of frauds and earnings manipulation in business group like structures across the world (eg: Albrecht et al., 2010; Kim and Yi, 2010; Beuselinck and Deloof, 2014). Chen et al. (2019) have developed a model specifically for detecting frauds in business groups. Large scale frauds like Procomp, Enron, Parmalat, and Daewoo are global examples of frauds in business groups.

hold a majority stake (ownership ranges from 22 to 31%).[6] Thus, it is (and was) possible to associate a firm with the group it belongs to and differentiate it from a standalone firm, even before or without the ownership information made available by Clause 35.

Basu and Sen (2020) attempt to resolve the empirical issues with identification using this overlap. Set in the context of capital markets, the authors find that disclosure-only regulations are welfare enhancing. The availability of information on promoter ownership and the revelation of the scope for agency issues are efficiently used by capital providers to reallocate capital. Funding constraints are found to increase for firms with higher insider ownership, particularly those with poorer compensatory mechanisms like governance and transparency, relative to firms with lower insider ownership. Figure 3 reveals the impact of Clause 35 on funding constraints faced by higher insider-owned firms relative to lower insider-owned firms in the Basu and Sen (2020) sample. The reallocation happens even within group-affiliated firms that differ based on promoter ownership levels. Thus, mandated regulations on information disclosure are an effective policy tool to reallocate capital efficiently.

Figure 3: Impact of Clause 35 on financial constraints; source: Basu and Sen (2020)



This is a step forward and can open up multiple avenues for further research on the relevance and impact of different types of regulations. It is crucial that the structure of regulations is understood and made a critical dimension of examining their impact. More so, in a world of increasing regulatory mandates, not just in the governance space but also beyond.

[6] Refer to https://www.livemint.com/Companies/cJRNMVUFVnjsG3Xm8Y3chN/Who-owns-how-much-in-Tata-group-firms.html.

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Climate Action and Indian Steel Sector: Commitment at COP26 Glasgow 2021

Samit Paul

The steel industry is one of the key contributors to the manufacturing output of India. The availability of coal, iron ore, and cheap labor are the major factors behind the growth of the steel industry in this country. As of October 2021, India is globally ranked second in producing crude steel.[1] In 2020-21, it produced 102.49 million tonnes of crude steel. In 2021-22, the production was further expected to increase by 18% and touch the 120 million tonnes benchmark.[2] Keeping pace with the production, the export figure also shows an upward trend in this industry. The export of finished steel rose by 121.6% in April 2021 compared to that of April 2020. As a result, the steel and associated metallurgical industries have become a favorite investment destination for foreign investors. As per the Department for Promotion of Industry and Internal Trade (DPIIT), these industries have attracted USD 16 billion of foreign direct investment (FDI) inflows from April 2020 to June 2021.[3]

Despite this tremendous growth, the steel industry often undergoes excessive environmental scrutiny as it creates massive pollution in its day-to-day operations (Quader et al., 2015). Other concerns are steel slag production, water usage, and waste management. Specifically, a huge emission of pollutants, including oxides form of carbon [carbon dioxide (CO_2) and carbon monoxide (CO)], sulfur, nitrogen, and other forms of particulate matter (PM) by this industry is always under the rudder of the regulatory invention. More specifically, the steel industry is one of the largest sources of CO_2 emission and thus contributes significantly to air pollution (Kim & Worrell, 2002). The energy consumption in Indian steel plants is on average 6 to 6.5 Giga calories per tonne of crude steel. This energy consumption is significantly higher than the global consumption of 4.5 to 5 Giga calories per tonne range. In 2019, a published report by Global Efficiency Intelligence showed that the global steel industry produced almost 3.6 Gigaton of CO_2. Among this, 3.1 Gigaton corresponds to the blast furnace – basic oxygen furnace (BF-BOF), whereas the remaining 0.5 Gigaton corresponds to electric arc furnace (EAF) steel production. According to this report, India is at the second position in the CO_2 intensity of the EAF process. Thus, reducing greenhouse gas (GHG) emissions or simply controlling CO2 emissions is highly desired for firms belonging to the Indian steel industry. Moreover, the primary customers of steel firms, such as automobile companies and construction

[1] https://www.indoasiancommodities.com/2022/01/31/global-crude-steel-production-up-by-3-7-in-2021-world-steel-association/

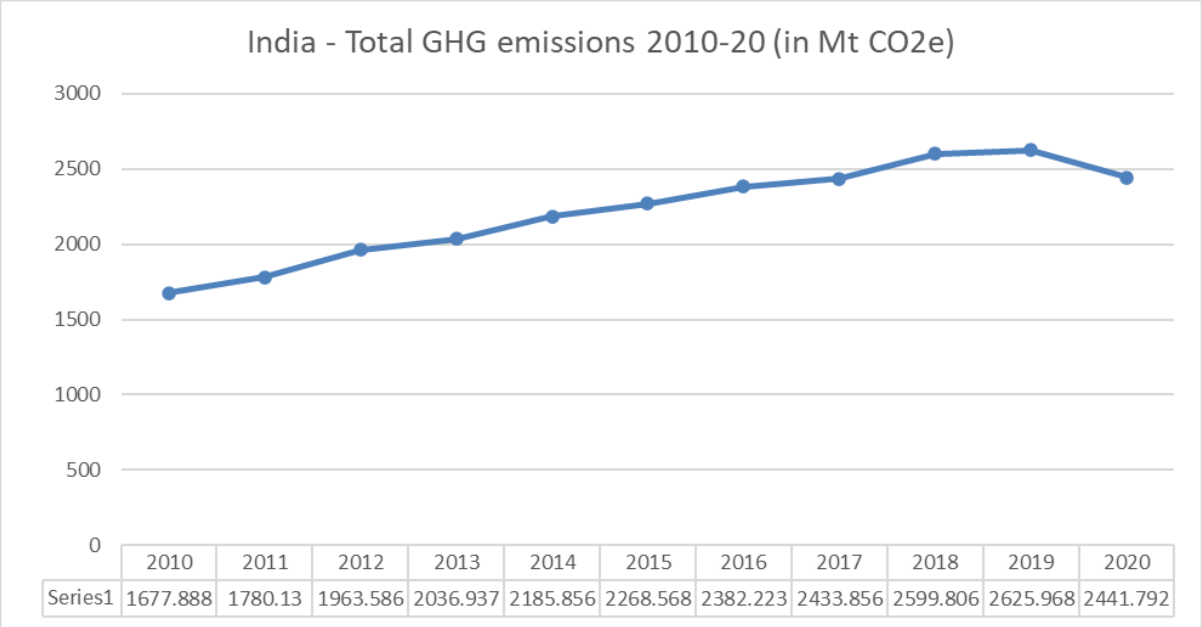
[2] https://www.ibef.org/archives/industry/steel-reports/steel-presentation#:~:text=In%20FY22%2C%20crude%20steel%20production,production%20stood%20at%207.8%20MT .

[3] https://dpiit.gov.in/sites/default/files/FDI%20Factsheet%20December%2C%202021.pdf

firms, are keen to reduce emitted carbons across their value chains. Hence, steel firms are under tremendous stress for reducing carbon emissions and have set period-wise targets to achieve the ultimate objective.

A recent report by the World Steel Association in 2021 suggests that several steel companies worldwide set an ambitious goal of carbon neutrality by 2050. These companies include Baowu Group, Nippon Steel, U. S. Steel, POSCO, Arcelor Mittal, and Tata Steel. Although only Tata Steel as an Indian steel company is present in the list, it's expected that others will also set similar targets for the near future. At COP26, the 26th Conference of Parties, India has set a carbon emission target of net-zero by 2070. Two of the immediate short-term goals essential to achieve this milestone are to reduce CO_2 emissions by 1 million tonnes and lower carbon intensity below 45% by 2030. But, the current scenario is not much encouraging. The CO_2 emissions in India have been steadily increasing over the decade. Figure 1 shows the increasing trend of total GHG emissions from 2010-20.

Figure 1: GHG emissions in India



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Series1	1677.888	1780.13	1963.586	2036.937	2185.856	2268.568	2382.223	2433.856	2599.806	2625.968	2441.792

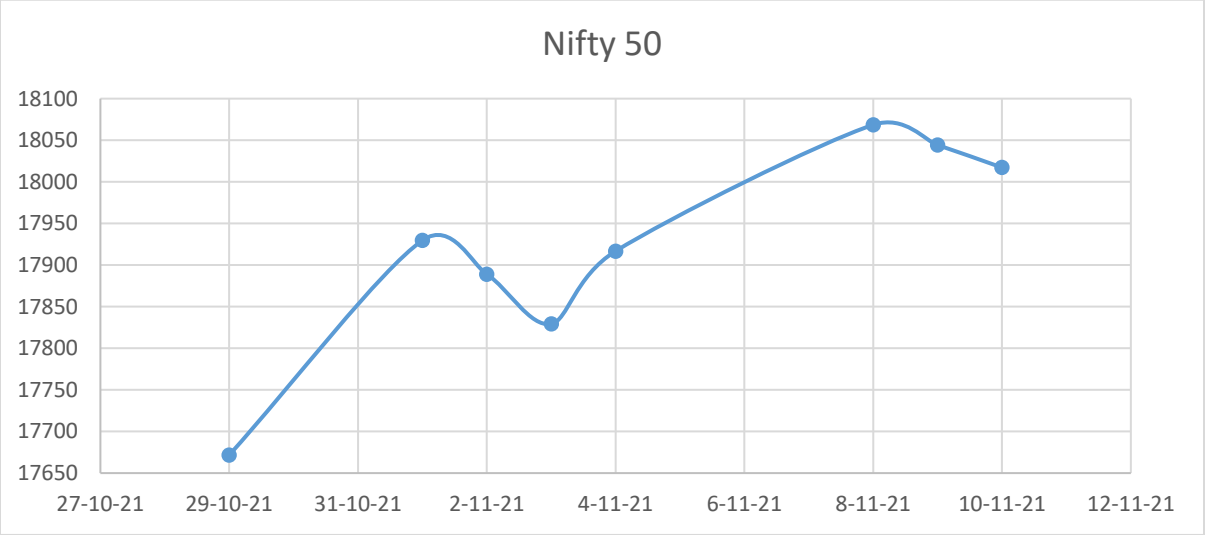
Source: Global Carbon Project, 2020

As shown in the figure, the GHG emission in India stands at 2,442 million tonnes of CO_2 equivalent as of 2020. The significant drift in 2020 may be due to the COVID-19 pandemic and countrywide lockdown in India.

Investors' Reaction to COP26 Announcement:

On 1 November 2021, the honorable Indian Prime Minister Shri Narendra Modi delivered a speech on India's climate action at COP26 Summit in Glasgow.[4] This speech was subsequently released on 2 November 2021. It's no surprise that such a national-level commitment would trigger some reaction in the Indian stock market. Eventually, the Indian market experienced a short-term positive price reaction post-announcement. Figure 2 shows how the Nifty 50 index moves around this period.

Figure 2: Movement of Nifty-50 Index

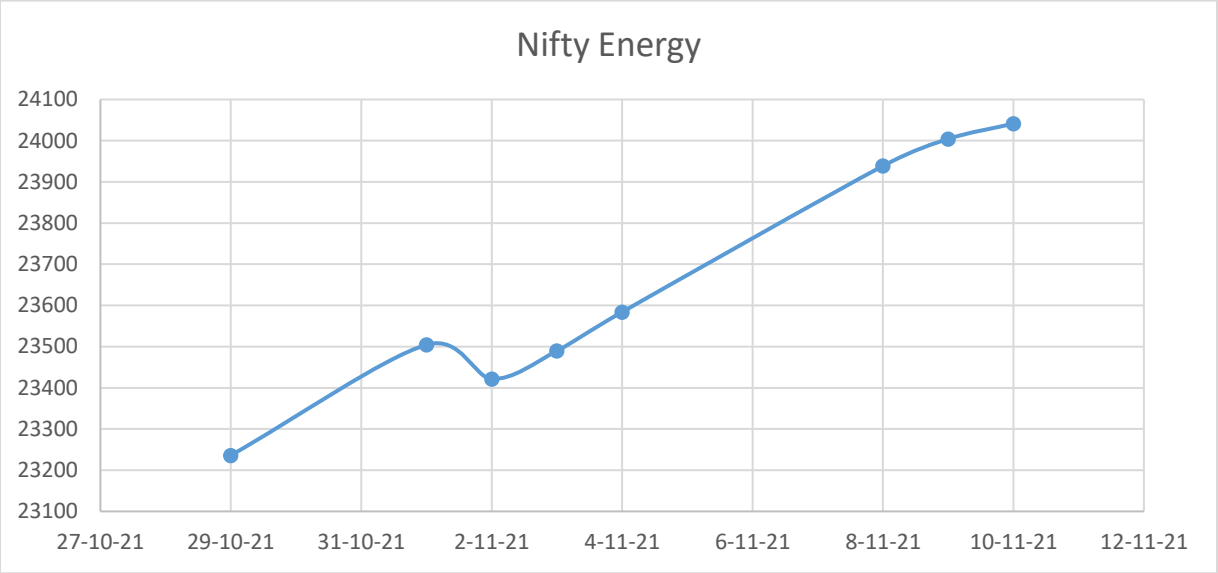


Source: author's calculation

It's also a matter of interest to gauge the reaction of energy investors to such optimistic national-level commitment. Figure 3 plots the movement of the sectoral Nifty Energy index during that period. It's evident from the plot that the energy investors also remain positive about this announcement. One important thing to note is that within 10-days (from 29 October 2021 to 8 November 2021), the Nifty 50 and Nifty Energy indices experience an upward movement of 400 and 700 points, respectively.

[4] https://www.mea.gov.in/Speeches-Statements.htm?dtl/34466/National+Statement+by+Prime+Minister+Shri+Narendra+Modi+at+COP26+Summit+in+Glasgow

Figure 3: Movement of Nifty Energy Index



Source: author's calculation

One may argue that the impact of climate action on market indices may not be the impact of the Glasgow Summit as it is a continuation of the Paris Agreement or announcement of the nationally determined contributions (NDCs). However, COP26 at Glasgow also achieves a few significant achievements. For example, almost 90 percent of the world is now covered by net-zero targets, compared to just 30 percent a couple of years ago. The global finance sector committed $134 trillion in assets to science-based net-zero targets. Around 40 countries are ready to invest in clean energy and phase out fossil fuels by next year. Moreover, more than 40 nations have decided to phase out coal power by 2040. Thus, it's not a surprise that the outcomes of the Glasgow Summit will positively influence the stock market even though significant investments are required, and the return on these investments is often uncertain.

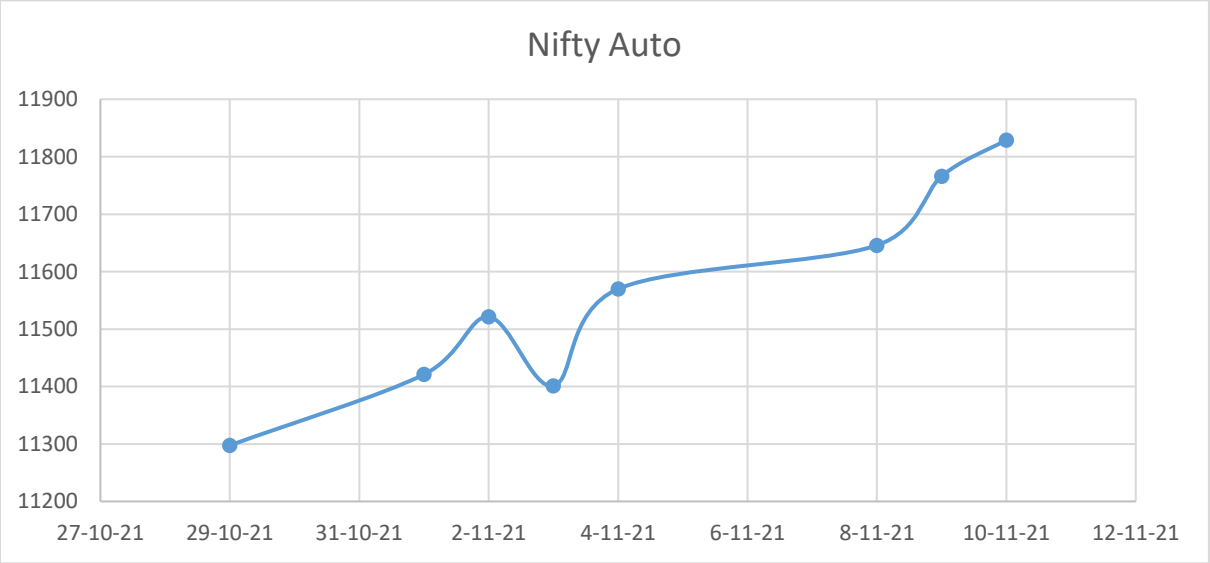
As discussed earlier, the primary customers of steel manufacturing companies are firms from the automobile and infrastructure sectors. Hoffman et al. (2018) and Hannon et al. (2020) document that many automobile manufacturers, including Toyota and Volkswagen, aim to minimize emitted carbon from their entire value chain. Therefore, it's also interesting to check the reaction of investors belonging to these sectors. Figures 4 and 5 plot the movement of Nifty Auto and Nifty Infrastructure indices during this period. Although the Auto index drops immediately after the announcement, it quickly rises again.

On the other hand, the infrastructure segment experiences a positive price movement in the post-announcement period. A possible explanation behind such positivity is again embedded in the pledges and commitments taken in the Glasgow Summit that have significant implications for businesses and investors. For example, the COP26 signals the accelerated flow of investment toward renewable energy, reforestation, electric vehicles, green steel,

low carbon steel, and sustainable agriculture. Overall, this movement indicates the positivity associated with the climate action committed at the global level.

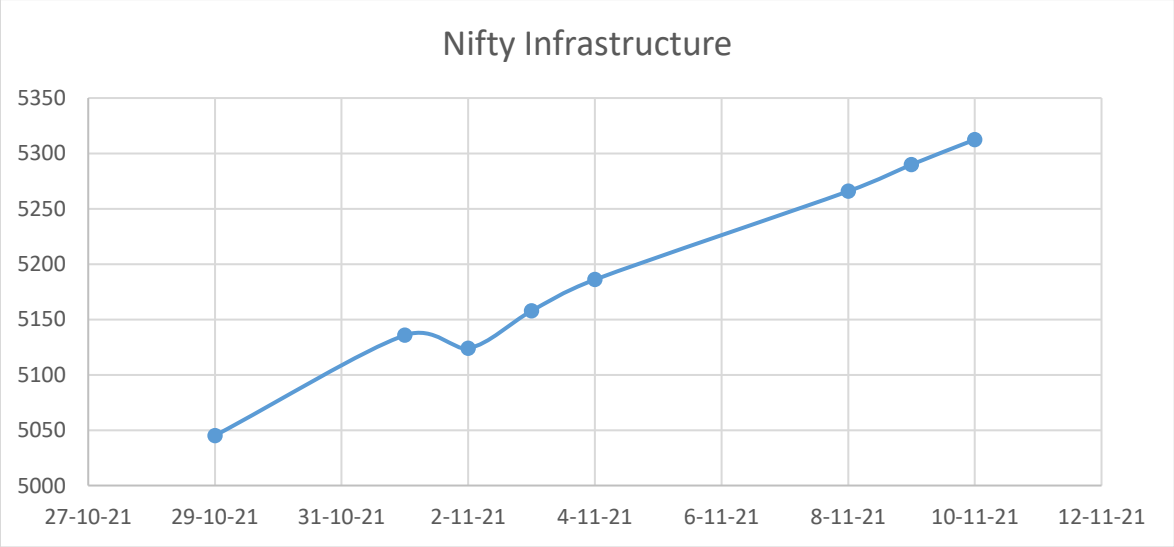
The overall positivity at the market level is expected to percolate on an individual stock level. Hence, it is imperative to explore whether investors of Indian Steel stocks also appreciate the Glasgow global climate summit outcome.

Figure 4: Movement of Nifty Auto Index



Source: author's calculation

Figure 5: Movement of Nifty Infrastructure Index



Source: author's calculation

Table 1 lists the returns earned by the eight Indian Steel manufacturers around this announcement. These eight companies are selected from the list of top 10 Steel Companies of India as identified by India's largest construction business magazine, Construction World (CW).[5] The stock prices of these eight stocks are sourced from the CMIE-Prowess database. Due to the unavailability of data, the other two companies are dropped.

Table 1: Returns earned by Indian Steel Companies

Company Name	Return on Date of Announcement	Cumulative Return: from date of announcement to 1 day after	Cumulative Return: From 1 day before to 1 day after
Tata Steel Ltd.	3.65%	4.90%	1.08%
JSW Steel Ltd.	2.92%	3.17%	0.81%
Hindalco Industries Ltd.	3.91%	2.97%	0.08%
Steel Authority of India Ltd.	8.45%	8.54%	6.20%
Vedanta Ltd.	-0.61%	0.43%	2.35%
Jindal Steel & Power Ltd.	3.21%	3.96%	1.14%
Jindal Stainless Ltd.	2.95%	3.42%	2.82%
Tata Steel Long Products Ltd.	1.37%	0.06%	0.13%

From the table, one can observe that majority of the stocks earn a positive return on the date of the announcement. And, the same positive return continues till the next business day as well. The cumulative returns for three days around the announcement are also positive in most cases. Thus, it can be inferred that the investors of Indian Steel companies have well received the climate change action at the global arena. Any future study exploring the abnormal returns earned by these firms using the market model could bring further interesting insights into these findings.

Given this background, it's further worth investigating how well India is prepared to meet the NDCs. More specifically, the measures adopted by the Indian steel industry to reduce CO_2 emissions in achieving the target are under the focus of the regulators. The Paris Agreement (2015), an international treaty on climate change adopted in December 2015, legally binds 196 parties to limit global warming below 2 degrees Celsius. To meet the objectives charted under this agreement, India and Sweden have launched the Leadership Group for Industry Transition to smoothen the transition of different sectors of India towards implementing NDCs. According to the Third Biennial Update report, ten other countries have joined the leadership group. Eleven companies, three out

[5] https://www.constructionworld.in/steel-news/top-10-steel-companies-in-india/31670

of which are from India, are also part of this group (MoEFCC, 2020). It's encouraging to find India's private sector is taking a leading role in addressing the challenges of climate change. The India Climate Collaborative (ICC) was founded in 2019 with top industry leaders to source necessary funding and build visibility on the climate action across the country.

Climate Action by Indian Steel Companies:

As mentioned earlier, Tata Steel Limited is actively involved in achieving the "net zero" emission goal. It has taken multiple steps to address the challenge of climate change by reducing GHG emissions. First of all, it sensitizes the Board and other senior management staff about the impact and implications of climate change by engaging the Cambridge Institute of Sustainability Leadership (CISL). In 2018, it set up a Centre of Excellence with the goal of reducing GHG emissions. All capital projects are evaluated by an internally fixed price of 15 USD/tonne.

Furthermore, in 2017, Tata Steel has installed India's first Solar PV Power Plant in the Noamundi iron ore mine to reduce CO_2 emissions by 3,000 tonnes per annum. A pilot project on Carbon Capture and Use (CCU) is initiated at Jamshedpur to capture the CO_2 emissions from the plant. The plant under this project captures CO_2 at the rate of 5 tonnes per day (TPD) and effectively uses the same in water treatment. Moreover, Tata Steel has adopted a highly efficient waste management mechanism by enhancing steel scrap usage, utilizing solid waste, and extracting value from by-products. The company will initiate more scrap-based facilities that will reach a billion tonnes of capacity by 2025.

Recently, in June 2021, JSW Steel became a member of The India H2 Alliance (IH2A) that aims to replace carbon with hydrogen as an alternative fuel. It envisages a 41% reduction of net carbon emission by 2030, considering 2005 as a base year. Similar to Tata steel, one of the initiatives by JSW Steel is the adoption of CCU technology that captures CO_2, which is then sold in the beverage industry. It also implemented a 20 million tonnes per annum pipe conveyor to transport iron ore with much-reduced carbon emissions. Moreover, a carbon sink is created to support systematic afforestation. Steel Authority of India (SAIL) has also adopted similar afforestation at Rourkela as a part of its study on Carbon Sequestration. SAIL has set a target of 2.3 tonne of CO_2 emission per tonne of crude steel production by 2030. The company has achieved an 18% reduction of CO2 in 2020-21 compared to 2005.

Future Plan:

Although climate action and NDCs have imposed additional stress on Indian steel companies, the future demand for steel production is expected to rise. The National Steel Policy, 2017 foresees an enhanced steel production capacity of up to 300 million tonnes as of 2030-31. In the last five years, steel consumption has increased to 74.1 Kgs per capita from 57.6 Kgs per capita. The scope for the growth of the Indian steel sector will be further enhanced by the thriving construction sector and developing automobile industry. Even the government aims to increase steel consumption in the rural sector.

With such a growth projection, the steel industry has a massive balancing task in hand. It has to grow but in an environment-friendly manner. The production should increase, whereas emissions should be reduced. These can be possible in two ways: first, the effort should be visible across the entire value chain; second, the application of technology in controlling the impact of GHG emissions. All members across the value chain should be sensitized about the climate action and the role of the steel industry in meeting the target. For instance, coal quality may impact CO_2 emission in the steel production process. Hence, the suppliers of coal should maintain the desired level of quality. Even cheap imports of Chinese supplies may further complicate the plan of achieving the target.

Similarly, distributors or customers may avail of 'carbon credit' benefits while supporting carbon reduction. In addition, changing customer preferences, e.g., usage of lighter yet stronger materials in the automobile industry, may reduce the CO_2 emission significantly. Moreover, regulatory barriers, such as carbon border tax for imports into the EU, are a threat to India, which compels the Indian producers to achieve their target as quickly as possible. In such a scenario, adopting a suitable technology can lead to process efficiency and thus help businesses achieve the target by reducing emissions. For example, Tata Steel has embraced the Internet of Things (IoT) to increase the scrap rate in the production process, which may ultimately reduce emissions.

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Swing Pricing in Mutual Funds: Indian Evidence

Priya Malhotra

Introduction

To protect investors' interests, India's capital market regulator, the Securities and Exchange Board of India (SEBI), announced on September 29, 2021, that open-ended debt mutual fund schemes would have a swing pricing structure. This paradigm does not apply to overnight funds, GILT funds, or Gilt with a 10-year maturity. Swing pricing enables an open-ended fund's net asset value (NAV) to adjust in response to significant redemptions in periods of market distress, thereby lowering the fund's liquidity risk. Swing pricing will be used exclusively in the event of scheme outflows, while a hybrid model with a partial swing will be used in normal times. Volatile times would entail a mandatory full swing. The swing factor will be between 1 and 2 percent, depending on the underlying credit and duration risk, and will take effect upon the regulator's declaration of market dislocation. However, the application of the swing factor to individual schemes has been delegated to asset management companies (AMCs) under the auspices of the Association of Mutual Funds in India (AMFI). Institutional investors are the first movers in times of market turmoil, compelling fund managers to redeem high-quality liquid securities. As a result, the remaining investors are left with a portfolio of low-quality, illiquid underlying securities. Swing pricing is similar to an exit load in that it discourages large redemptions by increasing the cost of exit.

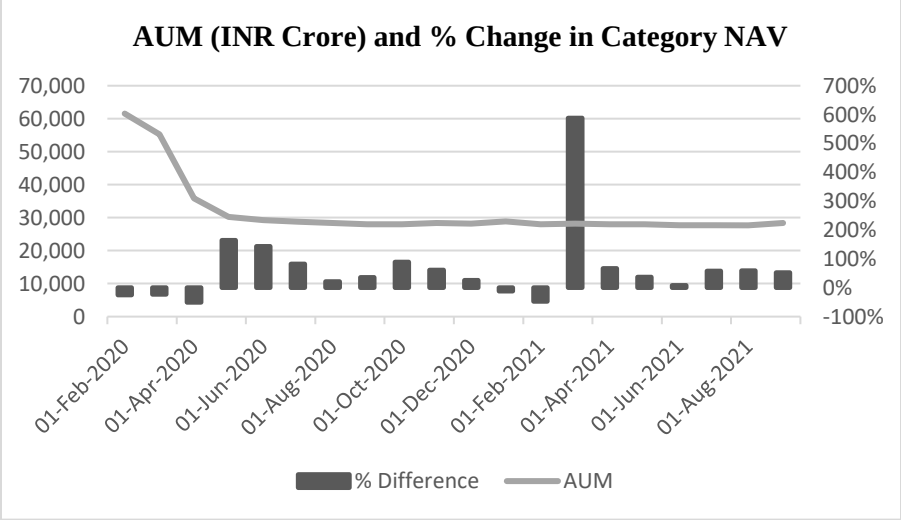
Brief Overview of the Indian Debt Market

The Indian debt market, which is one of the biggest in Asia, is divided into two segments: government securities and corporate bonds, with banks, financial institutions, insurance companies, foreign institutional investors (FIIs), and mutual funds all playing a prominent role in both. With daily average volumes of 10,000 crores and instruments spanning the maturity range, the $1 trillion G-Sec market is the segment's oldest and largest. The corporate bond market, which accounts for almost 18% of total domestic credit (the highest share among Asian peers), is active in the primary market but has a modest secondary market dominated by G-Sec turnover. The fixed income market is evolving rapidly for many reasons, including new products, increased liquidity, interest rate deregulation, enhanced settlement systems, and a quick pace of transition in rising economies such as China. After undergoing a historic transformation three decades ago as a result of economic reforms, India is now inching closer to opening its G-Sec market to more international investors through inclusion in global indices, a much-needed step given India's severe financial market access gap with peers such as South Africa and Brazil.

Mutual funds in India have become major players in equity and bond markets, providing crucial liquidity support and allocation of investible surplus. Indian debt mutual funds account for two-fifth of the entire industry's assets under management (AUM), approximately ₹14.72 lakh crores as of July 2021, as per the AMFI database. The pandemic-led crisis period witnessed a marked shift in the investors' preference from high credit risk funds to low credit risk funds. The countrywide lockdown and possibility of economic slowdown backed the investor concerns. In April 2020, Franklin Templeton announced the winding up of its six credit-focused funds.[6] The announcement came as a bitter shock to the investors leading to heavy redemptions and a net outflow of INR 19,239 crores from credit risk funds during April 2020 (See Figure 1).

Figure 1: AUM and Change in NAV (%) of Credit risk funds

The figure presents a trend in the Credit risk funds' AUM (primary axis) and percent change in category NAV (secondary axis) before the onset of the COVID-19 pandemic till August 2021.



Source: AMFI database

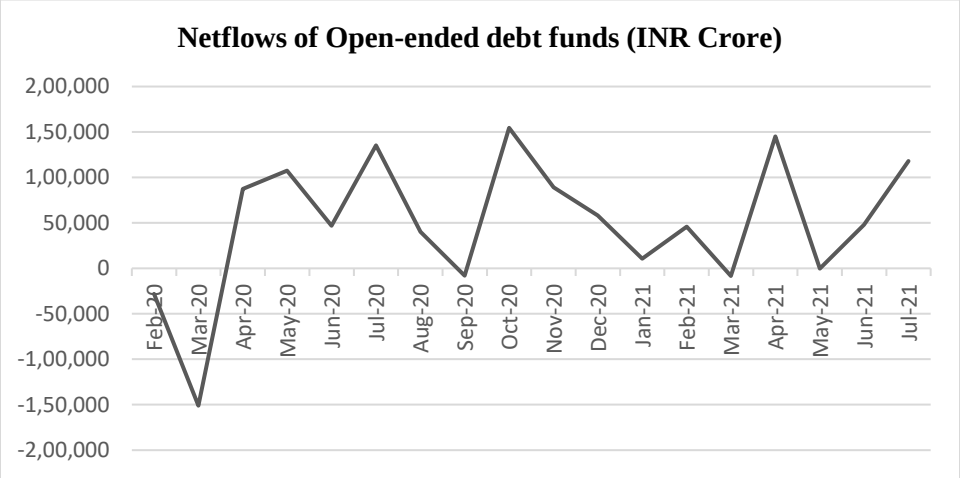
Lower-rated securities face significant liquidity constraints during market turmoil and stress, as investors become risk-averse and choose to lend only to higher-rated corporate bonds. The Franklin Templeton fund scandal damaged the faith of all debt mutual fund investors, who hurried to abandon not only the credit funds but also debt funds in general. However, quick intervention by the central bank and the SEBI minimized further damage to debt funds that gradually gained net flows after April 2020 (Refer to Figure 2). Credit risk funds, on the other

[6] These funds are Franklin India Low Duration Fund, Franklin India Dynamic India Accrual Fund, Franklin India Short Term Income Plan, Franklin India Dynamic Accrual Fund, Franklin India Credit Risk Fund, and Franklin India Income Opportunities Fund. These funds were offered under a clear strategy of having significant more exposure to A- and AA- rated instruments.

hand, have continued to lose investor interest, with AUM stagnant after a sustained decrease till June 2020.(see Figure 3).

Figure 2: Net flows of Open-ended debt funds

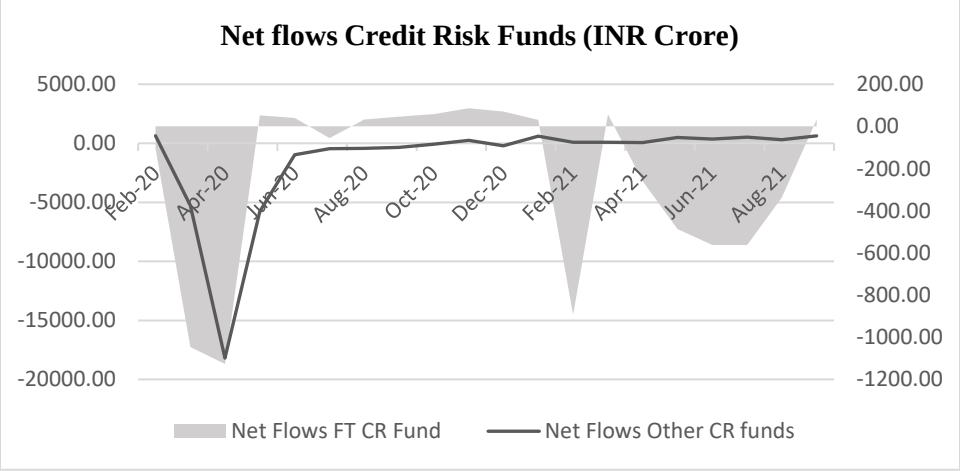
The figure presents net inflows and outflows (in Rs. crore) of the Open-ended fund category from February 2020 to July 2021.



Source: AMFI database

Figure 3: Net inflows/ outflows of Credit Risk funds

The figure presents a comparative view of net flows of the Franklin Templeton Credit risk fund vs. the rest of the funds in the category pre-pandemic till August 2021. Net flows of Franklin Templeton Credit risk fund are measured on the secondary axis ('000 crore).



Source: AMFI Database

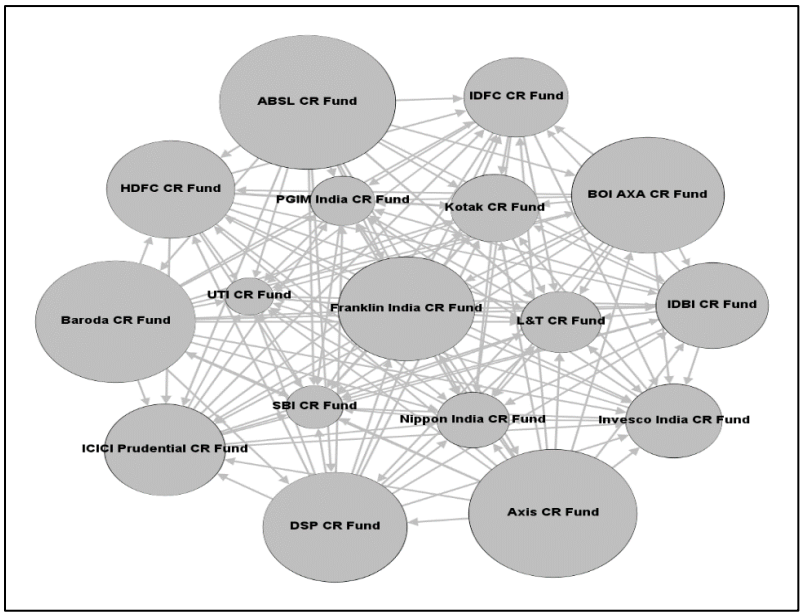
Why is Swing Pricing required?

Infrastructure Leasing & Financial Services (IL&FS), a non-bank financial corporation (NBFC) and shadow bank, defaulted on an INR 450 crore inter-corporate deposit with the Small Industries Development Bank of India (SIDBI) in June 2018. Soon after, it defaulted on an INR 1000 crore term loan, prompting rating agencies such as ICRA, CARE, and Brickwork to downgrade the company to the 'Junk' or 'Default' category. The sudden downgrade of one of the largest NBFCs sparked panic in the banking sector, which provides a significant portion of the short-term financing for shadow banks' long-term lending base. As a result, banks increased their caution regarding lending to NBFCs, resulting in a severe liquidity crunch in the market. In June 2019, Dewan Housing Finance Limited (DHFL) missed interest payments, prompting credit rating agencies to downgrade the company's entire short-term debt, paving the way for a classic financial market contagion. The stock market's panic selling exacerbated redemption pressure on mutual funds carrying NBFCs in their folio. The impending concerns of an ensuing debt crisis were exacerbated when the Covid-19 emerged, wreaking havoc on the Indian and global financial markets.

A similar and unwelcome crisis occurred in the Indian fixed income market when one of the largest mutual funds, Franklin Templeton Mutual Fund, experienced an avalanche of redemptions in six fixed-income funds exposed to a variety of credit instruments. The paranoia generated by the economic shutdown increased investor redemptions, making it even more difficult for fund houses to meet concerted redemption obligations amid a liquidity crunch. Franklin Templeton wound down six fixed-income funds to protect investor value while allowing for a gradual payout, freezing their immediate redemptions and allowing payouts contingent on asset liquidation. This action resulted in fund outflows from other AMCs' credit risk schemes, necessitating the intervention of the central bank and the provision of an INR 50,000-crore special liquidity facility to mutual funds. The degree of interconnection among credit risk funds illustrated in Figure 4 below explains the house of cards effect observed in panic-driven redemptions of credit risk funds.

Figure 4: Interconnected network of Credit Risk Funds

The chart illustrates the network of several credit risk funds in India. A node represents each fund. The degree of influence (out-degree) exerted on the network indicates the node's size. The arrow of the respective edge defines the direction of the influence.

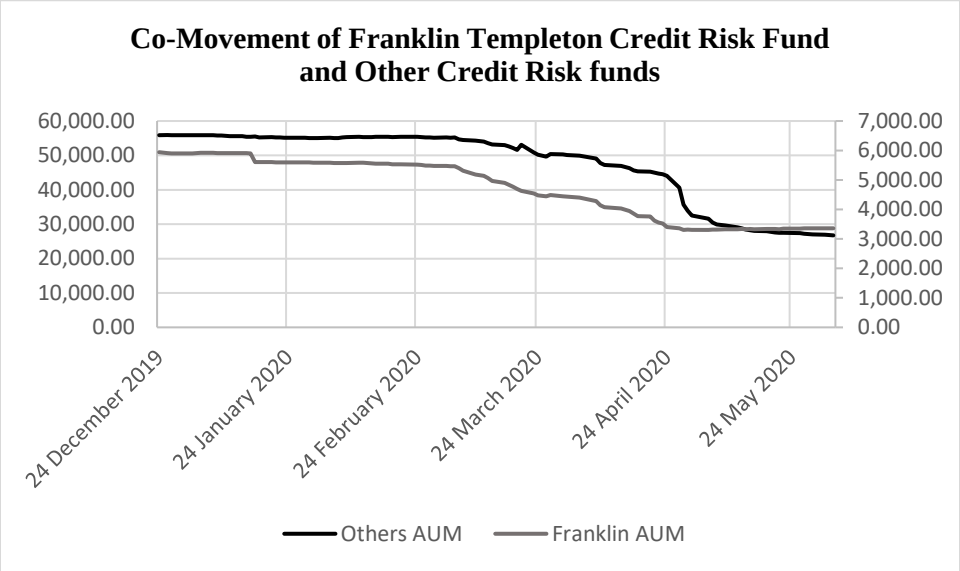


Source: The author

The illustration above depicts an overview of India's credit risk fund network. The pairwise correlation coefficient between funds' assets under management (AUM) (measured in crores) indicates the direction of influence from the source to the target nodes. Each node represents a distinct fund scheme, with the node's size determined by the extent to which it exerts influence over the rest of the network. Correlations between schemes were calculated using daily AUM data from December 2019 to July 2020. As shown in the figure above, the credit risk funds offered by Aditya Birla Sunlife, Axis AMC, Baroda AMC, BOI AXA AMC, Franklin India, DSP AMC, and HDFC AMC have the greatest influence on the rest of the network. Thus, a panic-driven redemption event in any or all of these funds could trigger a chain of redemptions in the fixed income mutual fund segment. This is demonstrated further by the co-movement of daily AUM values (Figure 5) in the aftermath of the Franklin Templeton bankruptcy, which resulted in a chain of redemptions in credit risk funds, the category most adversely affected.

Figure 5: Co-movement of Franklin Templeton Credit Risk Fund AUM and rest of the credit risk funds

The figure represents the co-movement in AUM of the Franklin Templeton credit risk fund (on the secondary axis) and the rest of the other funds in the category. The AUM values are in rupee crores.



Source: AMFI database

The funds in the credit risk fund category witnessed outflows of close to INR 20,000 crores immediately following the closure of six fixed-income and credit-risk schemes offered by Franklin Templeton India on April 23, 2020. This is also visible in a sharp downtrend in the AUM of other funds in the category. The Swing pricing tool aims to tackle the incidence of panic-led redemptions and the possible spread of contagion under extreme events of market distress.

Leveraging the US experience

With nearly 40% of worldwide assets (estimated at $ 23.9 trillion as of March 2022, according to World Bank Open Data) and around 8000 funds spanning a wide range of underlying asset classes, the United States is the world leader in mutual funds. The US mutual funds industry is highly consolidated, with the top three funds (Blackrock, Vanguard, and Charles Schwab) owning a significant portion of assets, totaling $16.3 trillion in assets under management. The asset management industry in the United States is also thriving, with an AUM to GDP ratio of 113 percent, much above the worldwide average of 75 percent.

On the other hand, India has a modest penetration rate, with an AUM to GDP ratio of 14%. However, the low penetration presents an opportunity, as evidenced by the industry's spectacular 300 percent growth in AUM,

which surpassed ₹30 trillion in November 2020 as per the AMFI database. India has brought structural changes such as tax incentives for institutions, formalization of the economy, and a focus on digital investments. Furthermore, the government has taken steps to increase investor awareness. These factors have boosted the availability of investible surplus from institutional and retail investors. The rapidly developing asset management business in India and quicker technology adoption create a strong rationale for drawing on US expertise for regulatory and monitoring initiatives, one of which is planned interventions to control the risk of drawdowns.

Due to the daily pricing of open-ended mutual funds, liquidity mismatches are a frequent concern. However, the assets held by these mutual funds have varying maturities and may not be immediately liquid. A crisis-like situation with multiple redemptions causes a fund to engage in distressed selling. Investor redemptions are honored at the AMCs' end-of-day net asset value (NAV). As a consequence, the fund's liquidation charges may not be fully accounted for, encouraging early withdrawals in the hope that liquidation costs will be covered later.

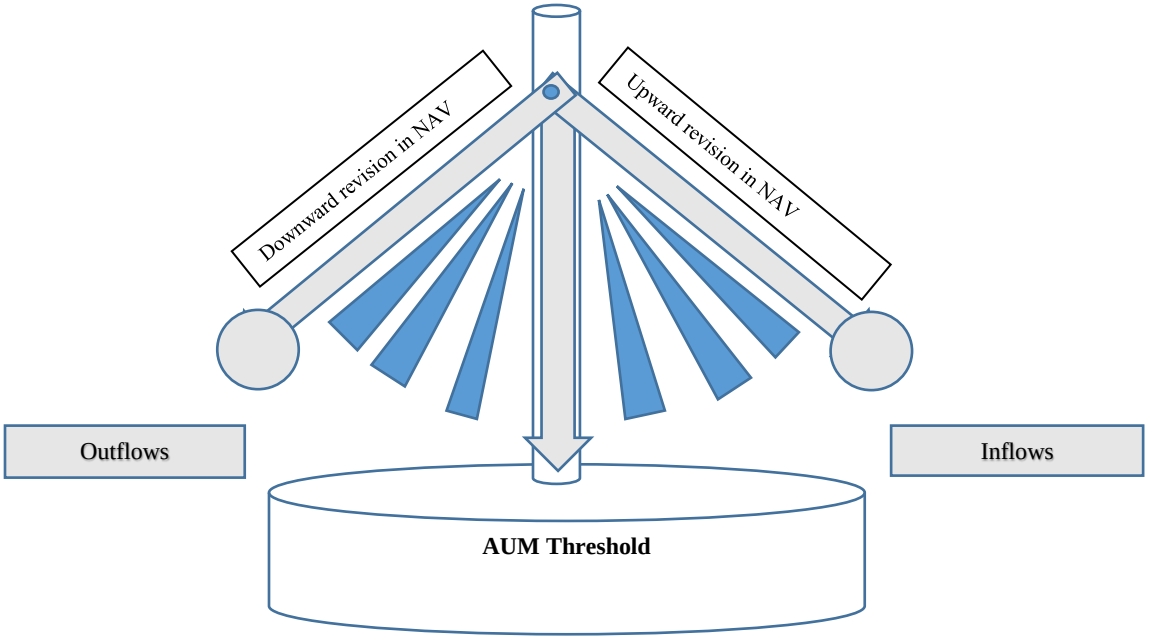
Third Avenue Focused Credit, a junk-bond fund, is a textbook illustration of how first movers create stress and precipitate a redemptions spiral. The fund lost more than half of its original market value between July and December 2015, leading the fund to cease redemptions and liquidate assets in preparation for slow payouts. To safeguard the interests of retail investors, the fund requested the market regulator, the Securities and Exchange Commission (SEC), for interim relief by infusing much-needed liquidity. In October 2016, the US Securities and Exchange Commission (SEC) recognized the impending concerns about labored liquidity management. It announced a modification to rule 22-C, which was adopted in the mid-2000s and allows mutual funds to impose and retain a redemption fee of no more than 2%, in an attempt to address the danger of market timing. The modified rule took effect on November 19, 2018, allowing mutual funds to utilize "swing pricing" under emergent situations.

How does Swing Pricing work?

For more than two decades, swing pricing has been used to safeguard the interest of investors. The system allocates redemption charges among the owners who initiate the trades; thus, it reduces the dilution expenses passed on to existing shareholders. As a result, the advantage of being the first mover is lost, and the risk of larger redemptions is mitigated. Furthermore, a precipitous decline in prices is arrested, and additional economic spill-over is mitigated. Thus, it functions to safeguard the long-term (buy and hold retail) investor's interest from the cost of trading incurred by active investors. Swing pricing can be entire or partial; in full swing pricing, the fund's NAV is updated daily based on the shareholder activity, whereas in partial mode, the NAV is adjusted only when a pre-set threshold is breached. The NAV is modified upwards or downwards in response to the net value of subscriptions and redemption requests to pass on the portfolio re-adjustment cost to investors exiting the funds.

Figure 6: The mechanism of Swing Pricing

The picture above illustrates the swing pricing mechanism, which adjusts the NAV in response to changes in the fund's threshold AUM (net inflows/outflows). The SEBI announced a downward adjustment to the NAV after the Franklin debt funds scandal.



Following the US subprime crisis, the attention on liquidity risk management increased exponentially and led to the inclusion of swing pricing in asset managers' toolkits. Since then, swing pricing has been gradually implemented in the US, the UK, Singapore, France, and Switzerland to deter large redemptions.

We use the Capponi et al. (2020) model of swing pricing and subsequent redemptions to develop the following scenarios in the event of an exogenous shock, such as the COVID-19 pandemic.

$$\delta S_{all}^{sw} = \lambda\left(R_{tot,1}^{fm} + R_{tot,2}^{fm}\right) \quad (1)$$

Equation (1) represents the impact of swing pricing when all funds implement the swing pricing, as notified at the category level by the SEBI. In a hypothetical case of only two funds 1 and 2 with a common asset holding, a total adjustment in the NAV, the swing factor impact, $\delta S_{1,2}$ is given by the aggregate impact of redemptions when the first movers of each fund (1,2) redeem $R_{tot,i}^{fm}$ shares with λ measuring the asset illiquidity.

$$\delta S_{tot,1} = \delta Z \ + \lambda\left[\beta_1 \lambda Z - \frac{(\beta_1 \pi_1 \delta Z)^2}{N_{0,1} + \beta_1 \pi_1 \delta Z}\right] \ + \lambda\left[\beta_2 \lambda Z - \frac{(\beta_2 \pi_2 \delta Z) \ \ (\beta_1 \pi_1 \delta Z)}{N_{0,1} + \beta_1 \pi_1 \delta Z}\right] \quad (2)$$

Equation (2) illustrates the effect of redemptions on Fund 1's value. $\beta_1 and\ \beta_2$ denote the vulnerability of investors in funds 1 and 2 to bad performance. $\pi_1 and\ \pi_2$ denote the proportion of first movers in fund 1 and fund 2. δZ represents the impact of exogenous shock, $\lambda\left[\beta_1\lambda Z - \frac{(\beta_1\pi_1\delta Z)^2}{N_{0,1}+\beta_1\pi_1\delta Z}\right]$ assesses the value impact of redemptions initiated by fund 1's own first movers; while $\lambda\left[\beta_2\lambda Z - \frac{(\beta_2\pi_2\delta Z)\ \ (\beta_1\pi_1\delta Z)}{N_{0,1}+\beta_1\pi_1\delta Z}\right]$ measures the cross-impact exerted by redemptions initiated by first movers of fund 2.

Calculations have implicitly incorporated the effect of endogenous shock and first movers' advantage. The effect of the underlying's credit risk value (CRV) and Macaulay Duration (MD), as mentioned in the SEBI circular dated September 2021, was also not expressly taken into account in the calculations. The following table illustrates an iterative approach based on daily changes in the AUM and NAV of the Franklin Templeton Credit risk fund:

Table 1: An illustrative iteration of the mechanism of Swing Pricing

Incidence	AUM outflows (In %)	The downward revision in NAV (%)	Scenario 1	Scenario 2	Scenario 3
Exogenous shock	4.5% and above	2%	30%	40%	50%
Round 1	3 - 4.5%	1.50%	35%	45%	55%
Round 2	1.5 - 3%	1%	40%	50%	60%
Round 3	1 - 1.5%	0.50%	45%	55%	65%

Note: Scenarios represent percentage reduction in panic withdrawals post-implementation of swing pricing

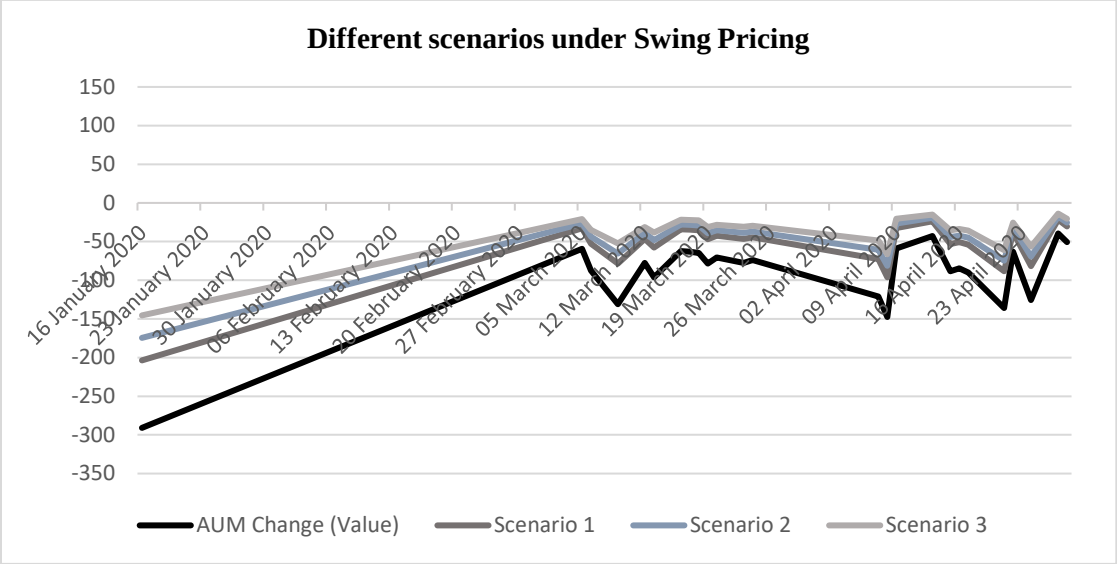
The mechanism of swing pricing has been explained in Table 1 above. The swing pricing mechanism gets activated on the breach of the threshold of a 1% reduction in the fund AUM. The Franklin Templeton Credit Risk Fund witnessed a 4.93% fall in AUM on January 16, 2020, post-pandemic out-break suggesting the first-mover advantage. The SEBI has notified an upper bound of a 2% reduction in NAV for the schemes with CRV less than 10 in the event of extreme market distress. It is assumed that an exogenous shock leading to a ~5% reduction in AUM will attract a reduction in NAV corresponding to the upper bound of the swing factor, that being 2%. The swing factor range 0.5% - 2% has been taken, corresponding to the historical incidence of a fall in Franklin Templeton Credit Risk fund AUM till June 2020. Further rounds of swing pricing have been formulated about the feedback loop model of Capponi et al. (2021), accounting for first movers and second runners. It is assumed that a large reduction in NAV to the extent of 2% post exogenous shock will act as potential feedback in

discouraging further redemptions; hence the likely withdrawal percentages under different scenarios are assumed to be a decline in subsequent rounds.

The mechanism of Swing Pricing: Franklin Templeton credit risk as a case in point

Figure 7: Scenarios of adjustment in NAV and AUM outflows under Swing Pricing

The figure represents expected AUM outflows and NAV revision under different hypothetical scenarios following an exogenous shock like pandemic-led panic redemptions witnessed in credit risk funds. It is hypothesized that an exogenous shock leading to ~5% AUM outflow is likely to be followed by a reduction in NAV corresponding to the upper band of 2%. For illustrative purposes, the threshold for implementation of Swing pricing is assumed at 1% of AUM.



Source: The author

The effect of swing pricing on the likelihood of AUM depletion following panic-driven redemptions is depicted in Figure 7 above. The trend line, AUM change, represents the decline in AUM of the Franklin Templeton credit risk fund following the pandemic breakout (the exogenous shock) and subsequent rounds of panic-driven redemptions in March 2020 (first movers), as well as following Franklin India's announcement of the closure of six schemes (second runners). The Appendix I contains data on the daily AUM and NAV of Franklin Templeton credit risk funds. Scenarios 1, 2, and 3 illustrate the expected impact of swing pricing on the fund's daily AUM data as we back-test the mechanism. Swing pricing (applied to withdrawals of INR 200,000 or more) may be an effective technique in deterring big redemptions, since the cost of large redemptions is passed on to investors (first movers) in the form of a drop in NAV equal to the relevant swing factor (Refer to Figure 7). The tool aids in preserving the interests of retail investors (second runners), who are likely to bear the brunt of redemption pressure-induced NAV declines.

Conclusion

The SEBI has devised various unique liquidity risk management techniques in response to the challenges posed by changing global financial market dynamics. Swing pricing is one such method for protecting retail investors' interests, who are often the second responders to market distress circumstances. Though critically needed, the Swing Pricing mechanism does not come without potential barriers to complete implementation. The first is a declaration of market distress, an event that would necessitate far more rapid action than what may occur under the current architecture. The market regulator can address this with industry stakeholders rather than leaving it to fund boards' discretion. The second issue is with the specific characteristics that affect swing pricing. At the fund level, liquidity estimation for the relevant swing factor, information exchange between funds to assess the impact of the feedback loop, fund disclosure concerning thresholds and the relevant swing factor, and the actual time of plugging in the swing mechanism all need to be carefully planned for successful implementation. Finally, integrating swing pricing into broader fund governance and accounting for contingencies in idiosyncratic market scenarios will be critical to the effectiveness of this crucial tool in protecting investors' interests.

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Appendix I: AUM and NAV data of Franklin Templeton Credit Risk fund (daily values) sorted on the percentage change in AUM.

NAV Date	NAV	FT CR Fund AUM	% Change in AUM	AUM Change (Value)
16 January 2020	19.06	5,609.08	-4.93	-290.91
21 April 2020	18.73	3,621.78	-3.62	-135.86
24 April 2020	18.62	3,400.89	-3.56	-125.66
08 April 2020	18.59	4,137.69	-3.45	-147.73
07 April 2020	18.65	4,285.42	-2.75	-121.05
09 March 2020	18.63	5,182.72	-2.46	-130.88
17 April 2020	18.67	3,772.87	-2.33	-89.98
15 April 2020	18.54	3,947.39	-2.19	-88.34
16 April 2020	18.57	3,862.85	-2.14	-84.54
13 March 2020	18.48	4,964.02	-1.90	-96.16
22 April 2020	18.71	3,558.63	-1.74	-63.15
23 March 2020	18.23	4,547.83	-1.68	-77.51
19 March 2020	18.22	4,695.80	-1.64	-78.31
24 March 2020	18.22	4,473.98	-1.62	-73.85
06 March 2020	18.92	5,313.60	-1.62	-87.67
28 April 2020	18.12	3,310.51	-1.51	-50.89
12 March 2020	18.55	5,060.18	-1.51	-77.65
20 March 2020	18.27	4,625.34	-1.50	-70.46
09 April 2020	18.55	4,078.62	-1.43	-59.07
18 March 2020	18.37	4,774.11	-1.34	-64.62
17 March 2020	18.43	4,838.73	-1.29	-63.11
16 March 2020	18.49	4,901.84	-1.25	-62.18
27 April 2020	18.40	3,361.40	-1.16	-39.49
05 March 2020	19.21	5,401.27	-1.09	-59.46
13 April 2020	18.57	4,035.73	-1.05	-42.89

Source: AMFI database

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Robo Advisor: Emergence, Present Status, and Future

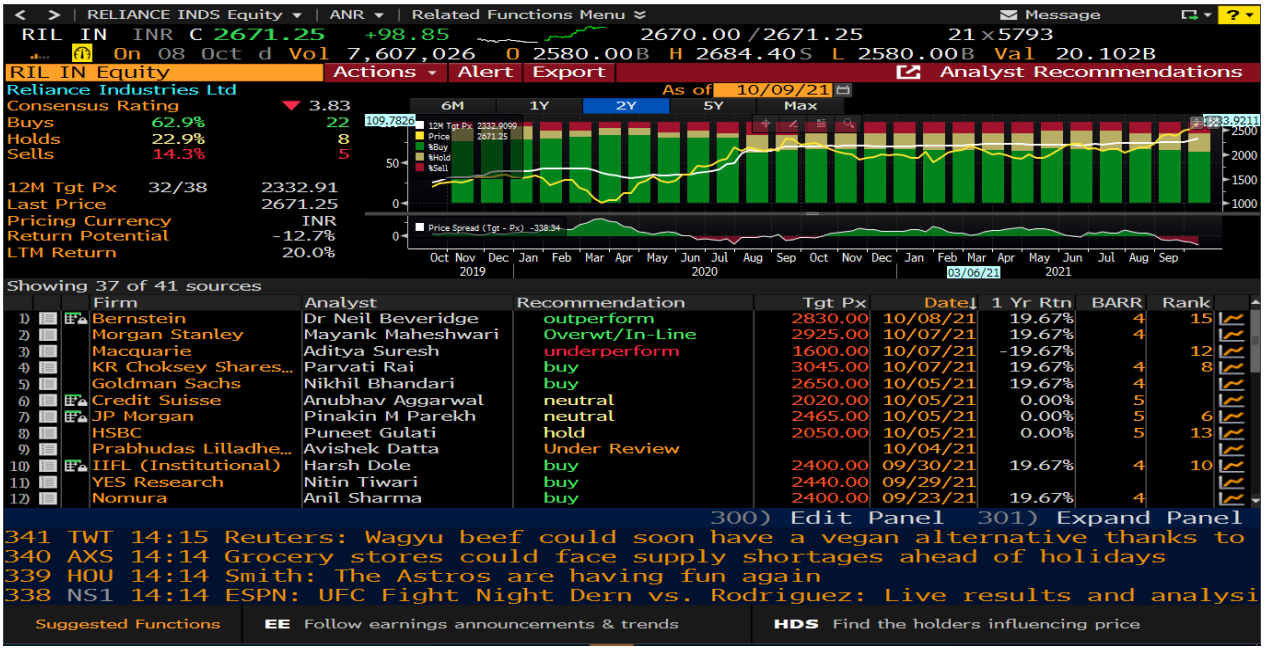
Arti Chandani

Introduction

Technological advancements have changed how we live, and they have impacted our daily life in a big way. We have been living in web 2.0 since early 2000 (O'Reilly, 2009). Web 2.0 is characterized by user-generated content, social network, cloud, etc., which gives rise to a vast amount of data. The field of data analytics emerged out of the data generated daily. Web 2.0 also comprises various technology-driven mobile applications such as Tiktok, WhatsApp, and Instagram. Today, we refer to web 3.0, which is expected to transform individuals, society, business, and government. This transformation is revolutionary and disruptive due to the inherent nature of being open, decentralized, trustless, and incorporating artificial intelligence and machine learning. Some of the cryptocurrencies are part of Web 2.0 and 3.0. Those started during 2.0 have become popular in recent times and have adopted definite characteristics of web 3.0. Technological advancement has touched the financial sector momentously and has given rise to a new era known as, Fintech, which is considered a separate segment. Most of the start-ups in India are coming up in this segment. There are many niche areas within banking and finance, which give rise and opportunity to these start-ups, and Robo advisory is one such area.

Robo Advisors are part of the FinTech evolution which emerged in early 2007-08. Robo Advisors use artificial intelligence and machine learning to advise investors to replace financial/investment advisors potentially. Robo Advisors work on a mathematical algorithm to provide investment advice to their clients and belong to the family of online investment series. Robo Advisors are part of the wealth management industry and work on minimal human interference. Robo Advisors uses an online questionnaire to capture the investor's risk profile, income, family members, number of dependents, expected returns, and other information. This information helps the platform define the risk-return profiles of the investors. Robo Advisors allocate and manage client funds to generate superior returns based on the client's risk-return profile. Robo Advisors are also known as Digital Advice Platforms and Automated Investment Advisors. There has been a surge in these platforms recently. Much research has been carried out to find the user perception and expectation from these services to make these services widely available.

Figure 1: Analyst Recommendation on Reliance Industry Ltd. On 09.10.2021



(Source: Bloomberg)

Financial advisors are subjective to various criteria. Therefore, their recommendation may not be the same as seen in Figure 1, where some analysts recommend a Buy recommendation, whereas others provide a Neutral, Outperform, Hold, or Underperform recommendation. Analysts have various biases that affect their stock recommendations and impact investor behavior. Robo Advisors are not affected by these behavioral biases. Consequently, they have an edge while recommending assets to the investors. Using their proprietary algorithm and investor risk profile, they suggest investments. As a result, there would be neither behavioral bias nor a different recommendation for a single investor.

Robo Advisors can provide one-time investment advice and help in portfolio rebalancing. Portfolios are designed based on investor risk-return profiles and portfolio theories. If there are changes in the portfolio due to movement in the index, Robo Advisors can rebalance the portfolio within no time to achieve the target portfolio.

Financial advisors take around 1%-1.25% as their fee. In contrast, Robo Advisors charge as low as 0.25%, and they can extend their services to a larger client base than what Financial Advisors can. The reach of Robo Advisors can be extensive as it is system-driven. In contrast, Financial Advisors have a limitation as they can serve only a limited number of clients and investors at any given point in time. The mobile phone penetration will also help grow Robo Advisory services as these platforms will cater to the client requirements through a mobile application.

History

Betterment was the first Robo Advisory firm founded in the 2008 financial crisis in the USA. Subsequently, the number of Robo Advisors globally has increased substantially, and their Assets Under Management (AUM) have also been growing at a higher rate.

As per the data from Statista, in 2022, the AUM is expected to be $1.787 trillion globally for Robo Advisory services, while the figure stands at $ 16.912 billion for India.[1] The size of AUM for Robo advisory is expected to be $2.842 trillion globally by 2025. The Compounded Annual Growth Rate (CAGR) of AUM is 16.72% globally and 35.02% for India between 2022 and 2025.[2] USA dominates the position in terms of having the highest AUM for the Robo Advisory segment globally.

India has a demographic dividend, and many investors are young, leading to a big market for Robo Advisors. These investors are tech-savvy and would want to invest without the middleman or Financial Advisors. These investors prefer the DIY (Do-It-Yourself) strategy instead of taking the financial advisor's services.[3] . The demand for an ever-increasing market for Robo Advisory services in India will emanate from these young tech-savvy investors.

Features of Robo advisors

Robo Advisors are cost-effective, easy to use, and provide secure platforms enabling investors to increase their return and reduce their risk. These Robo advisors are available on multiple platforms such as desktop, laptop, mobile, tablet, and are available 24 x 7 while no Financial Advisor can be available all the time. The machines will reach a larger population due to the scalability at very economical rates. The Robo Advisors can also track the investment priorities of the investors and advise their clients and investors, which is not prone to human bias. Some Robo Advisors can provide comprehensive services, including financial planning, retirement planning, and tax planning. Most Robo Advisors use modern portfolio theory to design portfolios for their investors (Beketov et al., 2018), while few smaller ones use sample portfolios and constant portfolios.

Robo Advisors have certain drawbacks, one of them being the lack of human interaction. Often, investors want to seek the opinion of a Financial Advisor as they feel more comfortable talking to a person rather than only

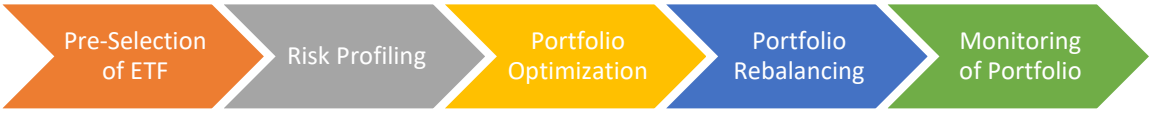
[1] https://www.statista.com/outlook/dmo/fintech/digital-investment/robo-advisors/india?currency=usd, extracted on 13.02.2022

[2] https://www.statista.com/outlook/dmo/fintech/digital-investment/robo-advisors/worldwide?currency=usd, extracted on 13.02.2022

[3] https://www.businesstoday.in/magazine/markets/story/hello-robo-how-robo-advisory-firms-are-revolutionising-financial-services-in-india-308232-2021-10-08, extracted on 14.02.2022

making investment decisions through a machine. At present, Robo Advisors do not cater to all financial assets. They provide service limited to specific assets, which can be considered a limiting factor. Robo Advisors also require that the investors use technology and be tech-savvy. However, this does not seem to be a significant constraint as smartphones and mobile applications have made these things much easier these days.

Figure 2: Process of Robo advisors



(Source: Beketov, et al., 2018)

A typical Robo Advisor first collects and selects some assets, representing the investment asset in which an investor would be keen to invest, considering the risk and return. After this, clients or investors fill up the questionnaire, which helps the Robo Advisor to understand the investor's risk profile. The questionnaire may include questions related to income, investment, loans, number of dependents, inheritance, past saving, and future goals in terms of child education.

These answers help assess the investor's risk preference basis on which portfolio allocation is made. Modern portfolio theory is used in the background while selecting the portfolio. Most Robo Advisors can rebalance the portfolio once the threshold is breached due to movement in the market. These thresholds are decided based on the risk profile of the investor. The last step is to monitor the portfolio based on the investor's risk preference and ensure that returns are generated for the investors.

The present state of Robo Advisors

Some Robo Advisors started as early as 2008-2010; however, the term "Robo Advisors" did not exist. The Robo Advisory companies were there to provide investment advice with the help of technology in the wealth management space, which later came to be known as Robo Advisor. More than 200 Robo advisory firms are in the USA, with Betterment, Wealthfront, and Personal Capital being the biggest of the lot. Today there are more than 85 Robo Advisory firms in India, and more than 58% of the Robo advisory firms are located in Mumbai and Bangalore. Some of the well-known and popular Robo Advisors are 5paisa.com, ET money, Fisdom, Funds India, Prime Investor, Finedge, and Money Frog. Few Robo Advisory services are more than 15-year-old. However,

those were not known as Robo Advisors during that time, but today they are referred to as Robo Advisors. Few Robo Advisory services provide only fund-based advisory or equity-based services, while the others offer comprehensive Robo Advisory services.

Robo Advisory services are regulated in the respective countries and should meet the regulatory requirement of the Wealth Management Professionals. However, there is a greater need for better control, surveillance, and supervision of the Robo Advisors. They will help build the trust and confidence of the investors and eventually strengthen the market participation of the investors. The designing part of the Robo Advisory platform might be subject to regulatory requirements. The design part of the platform provides advice, makes decisions, allocates assets, and rebalances portfolios.

The customization is the challenge in the present form, although each investor fills out a form that helps the platform to ascertain the investor's risk appetite. Financial Advisors provide customized advice to the investor, and Robo Advisors also provide customization advice which is much more basic and less specific to an investor.

Named Robo Advisor vis-à-vis unnamed Robo Advisor: participants were more receptive to the designated human advisor's advice than the unnamed human advisor. At the same time, the scene is entirely different, where participants were more receptive to the suggestion of an unnamed Robo advisor than the named Robo advisor (Hodge et al., 2021). Robo Advisors are an intermediary between market and consumers for affordable and customized financial advice (Baulkaran and Jain, 2021)

Future

It is a fact that institutional investors and ultra-high earners require much more complex advice than individual and retail investors.[4] As per a survey conducted by the CFA Institute, institutional investors and ultra-high earners are not likely to be affected by the Robo Advisors and are more likely to continue with Financial Advisors. Retail investors are numerous but have less investible funds. In contrast, institutional and ultra-high earners may be few but have significant investible funds and higher volume. Consequently, Robo Advisors must be able to accommodate both on their platforms. A report of Deloitte shows that few Robo Advisory firms have reached the stage of 4.0, where the investments are fully automated, and algorithms are self-learning. 80% of the UK, USA, and German companies have 3.0 capabilities, and India would lie between 2.0 to 3.0. [5]

[4] Available at : https://www.cfainstitute.org/en/advocacy/market-integrity-insights/2016/04/survey-ultra-hnw-institutional-clients, extracted on 02.02.2022

[5] Available at : https://www2.deloitte.com/content/dam/Deloitte/de/Documents/financial-services/Deloitte-Robo-safe.pdf, extracted on 28.01.2022

It is interesting to know that some of the Financial Advisors are moving towards Digital Solutions to provide services to their clients efficiently, signalling the presence of the hybrid model. The wealth management firms have started incorporating Robo Advisory within their present advisory models to service their clients efficiently. The banks and wealth management firms will adopt the innovative technology within their operations, and Robo Advisory will become part of their offering in the future (Uhl and Rohner, 2018). Robo Advisory service usage depends on a customer's perceived ease of use and privacy (Seiler and Fanenbruck, 2021).

Conclusion

Technology has made things available at our fingertips, whether watching movies, ordering food, making video calls, online shopping, among others. Online investment is one such significant contribution of technology. Today we not only buy stocks and other financial assets online, but we are also able to get advice online now. The Robo Advisors are capable of providing investment advice to the investors, at the time when they want, in a cost-efficient manner. Moreover, those pieces of advice are free from human error or bias as those are driven by algorithms. At the same time, Robo Advisors cannot provide human touch and emotional support to the investor, which is very much needed by some in the bear phase of the market cycle. The investors are more comfortable talking to Financial Advisors if the financial assets are not performing as per their expectations. There are certain times, especially when the investors have lost money, notional or otherwise, and they would like to talk to the Financial Advisor, which is not possible in the case of Robo Advisory services.

There is a greater need to create awareness of the Robo Advisory services among the investors. There are multiple ways to do this, such as conducting investor education programs, seminars, and workshops. Another way could be to reach out to the various corporates and run an awareness campaign for their employees. Also, there could be an opportunity to reach out to various post-graduate institutions to spread awareness about investment among students who will soon be joining the workforce and will have an investible surplus.

Robo Advisory services can reach the lower strata of society and help in financial inclusion as the mobile application is effortless to use and understand. Accuracy of the advice and its suitability for the clients are the two critical aspects for clients to adopt these services (Kaya et al., 2017).

Technology can replace repetitive or computational tasks, but it is not easy to replace the subjective and human elements. Still, it will be helpful to those investors who are exposed to a potential conflict of interest in the case of Financial Advisors. We have many examples from the finance domain where technology has brought change but has not replaced humans, mobile banking, internet banking, etc. Robo Advisors are here to stay but not replace

human or Financial Advisors. We will witness the co-existence of the Robo and Financial Advisors, which can be considered a new normal in the wealth management space.

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Regulatory Sandboxes in FinTech: Existential Need or Overhyped Appendage?

Aabir Acherjee

The FinTech sector in India has shown tremendous growth, with it being one of the fastest in the world. There are around 2100 FinTech companies in India, with the bulk of them (almost 67 percent) having been set up in the last five years. The current valuation of India's FinTech companies is USD 31 Billion, which is expected to nearly triple to USD 84 billion by the year 2025 (InvestIndia 2021). More than 50 FinTech companies are valued at greater than USD 100 million, covering a wide array of areas such as broking, insurance, and software as a service. One key growth sector has been neo-banking, with almost 15 companies vying for that space.

Opportunities and Issues in the FinTech sector

Several factors have spurred the phenomenal growth of the FinTech industry. These include a growing start-up ecosystem, increased penetration of smartphones, and an ever-evolving infrastructure supportive of digital transactions. There has also been a significant push by the current government towards the Unified Payments Interface (UPI) and associated technologies, which have further acted as catalysts in FinTech growth (InvestIndia 2021).

But all is not smooth for this sector. Some areas need immediate redress. The primary pain points are regulatory and compliance laws, unbanked and under-banked population, trust in cash, cyber threats, lack of government support, and complexities unique to the industry such as unbundling and collaboration (Dayal and Narayanan 2021).

Out of these parameters, regulation and compliance are a game-changer. An efficient regulatory system can increase this sector's efficacy manifold and further accelerate growth. The current regulatory ecosystem has been hampered by the involvement of multiple entities such as the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI), the Telecom Regulatory Authority of India (TRAI), and the Insurance Regulatory and Development Authority of India (IRDAI). The lack of a unified body leads to redundancies and functional issues. Furthermore, the contrasting view of respective states on start-ups increases the complexities. Given the inherent challenges discussed above, a focussed look into regulatory sandboxes is warranted.

Regulatory Sandboxes

A sandbox allows FinTech organizations to test new service offerings, assess their risks, and create an additional buffer between the market and the end consumers, thus reducing adoption risk (Dayal and Narayanan 2021). An ecosystem like this allows a collaborative atmosphere for FinTech and refinement of offerings based on customer needs.

Regulatory sandboxes fulfill several objectives. They provide a closed environment for testing products in FinTech. Furthermore, they enable the creation of new business models unprotected by regulations. They also aim to balance compliance and financial regulation during the design and launch of new financial products. Finally, they act as a catalyst for creating an ecosystem that fosters innovation while insulating the consumers from the inherent risks of new products.

Assessing Regulatory Sandboxes

In the regulatory sandbox, a contained space is provided to contestants and challengers experimenting with designs that lie outside of the active regulatory structure. The initiative of this framework started in the information technology sector, where new stuff is examined, and the database is secluded from the critical system resources (BakerMcKenzie 2020). However, sandbox test products that are already live.

The regulatory framework allows financial institutions and industry leaders to do live experiments with financial products and services. Consequently, they can identify likely problems and thus mitigate future risks. As a result, businesses can test innovations and concepts with consumers under specific oversight (WorldBank 2020). The sandbox includes appropriate safeguards to contain the consequences of failure and maintain the financial system's soundness. Notably, the sandbox is anticipated to support and assist the positive discourse between the regulator and what is regulated. Across the world, many nations have agreed to sandboxes, and at present, 46 initiatives are implemented in different stages (WorldBank 2020).

The concept could be mapped out to the U.S. Project Catalyst. It was a program formed by Consumer Financial Protection Bureau in 2012 for encouraging customer-friendly improvement and start-ups for financial services (BakerMcKenzie 2020). The program is an important extension of the Consumer Protection Act and Dodd-Frank Wall Street Reform, providing consumers with clear, spirited, and modern marketplaces.

The U.K.'s Financial Conduct Authority (FCA) recognized the modern regulatory sandbox in 2015. It called the framework a safe place for companies to test new products, trade concepts, models, and services and to deliver optimal results without incurring standard regulatory costs. Of the 99 companies that applied for FCA's fifth cohort in 2019, 29 were accepted, including small start-ups and established banks (InvestIndia 2021).

Regulatory Sandboxes in India

In 2016 RBI initiated an inter-regulatory functioning team to look at the new and finer aspects of FinTech. RBI also released guidelines for the sandbox in August 2019 after the suggestions made by the working group. Furthermore, both the SEBI and the IRDAI have announced their plans for regulatory sandboxes. The SEBI regulates India's securities markets, whereas IRDAI regulates the insurance and re-insurance sectors (Dayal and Narayanan 2021).

Maharashtra already has policies for encouraging financial start-ups. The government launched a sandbox exposing bank application programming lines to endorse open banking proposals. Several private bank institutions, such as ICICI Bank, YES Bank, and HDFC Bank, have an initiative where programmers and developers are asked to create a new application through banking APIs (BakerMcKenzie 2020).

Indian regulators decided on a diverse approach compared to the U.K.'s FCA sandbox. For example, the FCA sandbox allows testing for the products in different sectors such as Know Your Customers (KYC), debt, insurance, and securities. On the contrary, Indian regulators promote new concepts through premeditated sandboxes for each division. However, sandboxes in India are currently in an emerging period as Indian regulators are still standardizing the regulations.

IRDAI's Regulatory Sandbox

IRDAI is tasked with licensing and regulating India's insurance and re-insurance sectors. It looks at products and services in the insurance sector and has a separate section for reviewing requests. According to IRDAI's plan, any application willing to promote and bring innovation in insurance can enter the program. Though, it requires a demonstration of the new invention to the regulators. There is no detailed test period, but it ends when the number of customers reaches 10,000 or when the insurance premium reaches INR 50 lakh (Dayal and Narayanan 2021).

Global perspective

It is essential to delve into some established international structures to understand the regulatory sandbox better. Three different countries – China, the U.K., and Australia – have been chosen for a deeper analysis to comprehend the functional aspects of such a setup.

FinTech regulation in China

China's central bank has strengthened the regulation of the payment sector and requires all companies to be licensed to provide financial services. According to the Governor of the People's Bank of China, China's approach to regulating financial businesses is grounded on three principles: businesses must be licensed; companies

providing wealth management and insurance must set firewalls to prevent cross-sector risks; and the direct link between banking information services and non-banks must be cut.

China has been taking a series of recent measures on FinTech regulations. It passed a new law on personal data protection in August 2021 and issued a data security law in June 2021. Furthermore, it has tightened its grip on non-bank payment providers by restricting their activities (Xin 2021).

The United Kingdom

The U.K. Financial Conduct Authority's (FCA) sandbox has an opening for both authorized and unauthorized firms across technologies and businesses. Since its inception, the sandbox has been extremely popular with applicants from multiple sectors, which is reflected in the increasingly diverse nature of the FinTech industry. Examples of such organizations are firms involved in digital identity solutions, platforms that tokenize financial instruments, and services that facilitate greater access to financial services for disadvantaged consumers. Also, blockchain technology is widely used in many firms, consistent with the growth of DLT (Distributed Ledger Technology). Some examples of its applications are automating debt and equity issuance, developing identity verification services, and creating products for cash flow management.

The U.K. also has a set of standards that must be followed strictly. The sandbox is primarily intended for testing on a small scale, and there are strict limits on the size of tests. The customer sets should be big enough to generate actionable and coherent data. This should be done by ensuring that two parameters are in place. One is the management of risks for consumers, and the other is the practical aspect of obtaining consumers for this period. In addition to this, some additional safeguards must be fulfilled and are largely sector-specific. For example, retail consumers should not be a party to any risk during sandbox testing. As for the sophisticated consumer base, the compensation may be limited subject to the availability of informed consent. Certain cases require a U.K. bank account for enlisting in sandbox testing. If there is a requirement for a partner or third party for testing purposes, adequate contractual agreements need to be in place. The testing plan needs to be comprehensive and should meet several criteria. One criterion is the presence of a concrete plan for the timeline involved. The second criterion is key milestones for testing. Some of these are duration and transaction limit. The third one is safeguarding for customers, whereas the fourth criterion is an exit strategy. These must be laid out in detail and comprehensively before sandbox testing begins.

The process in the U.K. has not been without its fair share of challenges. The FAC has identified several obstacles from participants in a sandbox. One main concern flagged by participants is the difficulty of obtaining banking services. This issue is applicable for firms that are into leveraging DLT (Distributed Ledger Technology) or are becoming payment institutions. Acquiring a new customer base is an issue faced by start-ups. One

recommendation by the FCA is to set up partnerships between established firms and start-ups. There is also an admission by the FCA that meeting the threshold specifications for start-ups is tougher when compared to traditional organizations. This can be attributed to two factors. One is scale, and the other is the FCA's inability to comprehend the functionalities of these newer organizations. These issues have impacted the reach and efficacy of the regulatory sandbox setup.

FinTech regulation in Australia

The Australian Securities and Investment Commission (ASIC) revealed its first iteration of sandbox in December 2016. Any eligible FinTech company can apply for it after notifying ASIC of its intent to propose products and services within sandbox regulations (BakerMcKenzie 2020). No other approvals are required. However, the timing of the release and restrictive parameters of the sandbox has resulted in limited participation.

Trans-governmental attempts to facilitate cooperation among regulators

One of the best examples of trans-governmental cooperation among regulators can be seen in the case of the E.U. (European Union). In the context of current discourse, the study of this initiative attains great relevance. The risk of market fragmentation primarily accelerated this cooperation. This cooperation was also compounded by potential difficulties in scaling and deploying innovative products across the E.U. market (Allen, 2020). The group of experts on “Regulatory Obstacles to Financial Innovation” recommended the creation of a pan-E.U. regulatory sandbox. While the intricacies of such a cooperative effort are time-dependent, it brings the concept of such a positive symbiotic existence to the fore. Arrangement of cross-border testing between nationally operated sandboxes can accelerate product market penetration and make it more attractive as a business destination.

Some of the proposed aspects to be covered under this cooperative framework are: Circumscribed scope in granting permissions for multilateral trading facilities and securities settlement systems; Limits and safeguards for consumer and investor protection, market integrity, and financial stability; Creation of a harmonized framework from which national authorities can grant exemptions and take alternative measures; Specific permissions to be valid across the European Union for a time-limited period.

GFIN (Global Financial Innovation Network)

This group includes several countries, such as Australia, Abu Dhabi, and the U.K. Some of the other jurisdictions involved are Bahrain, Dubai, Guernsey, Hong Kong, and Singapore. Canada’s AMF (Autorité des marchés financiers) and OSC (Ontario Securities Commission)**,** along with twelve other regulators, have proposed the creation of this group for the formation of a single Global Financial Innovation Network (GFIN).

This body aims to foster existing collaborations, speed the process of information sharing, and create easier approach mechanisms for regulators in foreign jurisdictions (BakerMcKenzie, 2020). Better relations would translate to more compatible forms of regulation and thus lead to greater advantages in operation. Some areas of benefit would be new product development, counter-terrorist financing, payments, and financial crime. This framework would allow firms to test their ideas and products across multiple geographies and gain real-time insights. It would also ensure a well-rounded feedback loop, making the products more robust and suited to consumer needs.

Rule-based or principle-based sandbox: pros and cons

There has always been a moral debate regarding the approach to be adopted over any regulation. Two divergent approaches form a part of this paradigm. One is a rule-based approach, and the other is principle-based. The current FinTech market is technology-driven, with innovations fast outpacing existing rules. So, the regulations need to be in tandem and complement growth (Dayal and Narayanan 2021). But, a closer look presents a garbled picture. The FinTech market is highly regulated by rules in India, and that too by multiple agencies. This has driven the market towards a highly contained rule-based regimen (InvestIndia 2021).

Now, let us take a comparative look at the rule- and principle-based approaches. The rule-based approach is highly rule-based in nature and constitution. There is a detailed set of directives set by the regulator and a clear structure for functioning, with explicit functional parameters. This creates a scenario where the companies follow the law in letter but not in spirit. But an inherent flaw in this regimen is its lack of flexibility. So, there is a higher probability of industry changes outpacing regulations. i.e., technological changes outgrowing regulations, as pointed out earlier.

A principle-based approach, on the other hand, is much more flexible. There is a focus on intended outcomes, while parameters, such as laws, measures, and procedures, are left to individual participants of the ecosystem (BakerMcKenzie 2020). Although there is more space in functioning for constituents, it has drawbacks such as inconsistent implementation, uncertainty over the optics of control, and the requirement of high skills for ensuring intended outcomes. A common issue faced by FinTechs is the lack of access to all UPI systems due to strict control on access and KYC rules. This lack of access creates an uneven ground for players and hinders implementation. It is an agreed adage that rules should shadow business models, not vice versa. So, it is well-advised that India adopts a more principle-based approach to regulating FinTech.

Another interesting factor that needs to be considered is culture. All sectors function within a socio-economic space that is well constrained and tempered by culture (InvestIndia 2021). Let us explore this further. India scores

relatively low uncertainty avoidance (40) when examined under Hofstede's cultural dimensions (Hofstede Insights, 2021). This index is an indicator of a country's socio-cultural inclinations and makeup, thus serving as an essential tool for businesses in understanding it. This means that culturally India prefers less rule-orientated systems. Flexible structures are more suited for the Indian ecosystem.

Regulatory sandboxes – concluding thoughts

Many countries like France and Germany have adopted regulatory sandboxes with great zeal. On the contrary, one of the early movers like Singapore used sandboxes only as a last resort. It has to be reiterated that Regulatory sandboxes are not a standalone solution. They cannot replace permanent directives or regulatory frameworks. Regulatory sandboxes are enablers, and their application should be targeted and specific. It has to be used as a temporary measure to achieve objectives as a part of a broader policy.

Some recommendations can be suggested for making regulatory sandboxes more effective. There has to be a higher degree of harmony among regulators like RBI, SEBI, and IRDAI to reduce the current system's complexity. There is a need for capacity building with full-time resources. A formal knowledge-sharing platform can accelerate the positive impact of regulatory sandboxes in a country like India. A sandbox, by itself, is not a substitute for an effective and permanent regulatory framework, nor is it a magic bullet.

Sandboxes are a precious tool in the right setting, and they facilitate the industry by providing a broad strategy set. They further empower FinTechs with empirical data. It is vital for countries like India, with a young and burgeoning middles class. A data-centric approach shall ensure higher penetration among the population, thus easing credit requirements and ensuring fluidity in the market. Regulatory sandboxes provide the policymakers with a strategic framework in a highly volatile and risk-laden industry like FinTech. Although not a one-stop solution, it is a stop worth exploring.

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