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Indian Institute of Management Calcutta

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*Note: The views expressed by the authors in their articles published in this issue of Aṛṥtha are personal and do not necessarily represent the views of their employers, or that of Aṛṥtha, FRTL, and IIM Calcutta. Authors are responsible for any permission needed for the copyrighted materials used in their article.*

# Editorial



It is my pleasure to introduce you May 2023 artha edition. Artha, as a peer-reviewed e-Journal, has attracted attention from academicians and practitioners, which is reflected in the increased number of subscriptions and articles submitted for publication. In the current issue, we are publishing seven articles covering a variety of topics from Accounting, Finance, and Governance.

*The first article, "Using Recent News and Mapping to Teach Real Estate Finance,"* discusses the importance of using news articles with text books for more active learning in this UCVA world (Volatile, Uncertain, Complex, and Ambiguous). The author cited several recent cases to discuss the new challenges faced by Real Estate and how these cases may be used in the course curriculum for effective learning. In the *second article, "Going Back to Managerial Capitalism – Not a Retrograde Step,"* the author discusses the changes in the business environment in the 21st century and presents a modest proposal for changes necessary in the corporate governance structure. The author emphasizes the requirement of an advisory board model instead of a monitoring board system to bring more efficiencies in the corporate governance structure and the performance of firms. The *third article, "Blended Finance: Unlocking Commercial Finance for Sustainable Development,"* emphasizes the need for blended finance to achieve Sustainable Development Goals (SDGs) and to meet climate finance needs. The author discusses the approaches to blended finance and the future road map of blended finance. The *fourth article, "Well-connected directors: When do they really matter?"* discusses the evolution of the role of directors in the changing corporate governance structure. It also discusses the impact on the corporations' performance if directors occupy multiple board positions. The *fifth article, "Renewable Energy Financing in India,"* provides an overview of renewable energy financing and its current status in the Indian scenario. The author also discusses the public policy initiative that needs to be taken to achieve the desired goals. The *sixth article, "An analysis of the Volatility of Indian Defence Stocks Using Bollinger Bands,"* discusses the government's initiatives to manufacture defence equipment in India as a part of its "Make in India" campaign. The author also analyses the volatility of five stocks in defence sector using a technical indicator – Bollinger Bands. The *seventh article, "Dominance of Automation in Financial Services Industry,"* discusses the transformation of the financial services industry driven by the dominance of automation. The article discusses the impact of artificial intelligence (AI), machine learning (ML), and robotic process automation (RPA) in improving customer services, bringing more efficiency to the financial services industry, and in risk management.

I hope that you will enjoy reading all articles. I sincerely thank the authors who have contributed to this issue, and I expect that you will consider Artha for publishing your article. You may send your articles, and feedback to us @ [artha@iimcal.ac.in](mailto:artha@iimcal.ac.in).

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Chief Editor

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# Using Recent News and Mapping to Teach Real Estate Finance

**Arvind Ashta**

The Real Estate industry employs millions of people in developing, servicing and managing land and buildings that comprise two-thirds of global real assets or net worth (Woetzel et al., 2021). Investing and financing this real estate is therefore an important topic for business students. A course in real estate finance would include subjects such as whether one should buy property or rent, real estate valuation to determine a good price, sale and lease-back to finance emergency-time needs, whether real estate should be a part of your portfolio investment and if so how much, how to finance your real estate investments, whether you should invest in commercial real estate or housing, how to finance the development of real estate, the different forms of real estate ownership and their tax implications, and of course risk management. Different textbooks would have different ways to organize these and other topics (Brueggeman and Fisher, 2011, Sirota and Barrell, 2015). Finance textbooks may or may not have a chapter dedicated to real estate finance but usually provide examples that include this sector (e.g., Brealey et al., 2017).

Most of these topics could be detailed further in a topic map. For example, real estate values may include the income method, market comparables, replacement cost, and computer modeling with different estimates of net present value and internal rate of return. Similarly, the question of where to invest would also be determined by whether you're taking an institutional investor's viewpoint or a personal investor's viewpoint. For sectors of real estate, probably a different analysis is required for office complexes, retail complexes, industrial complexes, hotels, or residential apartments. For investment funds, the question that can be posed is who is going to manage your fund: is it very focused managers or more general managers? More financial issues that could be covered include the extent of leverage, the duration matching, the timing of investment, and the nature of interest (fixed or variable). Similarly, for real estate development, the importance of trying to get municipal support for developing affordable housing or for commercial property needs to be explained. Real estate educators need to keep in mind that more and more, getting municipal financing or regional financing would require constructing environmentally friendly buildings. Probably, there may be a need to construct many different scenarios and simulate the income possibilities from these before deciding on what kind of real estate development one may want to do on a particular site.

The large number of possibilities indicates that there is a risk of not making the optimal decision. Combining these possibilities with probabilities, one could do different kinds of scenario analysis, sensitivity analysis, and what-if analysis. These scenarios could take into account some common concerns such as the interest rate risk and portfolio risks, the effect of inflation and recession, tax changes, foreign currency risks, geopolitical risks, and sector over-investment. For emerging markets, there would be additional risks coming from a lack of clear titles, institutional voids, and far greater information asymmetry. These risks also arise from the broader opportunities and threats in the environment: for example, population increase, emigration or immigration, urbanization, economic growth and recessions, the fight for decarbonization and green certification, safety regulations, and technological changes. In a world of increasing volatility, uncertainty, complexity, and ambiguity (VUCA), textbooks are not sufficient to understand and appreciate these recent opportunities and threats. There is a need to update knowledge through the reading of newspapers and transmit new concepts to students to reinforce and update their textbook learning so that they enter the business world adequately prepared.

This article presents a few recent cases, taken from financial newspapers, which illustrate many different aspects of real estate finance and see how these cases could be used for teaching different aspects of a course. For teaching complex relationships, it is suggested that students engage in mapping. To illustrate this, some recent news items affecting the real estate sector will be analyzed using concept mapping. My classroom teaching for financial subjects indicates that students prefer making mind maps rather than concept maps, while I would prefer them to see relationships and not just associations. This article focuses on some of the larger cases which have taken place recently including Evergrande in China, Blackstone in the United States, the state of the industry in Europe, and safety certification in Turkey. It also looks at the opportunities created by technological changes such as blockchain development and how it may contribute to financing real estate and managing its risks.

### **A short note on mapping**

To understand the above-mentioned cases, which may seem complex to neophytes, I will use mapping. Mapping is a form of active learning: learning where the student is not a passive recipient of knowledge but rather perceives it through active engagement. Active learning increases the confidence of students in expressing opinions, the ability to work in teams, and self-learning, in addition to deepening knowledge and elaboration of knowledge (Healy and McCutcheon, 2008). Mapping refers to lines drawn between different nodes to show that they are linked. This technique has been used for centuries as a way for people to record the link between subjects. However, it has been formalized in the 1970s with terminology such as topic maps, concept maps, and mind maps.

Topic maps would be used by instructors to indicate the various topics in their course and a hierarchical link between these topics.

Concept maps are used to denote the link between concepts. While a traditional formal concept map may be hierarchical going from the general to the specific (Novak and Cañas, 2006), it is now accepted that there are a large variety of concept maps (Ahlberg, 2004). I use them in a sort of free-form exercise which then helps students understand relationships between concepts. Typically, concept maps have arrows indicating the direction of the relationship. At least, this is how I use them in my teaching.

These are slightly different from mind maps, that have been developed to describe the association between different concepts (Buzan and Buzan, 2002, Buzan, 2006). In mind maps, usually, there is a central concept or a node, and the other concepts are linked to this central concept. Some of the other concepts could also be related to other concepts and this would then create other nodes. Typically, mind maps do not have arrows indicating the cause-effect relationship. My experience shows that students are quickly able to create mindmaps when reading news items, but they do not take the time to look at the cause-effect relationships.

Any kind of mapping exercise involves active learning, facilitating learning and retention. Moreover, there is a socialized context since the newspaper article that I provide is a social object. Finally, I divide students into groups and provide each group with a news clip that they need to summarize in one slide. They usually have thirty minutes to do this, at the end of which they have to provide a one-minute presentation to the class on the creation. Students invariably use free software on mind maps for their creation. If time permits, I then show them the concept map that I created for the same news article(s).

In this article, I will show examples of concept maps that I could use to teach a course on real estate financing, based on newspaper articles. While I have taught courses linked to the financial environment, I have not covered real estate finance. The cases selected below illustrate the diversity of real estate financing.

### **Evergrande: over-using leverage to grow too fast**

The most interesting case to illustrate the bankruptcy impact of taking too much debt and growing too fast is Evergrande, in China. The Urbanization of China with workers coming into cities, led to a huge demand for housing, evidenced by high price rises. To cater to this demand, real estate developers such as Evergrande, took loans to build houses. They were encouraged by municipalities that needed to sell land to have revenues. From the 1990s till 2010, a significant engine of Chinese growth was the property market. As a result, both home buyers and construction agents felt secure that the market was too important to fail. Risk perception was low.

In 2020, the Chinese government became worried about the over-indebtedness of the sector and asked banks to rein in lending to real estate developers. The “three red lines policy” required real estate developers to hold cash equal to short-term borrowing, limited liabilities to 0.7x assets, and required net debt to be equal to or below equity. As a result, Evergrande and other over-indebted property developers could not get the liquidity to pay suppliers and employees, and service bank and international bond payments. Evergrande missed an international bond payment in October 2021. Although developers tried to get customer financing in the form of pre-sale revenues, this was not sufficient. Suppliers stopped sending material and employees stopped working. Therefore, many homes remained unfinished. As a result, borrowers defaulted on their loans taken to finance the purchase. They asked Evergrande to reimburse their money. Unsold homes increased and home prices fell since developers offered huge discounts for new homes. Evergrande had taken many short-term loans to finance its long-term needs and this maturity mismatch also played a part in its collapse.

Just as the governments in the US bailed out the big banks during the crisis, the Chinese government finally relented and in January 2023 it had to create bailout funds to give special loans to developers to complete unfinished homes. Many local governments bought unfinished homes to create low-rental housing. The government had also to reduce the interest rate for home buyers. Finally, they reduced taxes on selling homes if one buys a new home. These government support measures reduce the cost of housing and finally, the share prices in property companies went up slightly.

In the meantime, the decision to buy or rent was also affected. Young people decided that the risk of paying for a home that is not completed was too high. Instead, they preferred to rent homes. Rentals are also increasing as the Chinese government is providing more low-rent housing. The concept map (Figure 1) catches the above explanation, combining a news item of the problem (Yu and Mitchell, 2022) with a more recent one with the government’s recent bail-out (Hale et al., 2023).

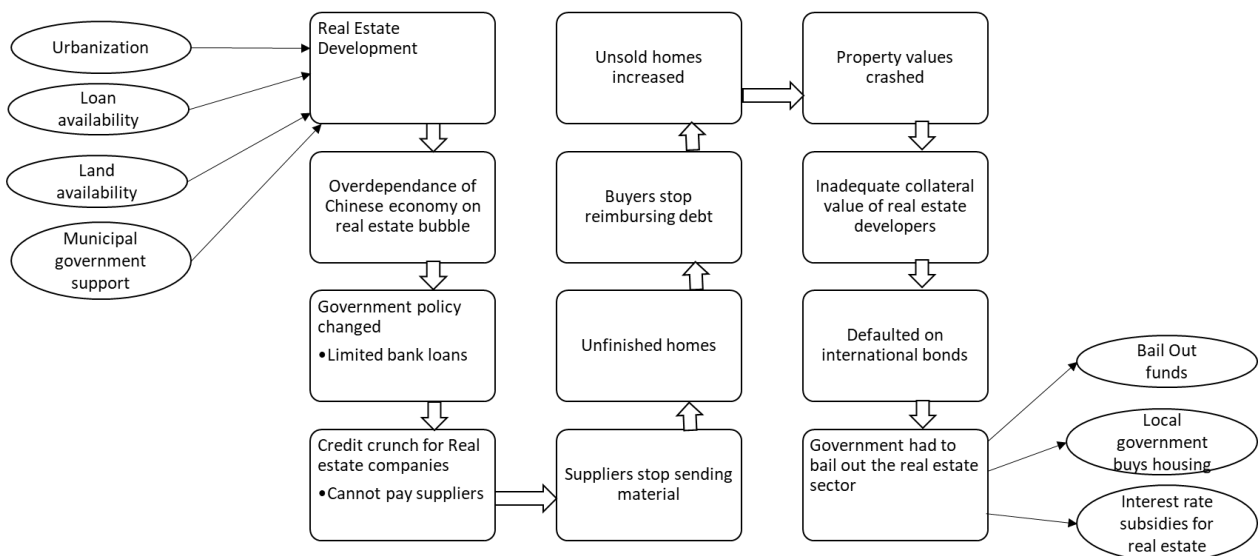




Figure 1: Concept map explaining the problems of the Chinese real estate market and proposed policy solutions.

### **Blackstone: The effect of interest rates on real estate investment funds**

Blackstone invests in and manages assets on behalf of pension funds and other leading institutions. This means that they manage assets for others and they don't take on the balance sheet risks directly. They serve institutional investors all across the world, including pension funds. They consider that they are providing financial security if they can make the funds grow for all the people who will retire. Blackstone also invests, for its own account, on a global basis in a range of asset classes including private equity, real estate, and public debt. In these cases, they own the investments and the need to make the businesses grow. The main investment areas are real estate, private equity, hedge funds, and credit insurance. The Blackstone Fund was founded in 1985 by Peter G Peterson and Stephen A. Schwarzman with \$400,000 in seed capital. It is now worth about \$95 billion, a growth of about 238,000 times in 38 years. Their income statement for 2021 indicates that they have grown 70% over the four years 2017 to 2021. Their revenue model includes a fee on the assets that they manage and a Commission on getting performance-based revenues. The 2021 activity report also indicates that half the capital invested in 2021 was in strategies that didn't exist five years ago. What this means is that large successful real estate firms are looking at the changed environment and adapting to the change rapidly. Therefore any course in real estate finance needs to focus on environmental changes that affect real estate performance.

Of course, the work of Blackstone receives its share of criticism. For example, they invested in companies linked to the commercialization and deforestation of the Amazon rainforest. Another report indicates that Blackstone had abused tenants with exorbitant fees, rent hikes, and aggressive eviction practices (Vandeveld, 2023). As a corporate strategy, landlords can offer to delay payment but if people still don't pay, they need to evict them. Evictions create a negative image especially because Blackstone is large and may need to evict many tenants. Therefore even if Blackstone has been far more patient than the average landlord, there is a higher chance of its image getting tarnished. This then creates a reputational risk for investors. Blackstone uses its financial clout to influence politics to ensure there is no rent control. All of these provide lessons in risk seeking and risk management, opening up discussion on business ethics.

One of the strengths of Blackstone is its high-productivity culture. However, if they merge with other businesses, ensuring high performance requires spreading this culture to the businesses they acquire. Each business that they buy has its own culture and changing culture is not easy. However, if they do not grow they will not attract people who want high performance. So, for the financial manager, it is important to have an

understanding of other aspects of management which may not have been important or perceived as important forty years ago.

In 2022 and 2023, interest rates have been increasing. For Blackstone, this is a threat because households and businesses may not take loans when property prices decrease. Therefore, the investors in real estate trusts will want the money back. Blackstone's strategy has been to limit redemptions in their real estate funds to 2% per month or 5% per quarter. Another strategy to combat this need to return money is to search for larger institutional investors, such as the University of California, and use these funds to pay off the small retail investors who want to withdraw. The problem with these strategies is that once customers don't get their money back, they will make noise and this will then create repercussions where other customers will also want their money back. Moreover, institutional investors would want a sweet deal which means that Blackstone will be paying more than what they were paying the retail investors. The concept map (figure 2) captures this discussion based on a newspaper article (Vandeveldt, 2023).

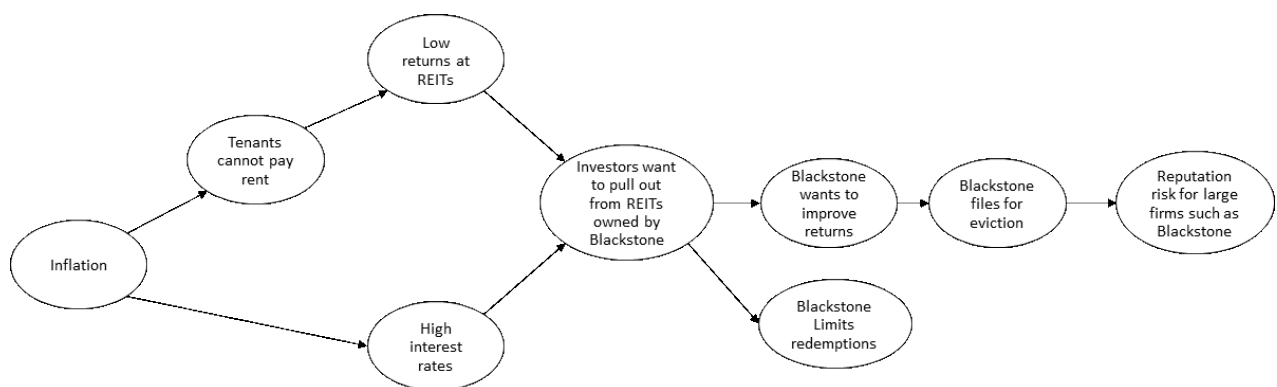


Figure 2: Concept map explaining why inflation and high interest rates lead to evictions.

### European Real Estate Price falling

In 2022 and 2023 interest rates have been increasing. For Real Estate owners, this is a threat because households and businesses may not take loans when property prices decrease. Higher interest rates may also indicate lower growth expectations for the economy as a whole, again depressing property prices.

Another phenomenon that has been affecting European real estate is inflation. Owing to inflation, many people are not able to pay rent. Property owners gain on paper as property value increases but they may not be able to sell their assets.

The real estate market is also affected by the increasing trend of working from home. This impacts housing as well as office properties. Housing prices increase for larger homes as people want nicer homes to work from. Office property prices decrease since less workspace is required. Office sharing is also becoming more common. The difficulties of banks in the USA, as well as Switzerland, have also taken their toll on investor wariness. The concept map (figure 3) indicates that all these phenomena are affecting the property market (Oliver, 2023).

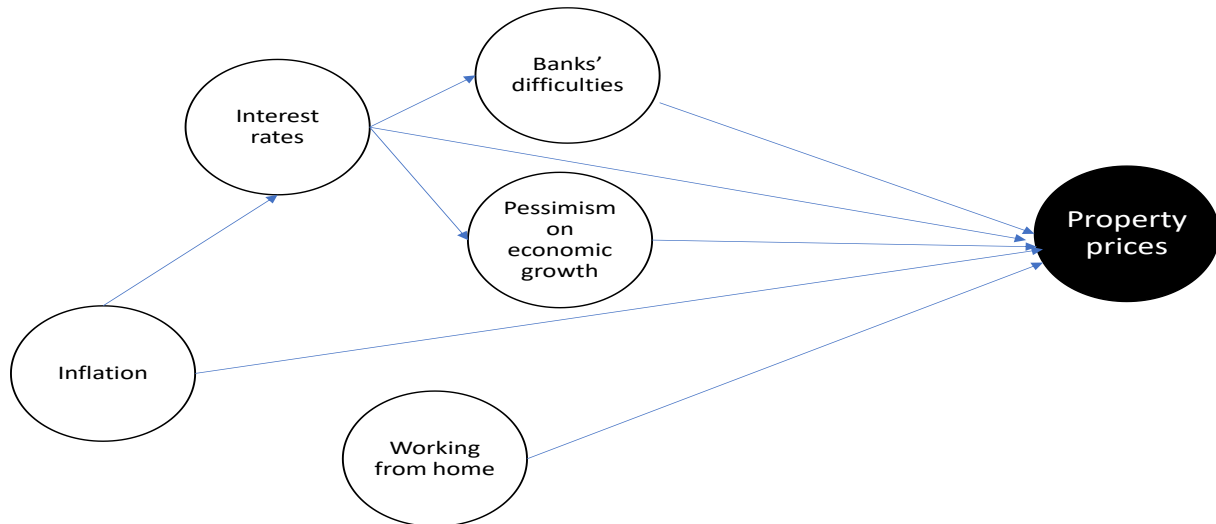


Figure 3: Concept map explaining falling property prices in Europe.

### **Türkiye: earthquake and need for certifications**

Türkiye has a high risk of earthquakes. According to the world bank, the cost of the property destroyed during this year's earthquake was about \$34 billion, including housing, offices, schools, hospitals, and infrastructure (Gunasekera et al., 2023). Rebuilding will cost about double that. This highlights the need for resilience in construction in such areas. Most of the buildings that collapsed seem to have had no respect for codes of construction in such zones or were built before the codes came into effect. The fact that no similar earthquake had occurred for over eighty years may have also made the constructors and certifiers lax.

The disaster helps us understand that the value of collateral for financing is strongly dependent on the quality of construction. Real estate financiers, therefore, have to be vigilant in checking if the building conforms to norms. However, if loans have already been released before the construction is complete, it may be a moral hazard that banks have to accept unless they have the building work audited in stages before releasing each tranche of the loan. The concept map (Figure 4) illustrates our discussion.

Türkiye cut its interest rates further in the wake of the disaster to finance the reconstruction. However, this may lead to an increase in inflation and an increase in the cost of the reconstruction.

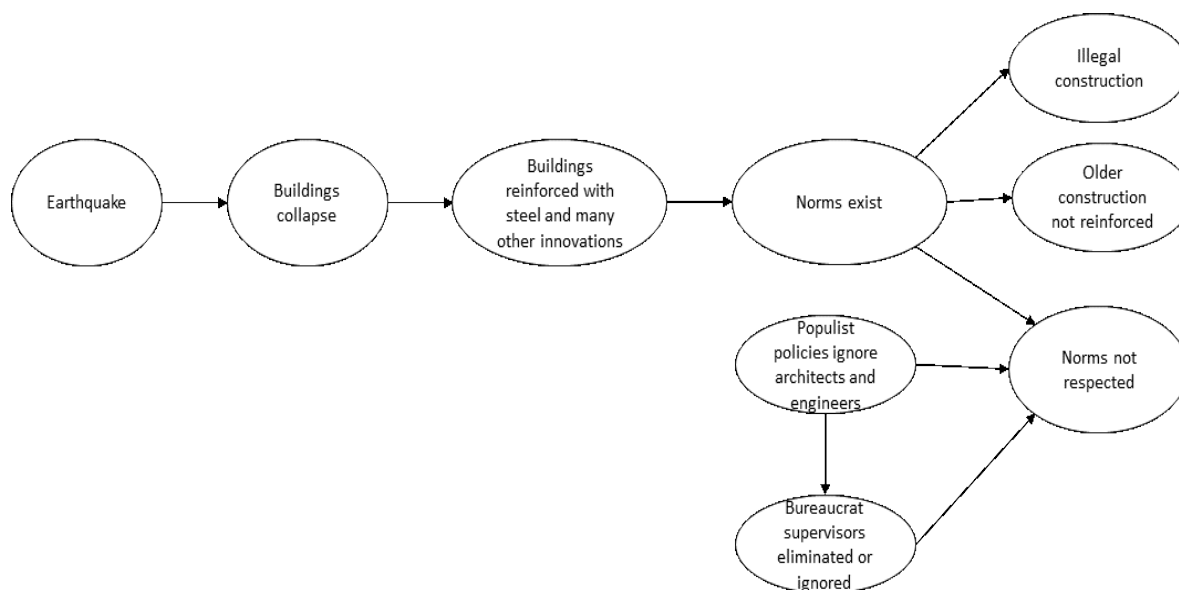


Figure 4. Concept Map explaining why earthquakes cause damages despite norms and certification

### Cryptocurrencies and international real estate transactions

It is always good to insert recent technological innovations in a course. Blockchain and cryptocurrency are one such innovation. A good question has been raised in a recent Financial Times article on whether you would buy your next house with crypto (Kao, 2022). The context that the article provides is one where a lot of people from all over the world have been buying housing, internationally.

The article contends that people have made a lot of money in bitcoins, people have also made a lot of money during the COVID boom when they had added crypto to their portfolios. At the same time, COVID created a flurry of real estate transactions as people moved to less polluted sites in the mountains and near the sea, driving up property prices there. The question is whether they can combine the virtual and the real worlds for financing international real estate transactions. These transactions incur currency exchange fees. If the transaction is in a common cryptocurrency, there would be no fees for currency conversion at the time of the transaction.



Essentially, while it is admitted that crypto is volatile, there is no foreign exchange converting fee. Therefore, using crypto could reduce costs for buyers and sellers operating internationally. This would require a formal legal framework in the country in which the property is situated, it would raise difficulties in assessing the tax implications and money laundering risks because money is not being converted and the transaction may be fairly invisible. It would also require financing by people who are willing to take the mortgage based on crypto valuations. The personnel of real estate companies need to be trained to think in terms of cryptocurrencies. The country would also need a crypto exchange that will allow operators to make payments in real or virtual currency so that either the seller or the buyer could choose which currency he's more comfortable with. Therefore, the need for education and training encompasses not only students of real estate finance but also people working in real estate companies and people working in the governments of these countries. The concept map (figure 5) indicates the different relationships. The five concepts on the right side could also be viewed as a topic list that needs to be addressed to successfully use cryptocurrency for international real estate transactions.

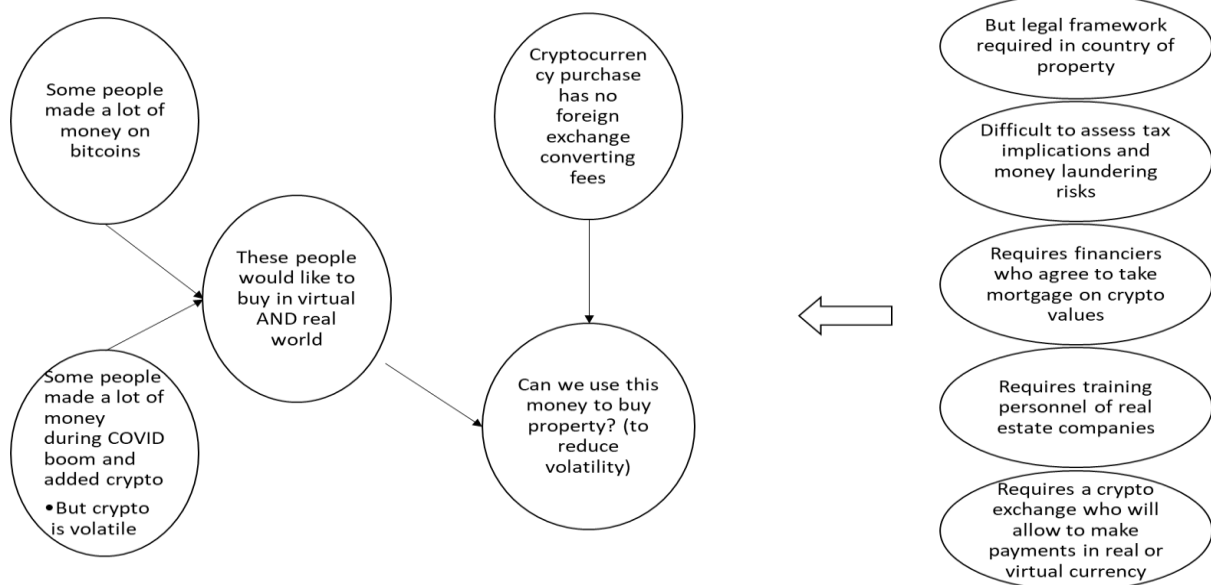


Figure 5: Concept map explaining the need and obstacles to cryptocurrency payments for international property deals.

**Concluding remarks**

What this article suggests is that in this VUCA world (Volatile, Uncertain, Complex, and Ambiguous), the speedy changes in technology, climate conditions, and economic events make it necessary to go beyond the textbook. Textbooks are good for explaining basic concepts, but the student needs to be aware of the current

financial environment which the lengthy publication process of a book does not allow. Therefore, referring to recent news items must become an integral part of any real estate finance course. Using concept maps and mind maps, textbook logic can be introduced into the discussion of the news. This kind of active learning is enjoyable and if done in groups serves to motivate students to learn better.

While I have provided a few examples, there are many other topics mentioned in the introduction that could be picked up in recent news articles and understood by mapping. However, mapping is not the only form of active learning. Students could also learn from many other active learning techniques such as simulation games that could be introduced in the classroom. However, conceiving and designing these games may still take time, and updating them for the latest news may be more complex. This may change with the advent of large language models such as Chat GPT.

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# Going back to Managerial Capitalism – Not a Retrograde Step

**Asish K Bhattacharyya**

## **ABSTRACT**

Monitoring boards are ineffective in monitoring the CEO. In the 21<sup>st</sup> century, monitoring efficiency is abysmal due to the widening information asymmetry between the CEO and the board constituted of independent directors. The monitoring board has lived its life, and it is time to go back to managerial capitalism and the advisory board system.

## **INTRODUCTION**

It is almost fifty years since the term corporate governance emerged in the U.S.A. The Federal Securities and Exchange Commission (SEC) first brought corporate governance onto the official reform agenda in the mid-1970s.<sup>1</sup> In the U.S.A., the monitoring board, with independent directors, replaced the advisory board after the collapse of some large corporations (like Penn Central Railroad) and the detection of many fraudulent transactions. The objective was to strengthen the internal constraints on managerial discretion. The concept of a monitoring board emerged in other countries after the Cadbury Committee<sup>2</sup> submitted its report in 1992.

Although the business ecosystem has changed fundamentally, the corporate governance system has not evolved.

In this essay, I discuss the changes in the business environment in the 21<sup>ST</sup> century and present a modest proposal for changes necessary in the corporate governance structure.

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<sup>1</sup> Brian R. Cheffins, The History of Corporate Governance in Wright, Mike. The Oxford Handbook of Corporate Governance (Oxford Handbooks) (p. 47). OUP Oxford. Kindle Edition.

<sup>2</sup> The Committee was set up in May 1991 by the Financial Reporting Council, the London Stock Exchange, and the accountancy profession in U.K..  
Indian Institute of Management Calcutta



## **BUSINESS ENVIRONMENT IN THE 21<sup>st</sup> CENTURY**

Cheffins (2015) identifies important factors that transformed the corporate structure in the U.S.A. Those are the decline (almost demise) of the corporate control market, which was considered a robust external mechanism for strengthening corporate governance; corporate scandals such as Enron and WorldCom that prompted a federal regulatory response (Sarbanes Oxley Act); change in the ownership structure (significant ownership by institutional investors); and change in institutional investors' approach, from selling out shares promptly when a company is underperforming to take corrective actions, as the increased prevalence of share ownership stakes sufficiently large to preclude exercising the "Wall Street Rule."<sup>3</sup>

In the 21<sup>st</sup> century, five fundamental changes occurred in the business environment - rapid technological innovations, globalisation, business purpose and governance, knowledge economy and competition.

### **Technological environment**

Birkinshaw (2018) observes that the digital revolution will profoundly impact a corporation's scale, scope and organisation. The digital age has blurred firms' boundaries. The firm's scope is changing as the cost of transacting in the market has fallen relative to transacting within the firm's boundary. Collaboration between individuals and firms has improved with the efficient use of information. This facilitates greater modularisation of work. Technological innovations have resulted in virtually unlimited economies of scale. Examples are network economies and platforms.

### **Globalisation**

The globalisation of supply chains and geographic expansion are becoming norms rather than an exception. Globalisation has reduced physical transportation, communications, data storage and analysis costs. New-age transnational organisations, global value chains, and "born global" entrepreneurial ventures pose challenges to traditional multinational firms. Although the recent geo-political tensions and the COVID-19 pandemic have disrupted the global value chains, they have not reversed the globalisation trend. The globalisation trend is likely to continue.

### **Business purpose and ESG**

For so long, managers single-mindedly pursued the objective of creating shareholder value. Initially, they resorted to short-term profitability. Later, at the dawn of the 21<sup>st</sup> century, they focused on preserving and creating long-term firm value. Focus on shareholder value distracted managers' attention from the company's purpose and led them to ignore sustainability issues. The triple bottom line (planet, people, and profit) received

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<sup>3</sup> Dumping of large volume of shares in the market results in sudden dip in the share price.  
Indian Institute of Management Calcutta

only lip service. Companies consumed natural resources recklessly, polluted the environment by dumping wastes and emitting carbons and contributed to climate change, and ignored the impact of their success on society. They never considered internalising the costs of negative externalities caused by their products and processes.

In the 21<sup>st</sup> century, managers cannot remain oblivious to the impact of their operations on the natural environment and society. Managers now realise that they must place purpose before profit.

The members of Generation Z<sup>4</sup>, now customers and employees of companies, are asking companies what their purpose is and what they are doing to address the issues like climate change and degradation of natural resources, which they have inherited because of the way businesses operated starting from the first industrial revolution. In the 21<sup>st</sup> century, companies will find attracting and retaining talent challenging unless they focus on their environmental and social responsibilities while preserving and creating the company's value. More and more customers are now ready to pay a premium for environment-friendly products and products produced through an environmentally friendly process. They shun companies that demonstrate socially irresponsible and unethical behaviour.

The commitment of countries to the UN's Global Sustainability Goals<sup>5</sup> has created an awareness among companies that their survival would be at stake unless they wisely use and regenerate the limited natural resources and support the government in containing and reducing social and economic inequalities. They are adopting the circular economy principle to minimise the use of natural resources. Governments are framing rules to accelerate the adoption of the circular economy principle. Widening inequality would make it difficult for companies to build a trusting relationship with society. Businesses will find it challenging to scale up their activities due to a lack of purchasing power with most of the population. Similarly, they will find it challenging to find the skills necessary to use new technologies unless the current and future generations are healthy and skillful.

Investors (asset management companies) are asking questions about how the company is dealing with environmental, social, and governance (ESG) issues. For example, In January 2018, Larry Fink, the CEO of BlackRock, the world's largest financial asset manager (with an AUM of \$ 8,594,485 million as of December 31, 2022), sent a letter to the CEOs of all the firms in his portfolio saying<sup>6</sup>: "Society is demanding that companies, both public and private, serve a social purpose. To prosper over time, every company must deliver financial performance and show how it contributes positively to society. Companies must benefit all of their stakeholders, including shareholders, employees, customers, and the communities in which they operate."

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<sup>4</sup> Generation Z refers to those born between 1994 and 2010.

<sup>5</sup> The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.

<sup>6</sup> Larry Fink, "A Sense of Purpose," BlackRock, [www.blackrock.com/hk/en/insights/larry-fink-ceo-letter](http://www.blackrock.com/hk/en/insights/larry-fink-ceo-letter).

Henderson observes, “For Fink to suggest that “companies must serve a social purpose” is the rough equivalent of Martin Luther nailing his ninety-five theses to Wittenberg Castle’s church door<sup>7</sup>.

### **Knowledge economy**

The companies post the first Industrial Revolution till the 20<sup>th</sup> century were a bunch of tangible assets. They created value using tangible assets (like property, plant and machinery) supported by complementary assets (like product brands and patents). Twenty-first-century corporations are a hive of ideas. In an HBR article, Davenport<sup>8</sup> wrote that 21st-century corporations are driven by data and fueled by knowledge work. Those corporations create value by using knowledge assets<sup>9</sup>. Firms can extend their scope by utilisation of data and information technology. Examples of platform businesses are Facebook, Uber, WhatsApp, Amazon, JioMart, and Twitter. Those businesses revolutionised the economy and generated significant employment.

### **Competition**

Aveni et al. (2010) observe that competitive advantage is not sustainable or enduring but more temporary. This situation has arisen due to fast-paced competitive actions and counter-responses among rivals, disruptions caused by new firms with innovative business models challenging the incumbent players, incumbent players expanding their scope rapidly, and discontinuities in the business environment. For example, Tata Motors sells electric buses through Gross Cost Contract (GCC). The public authority (like the Delhi government) pays the Original Equipment Manufacturers (OEMs) on a per-kilometre basis and supervises their functioning. The OEMs bear all the operation and maintenance costs. This eliminates the need for third-party services for maintaining the buses.

Ideation, innovation and resilience are the mantras for the survival and growth of corporations in the 21<sup>st</sup> century.

## **CHALLENGES BEFORE THE TWENTY-FIRST CENTURY CORPORATION**

In the twenty-first century, companies are facing new challenges that were never faced by companies earlier. Companies need to address those challenges collectively.

### **Acquisition and retention of talent**

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<sup>7</sup> The legend is that on October 31, 1517, Martin Luther, the priest and scholar, approaches the door of the Castle Church in Wittenberg, Germany, and nails a piece of paper to it containing the 95 revolutionary opinions that would begin the Protestant Reformation. However, historians now believe that Martin Luther did not act that dramatically.

<sup>8</sup> Davenport, Thomas H. Google-the 21<sup>st</sup> century company. Available at: <https://hbr.org/2008/04/google-the-21st-century-company>. Extracted on May 18, 2023

<sup>9</sup> Knowledge assets are talent, skills, know-how, know-why, relationships, and machines and networks that embody them)

The new generation of employees' priority is not job security. They look to contribute to a well-defined purpose in an intellectual climate that provides learning opportunities and opportunities to work independently. They look for a brand and reputation that help them to enhance their self-esteem and arrange resources from the external environment. They are loyal not to the company but to the team, communities of practice, and groups of one's occupation. Only those companies that meet the above needs can attract and retain talent.

Davenport (2023) observes that a true 21st-century corporation (like Google) gets new ideas and products from smart and connected employees (millennials and Generation Z). They strongly encourage employees to spend a specified chunk of time on innovation and ensure that there are few barriers to getting innovation into the marketplace. They provide excellent technology and physical environments and create a stimulating intellectual environment at work.

### **Ethics, equity, and inclusiveness**

Companies share the value created by them based on the relative bargaining powers of different stakeholder groups. For example, many Indian companies shy away from paying minimum wages decided by the government to unskilled workers, primarily migrant workers. In some industrial sectors, companies violate the principle of 'equal pay for equal work' while deciding compensation to contract workers who are not on the company's payroll. In the 21<sup>st</sup> century, stakeholders expect companies to distribute value based on ethics, equity, and inclusiveness. Therefore, 21st-century corporations need to redefine the pathway of value created through the cooperation and coordination between owners of different factors of production. They cannot ignore the issue, as stakeholders expect companies to behave ethically and adopt the principles of equity and inclusiveness.

Data privacy presents an ethical challenge. Companies have access to big data and use data analytics to get relevant information for strategic and tactical decisions. Similarly, they use AI to their benefit. Regulations regarding data privacy lag the pace with which data analytics and AI progress. Therefore, managers often face the ethical dilemma of whether they should use the data in a way that benefits the company but might violate the data privacy norms while complying with the related regulations. It is a serious challenge to managers of the 21<sup>st</sup> -century corporations.

Till now, companies managed stakeholders based on their power and interest in the company. They ignored the interest of those stakeholders who cannot impact the company's successes but get impacted by that. 21st-century corporations face challenges in identifying stakeholders impacted by the corporation's success (but cannot impact the success) and dealing with them fairly.

Companies must collaborate with archetypes who use similar resources as inputs, including competitors, to fulfil environmental and social responsibilities. This is a challenge for the managers of 21st-century corporations.

## **REIMAGING CORPORATE GOVERNANCE**

It is well established that the CEO is much better informed than the board, as most of the directors in monitoring boards are part-time independent directors. Therefore, the board cannot perform its oversight function effectively. Over the past fifty years, many corporate governance failures (like Enron, WorldCom, Satyam and the global financial crisis of 2008) vindicate the same. Independent directors jump the boat when they detect a signal that the board might capsize shortly. Bar-Hava et al. (2021), observe that the likelihood of resignation increases with a director's reputation and weak future firm performance. They report that results suggest that independent directors' personal reputation concerns might conflict with the shareholders' interests, although the public perception is that they protect non-controlling shareholders' interests. This research result corroborates earlier research findings. Regulators are conscious of the weaknesses of the institution of independent directors. Therefore, worldwide, regulators continuously bring incremental changes to strengthen the institution. However, they so far failed to address the motivation and independence issues.

In reality, the monitoring board is a façade that gives the illusion that the board monitors the CEO. Most boards function as advisory boards in the garb of a monitoring board. Regulators and courts seldom penalise independent directors for corporate governance failures.

In the 21<sup>st</sup> century, information asymmetry between the CEO and the Board has widened due to the pace of changes in the ecosystem and fleeting competitive advantage resulting in frequent changes in strategies and the business model. Therefore, it is time to consider whether the monitoring board has lived its life.

In a complex business environment, when stakeholders expect the managers to own up the responsibility for the environmental and social impact of their company's success, the CEO needs a capable board to use as a sounding board to validate its assumptions and decisions and seek advice on critical issues. CEO should be allowed to choose her board members whom she can trust. Even now, research shows that individuals nominated by the board for appointment on the board are selected from the network of directors and senior management, as no CEO (controlling shareholder or a professional CEO) would like to have unknown devils (or angels) on the board. Independent directors on the board fulfil the stipulated criteria established by law but are often sympathetic to the incumbent management for right or wrong reasons.

Regulators' initiatives have improved the financial audit quality and enhanced transparency (like sustainability reporting and disclosures under the International Financial Reporting Standards), and the speed

with which information is disseminated by stakeholders using social media has given impetus to shareholders and social activism. Investors, employees (millennials and Generation Z), customers and social activists are asking tough questions. The passive monitoring by credit rating agencies and players in the capital market has improved.

It is time that regulators should consider going back to managerial capitalism with an advisory board model. Incremental improvements in the monitoring board system would not work.

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# Blended Finance: Unlocking Commercial Finance for Sustainable Development

**Utkarsh Majmudar**

The transition to a green economy will require massive funding. It is estimated that the investment needs of emerging markets and developing economies could reach \$1 trillion a year by 2030 (International Monetary Fund, 2022). Much of this should have come from the governments and international agencies like CDC Group or International Finance Corporation (IFC). Unfortunately, most economies around the world are running large deficits. On the other hand, the development institutions have a wide array of financing requests. While institutional investors have been involved in green finance, they have typically focused on low-risk bankable projects. To achieve Sustainable Development Goals (SDGs) and meet the needs of climate finance there is a need to bring together public and private sources of financing. One approach to solving this problem is blended finance.

In fact, in the FY22 budget the Indian government announced the use of blended finance approach for the sunrise sector. The sunrise sector includes healthcare, livelihoods, education, climate action, deep tech, digital economy, pharma and agritech. Thus, the potential for blended finance in India is large.

So, what is blended finance?

There is no single definition of blended finance. Different funders adopt different definitions.

The World Economic Forum and OECD define Blended Finance as "...the strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets." (OECD & World Economic Forum, 2015)

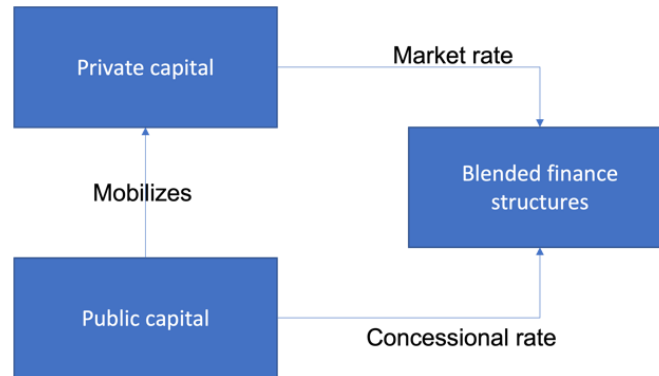
According to International Development Finance Club, "...blended finance aims at enhancing the quality of partnership between the public and private sector by maximizing synergies while setting clear impact targets towards sustainable development." (International Development Finance Club, 2019)

Development Initiatives defines blended finance as, "...blended finance refers to a combination of resources, either from official public sources (governments and/or DFIs) or philanthropic actors with capital from other sources (either official public or private actors)." (Development Initiatives, 2016)

If one were to observe carefully from the definitions listed above, a key feature of blended finance are:

1. **Additionality:** Some of the financial requirements have to be met from private sources.
2. **Positive development impact:** The blending of finance will result in social, economic or environmental benefit.

**Figure 1: Blended finance**



Source: author

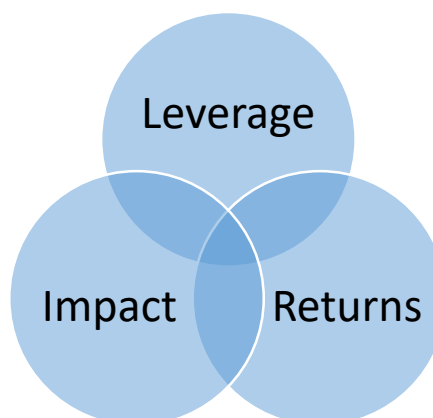
While private sources are more easily understood, the public funding needs a little explanation. Public sources include government agencies and development financial institutions (DFIs). These DFIs may be bilateral (single country) or multilateral (multiple countries).

### The Three Pillars of blended finance

Blended finance has three key characteristics:

1. **Leverage:** Public and development finance acts as a lever to attract private finance.
2. **Impact:** Provides economic, environmental, and social progress through investments.
3. **Returns:** It allows private investors to earn returns commensurate with market expectations.

**Figure 2: The Three Pillars of Blended Finance**



Source: OECD and World Economic Forum. 2015. 'Blended Finance Vol. 1: A Primer for Development Finance and Philanthropic Funders'. World Economic Forum.

Blended finance can work across many geographies, an array of financial instruments and a wide variety of structures. It brings together many types of stakeholders that partner in a fund transaction. It brings together a unique mix of private and public capital.

### **How does blended finance work**

Money is raised from investors – private (institutional investors) and public (concessionary investors by the intermediaries (development banks, foundations and NGOs) who invest in climate, social and development projects (*What Is Blended Finance, and Why It Matters*)

### **Investors**

- There are two types of investors that provide long-term, large scale capital that is necessary to fund critical development needs:
  - **Institutional investors** are banks, insurers, and asset managers among others who invest a significant component of the required capital. They usually invest for profitable risk-adjusted returns.
  - **Concessionary investors** consist of public development assistance and foundations. They invest a lesser portion of the capital and are willing to accept a higher risk of loss. They invest in below-market rates of return.

### **Intermediaries**

- These consist of teams of subject matter experts (SMEs). These SMEs are often sponsored by development banks, private institutions and NGOs. Intermediaries bring investors with financial resources and investment projects together.

### **Projects**

- These projects include clean water access, medical facilities and sustainable development programs. They receive finance and put the money to use to meet specified criteria.

Then there is the issue of what financial instruments are used in blended finance.

- a. **Equity:** Ownership in the project/company.
- b. **Debt:** money lent to be repaid later along with interest. There are two types of debt instruments—market rate debt and concessional debt.
- c. **Guarantees:** They protect the investors from the risk of capital losses.
- d. **Grants:** Here a financial commitment or investment is made without any expectation of repayment or compensation over a fixed period of time.

## OECD Principles

The OECD has set out the following principles for a common framework for blended finance (*Blended Finances Principles - OECD*).

*Principle 1:* Anchor Blended Finance use to a Development Rationale

*Principle 2:* Design Blended Finance to Increase the Mobilisation of Commercial Finance

*Principle 3:* Tailor Blended Finance to Local Context

*Principle 4:* Focus On Effective Partnering for Blended Finance

*Principle 5:* Monitor Blended Finance for Transparency and Results

These principles are aimed at helping increase the adoption of blended finance. They also act as guide maps for blended finance professionals.

## Growth of blended finance

Blended finance has grown rapidly both in the number of deals and the total capital committed. It is estimated that roughly USD 180bn worth capital has been raised through blended finance to date. This money to be used for sustainable development in developing countries.

**Figure 3: Growth of Blended Finance**

Year	Number of Transactions Closed	Total Capital Committed (USD bn)
2011	181	41
2012	225	51
2013	270	59
2014	323	80

2015	378	99
2016	432	115
2017	498	128
2018	558	144
2019	612	155
2020	677	161
2021	739	168
2022	759	170

Source: Blended Finance, <https://www.convergence.finance/blended-finance>

### Three questions

Before going for blended finance, one needs to ask three questions:

1. Development rationale: Will the project create a developmental impact?
2. Additionality rationale: Does the financial institution providing public finance add value beyond what the market offers?
3. Concessional rationale: Do residual participation or behavioural constraints exist?

Blended finance succeeds only when all three rationale (development, additionality and concessional) hold simultaneously. A positive development impact is necessary but not sufficient to justify the use of blended finance. Even without subsidies, social welfare can be increased by providing goods and services that generate large positive externalities.

Similarly, the use of additionality is necessary but not sufficient. The question to ask is: Can the market finance the project without the use of public resources?

By looking at each rationale separately, it is possible to identify the benefits (or distortions) to society that justifies the use of concessional finance at appropriate levels.

### Approaches to Blended finance

There are three main approaches to blended finance: technical assistance, risk underwriting and market incentives (OECD & World Economic Forum, 2015, International Development Finance Club, 2019).

**Technical assistance:** Technical assistance is a key tool that address the knowledge gaps and allows the project to be developed. Here the development funds can be used to provide many things. These include

- Advisory and consulting services for project preparation. These are particularly critical in the early stages of the project, for instance, exploration services.
- Operational assistance in form of management and marketing,
- Product development,
- Training to improve skills,
- Knowledge transfer and other professional services,

To improve the viability of the investee's project and in turn improve investment performance. This greatly improves the ability of the project to attract private capital by reducing the costs and risks associated with new markets or technical uncertainty. It also reduces transaction costs and reduces operational risk.

### **Risk underwriting:**

Risk underwriting instruments can benefit in either of the two ways. They can improve the credit rating or profile of the project or the company. Alternatively, they can provide comfort to investors that they will be able to recover their investments or absorb losses. This mechanism provides a shield against losses from negative events or provides direct compensation or assumes losses. Insurance policies and guarantees are two most common risk underwriting tools.

**Insurance policies:** In these contracts when an adverse event occurs a third party will make the specified payment.

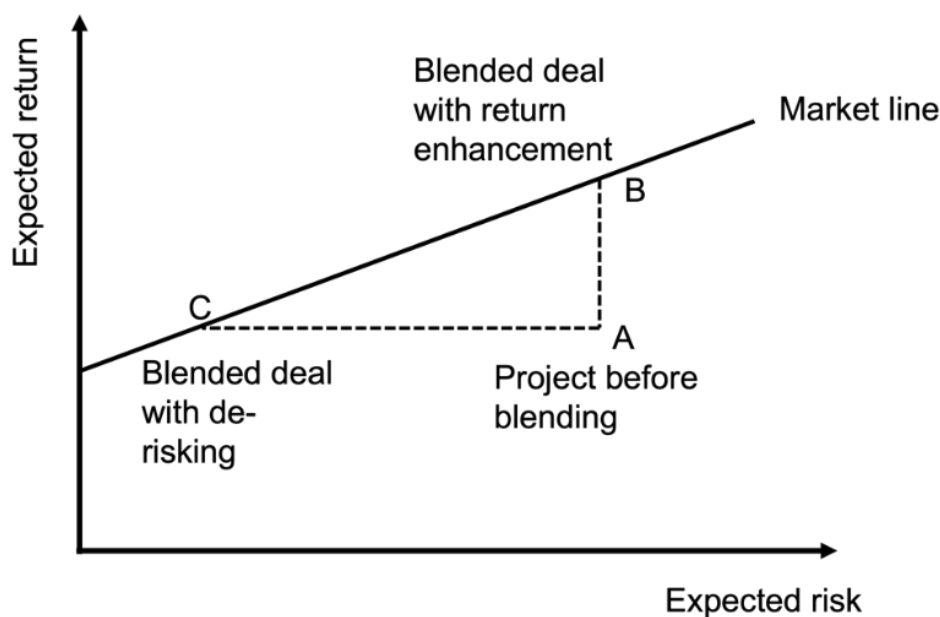
**Guarantees:** Guarantees are a promise that in the event an undesirable event occurs, the guarantor will assume responsibility and take action on behalf of the guaranteed party.

**Market incentives:** There are several sectors where high impact projects can be undertaken. However, they often lack normal market fundamentals. Here market incentives are required. Market incentives become important in markets that require innovation. Without incentives the potential for these markets cannot be realised. Market incentives can take several forms. These include advance market commitments, awards, prizes, challenge funds, matching funds, and development impact bonds, among others.

### **Blended finance and cost of capital**

Blended finance is used as a means of creating acceptable risk-return profiles for institutional investors so that they can allocate capital to these projects. This is achieved through de-risking the project or through return enhancement, or a combination of both. Typical de-risking instruments may include (partial) risk guarantees, first-loss positions, grants, technical assistance, subordinated debt or junior equity. These are often used in areas where capital is not flowing at scale or unlocking new sources of capital. Return enhancement can be created by giving investors priority rights to cash flows generated.



**Figure 3: Blended Finance: The Risk-Return Tradeoff**

Source: authors

As can be seen in figure 3, the use of blended finance can either raise the return profile of the project (from A to B) by using revenue enhancement mechanisms or reduce the risk of the project (A to C) by using de-risking strategies. A combination of revenue enhancement and de-risking would lead to a point on the market line between B and C.

### **The future of blended finance**

Given the constraints of high debts and constrained finances because of the pandemic and rising interest rates it is increasingly becoming difficult for public finance to meet pressing social and climate financing needs. Financial markets alone cannot do the job. However, public and private finance together can do the job. Let us look at the scale of the problem. It is estimated that to achieve net zero greenhouse gas emissions by 2050 would require \$275 trillion in physical assets (Financing the Net-Zero Transition: From Planning to Practice, McKinsey, n.d.). Given the scale of investments, it is impossible for either the private or the public sector to fund them. The investors will need a mix of public and private funds to meet the global challenges. New instruments, financing structures and risk mitigation tools will have to be designed to meet the funding gap. Strong and appropriate governance structures can help minimize several risks and reduce moral hazards associated with these projects, especially where insurance and guarantees are in place. In developing and less-developed economies and development banks will need to play a key role and take the help of private sector to meet the large financing needs.

YES BANK uses blended finance to help the agariyas to address the manifold challenges. The bank blends its financial innovation with socio-environmental sustainability, together with a local co-operative bank. It also takes the support of an NGO as a local implementing agency on the ground.

### **Features of the blended finance facility**

- YES BANK provides grants towards credit enhancement and credit affordability. Credit enhancement is offered by means of a first loss default guarantee to the cooperative bank. Credit affordability is improved through interest subvention.
- The twin benefits of credit enhancement and credit affordability enables the cooperative bank to offer an affordable 5-year tenor loans to farmers who use the money to purchase solar pumps.
- To enable repayment, the repayment is scheduled only during the earning season.
- YES BANK also helps the local NGOs by providing implementation support.

### **Key attributes of the facility**

- YES BANK helps align the interest of all the stakeholders in the value chain. These stakeholders include the rural cooperative bank, woman salt farmers, NGOs and donor bank (the private bank).
- It helps distribute the risk among stakeholders and thus reduce the risk for the primary lender.
- By reducing risk YES BANK enables the delivery of energy inclusion products and services to the women at the bottom of the pyramid.
- It creates a positive impact in the form livelihood improvements, woman empowerment, energy inclusion and financial inclusion.

The performance of YES BANK acts as a guide for social transformation through blended finance for development banks, multilateral organizations and donor/philanthropists

Source: (Yes Bank, n.d.)

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# Well-connected directors: When do they really matter?

**Deepali Kalia**

A director in India serves on the boards of an average of five firms in a financial year. This number is higher if the director is female. Serving on boards of multiple organizations helps directors network with experts from different industries. It also leads to the formation of various indirect connections which can be utilized eventually. This article discusses the evolution of the role of directors, the rationale behind directors occupying multiple board positions, the benefits of better-connected directors, on both the individual and firm level, and the various factors which may limit the incremental benefits of well-connected directors.

## **The evolution of the role of directors**

The separation of ownership and control in firms is intimately associated with problems of agency. Examples of agency problems include managers absconding with firms' funds, squandering them on non-profitable projects or drawing unjustified executive remuneration. Agency issues lead to the improper utilization of the firm's resources and reduce the overall efficiency and profitability of the firm. Corporate governance mechanisms such as establishing the board are considered effective solutions to the agency problem. Members of the board are appointed by shareholders through a voting process and perform multiple tasks such as reducing and eliminating agency problems through managerial oversight, corporate decision making, and resource provision for firms. The role of investor protection is particularly true for an independent director, who is an "outsider" to the firm and is considered responsible for improving corporate credibility and governance standards.

However, with time, the definition of stakeholders has evolved, businesses have transcended geographical boundaries, and the overall industry requirements have changed. With this, traditional forms of governance are also being challenged. Boards are now under pressure to develop a broader mind-set and newer skills to deal with the changing strategy requirements. The shift in expectations from the board is further intensified by the market context in which these firms function. We elaborate on this further.

Market context is a crucial aspect of the business environment which needs consideration when making firm-level decisions. Countries like the USA or UK, labelled developed economies, have relatively lower levels of information asymmetry. They also have in place strong lending systems that help supplement access to information with easy access to credit and capital. On the other hand, emerging markets like India, Italy and China are marked with information voids i.e., barriers when trying to access information, as well as capital

voids, implying firms facing a paucity of capital when funding new projects. This causes firms in developing nations to intensify information search and optimize their allocation of capital, occasionally also forcing them to forego healthy projects.

Overcoming these gaps is crucial for business development. Firms that operate in markets with voids adopt various channels of doing so. The directors also continually adapt to the requirements of the firms and accept a more resource provision based role. This extended role involves providing information, access to technical know-how, and identifying potential sources of capital, thereby ensuring access to credit and information, in addition to their usual task of monitoring. In most emerging markets, directors, by performing the additional function of a resource provider, ensure access to resources that are crucial in shaping the strategic bent of the firms.

At this point it becomes critical to understand the potential sources through which directors gather resources. One possible way is to channel their connections and utilize their position in formal and informal networks. Informal connections include alumni contacts and affiliations with industry associations, and examples of formal networks include connections established while providing contemporaneous service to different boards. Being better connected (being embedded deeper into these networks) adds to the ability of directors to arrange for resources and information when needed. These benefits are well-documented in the networks literature (Omer *et al.*, 2014; Benson *et al.*, 2018).

For example, owing to their position in networks, well-connected directors receive information faster; the relative cost of procuring this information is also low (Onal, 2023). Second, rich discussions within networks provide connected directors better industry-wide knowledge and improve their understanding of market trends, improving their ability to forecast industry-relevant changes and the overall market demand (Srinivasan *et al.*, 2018; Ke *et al.*, 2019). A connected director thus provides information-based advantages to the firms he serves while simultaneously improving his skill set and the ability to contribute to the strategic development of firms. Investors also perceive this trait as valuable. Firms with better-connected directors display better market performance in general as well as during heightened uncertainty (Larcker *et al.*, 2013; Carney *et al.*, 2020).

Being embedded deeper into the networks also has various resource-based benefits. For example, firms with better-connected directors enjoy an easier access to capital. This happens through multiple ways. First, directors utilize their contacts with lenders, analysts and banks (which they gain when serving as directors of various firms), their connections help them raise capital at lower rates (Houston *et al.*, 2014; Zhang and Truong, 2019). Second, better-connected directors carry a positive market perception. This helps firms establish legitimacy, especially when raising funds through IPOs (Chen *et al.*, 2016). Additional resource-based benefits include acting as a connector between firms and improving their quality of mergers and research

and development (Faleye *et al.*, 2014; Kang *et al.*, 2018). Another often overlooked but crucial advantage of a well-connected director is his indirect connections. Indirect connections augment a director's ability to arrange expertise in case he lacks the necessary expertise himself (Andersen *et al.*, 2022).

The potential of well-connected directors to contribute towards a firm's development explains the demand for such directors in director labour markets. Firms actively seek better-connected directors for their boards in hopes of bridging various institutional voids (Brown *et al.*, 2019). To maintain and improve their position in networks, directors also avoid associations with firms that may harm their reputation and lead to an eventual loss of board seats. They also supplement their attempts to maintain the reputation of the firms they serve by demanding strong external governance mechanisms such as high audit quality (Kalia *et al.*, 2023).

While the role of networks in knowledge and information transfer cannot be disregarded, connected directors are not the only mechanism an economy has to overcome various voids. Another common mistake in literature is generalizing the results of one market for another. For example, Indian businesses function in a unique market. In terms of ownership structure, a significant number of firms here are business group affiliates or family firms. India also has a different overall governance context and multiple market participants who perform the role of informal channels. For example, there exist alternate channels such as promoter networks and lender networks, information asymmetry is reduced through analyst coverage and forecasts as well, in addition to the information transmission between business groups. Under such circumstances, do director networks carry the same incremental value in India as in other developed and emerging markets? We discuss the potential factors that may affect the value of director networks in India.

### **1. The domination of business groups**

The Indian market consists of multiple business groups. More than half of the Nifty 500; an index that represents more than 96% of the Indian market, comprises of firms that are business group affiliates. This affiliation has a multi-fold impact. First, information transfer between business group affiliates is faster, and second, business groups are known to channel funds when one of their affiliates faces a capital crunch. For example, internal capital markets are an alternate source of capital that is frequently tapped by business groups to gain short-term and long-term capital. Alternate sources such as business group affiliations thus restrict the dependence on connected directors and the firm's structure ensures that gaps in the business environment get bridged without bearing any additional monetary costs (Mukherjee *et al.*, 2018), thereby making highly networked directors less lucrative.

### **2. Presence of alternate informal channels**



Second, high-growth economies like India frequently face a credit crunch and rely on venture capitalists, promoters, underwriters and bankers to meet their credit requirements<sup>10</sup>. Often various firms (both standalone and business group affiliates) tend to share the same set of promoters and bankers. These capital providers have access to both financial and non-financial information of firms and frequently act as brokers of information should any of these companies face informational voids. Their motivation to share this information often includes vested interests in the firms themselves. For example, banks seek to recover the investments made in a firm's capital-intensive projects, and promoters seek to maintain and enhance the market value of their shares.

### 3. Emphasis on number of connections over quality of connections

While the impact of the size of a director's network is well explored, attention must also be paid to the quality of the directors and his network. Owing to a limited director pool, director appointment in India is an uphill task. Very often, the same few directors find a place on multiple boards. This is a more substantial concern for women directors as their number is even lesser<sup>11</sup>.

Although the strength of connections is understandably higher in such cases (serving together at multiple places is likely to lead to less friction and quick decision-making), the overall quality of strategic insights declines. Multiple appointments of the same directors across boards leads to a lack of diversity in the overall board composition, making it difficult to generate new ideas that would benefit firms. It is also unlikely that firms will possess information that can be used for strategic advantage as similar information will flow between similar director groups.

In compliance with the Companies Act of 2013, one third of the board of Indian firms must be independent and at least one woman director must sit on the board of Indian firms. To work around these mandates, many firms used regulatory loopholes and bring female family members such as wives, daughters and relatives of the current management on their boards. Under such circumstances, their connectedness might not bring any additional benefits and lose relevance.

Business groups also often appoint the same directors across their multiple affiliates. This is done to adhere to the broader vision of the conglomerate and to help enhance the speed of implementing policies across firms. On occasion, this is known to reduce the role of directors as they face pressure to conform to the requirements

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<sup>10</sup> [https://www.ey.com/en\\_in/india-at-100/how-india-can-fill-the-credit-gap-to-fuel-economic-growth](https://www.ey.com/en_in/india-at-100/how-india-can-fill-the-credit-gap-to-fuel-economic-growth) (accessed on 20.03.2023)

<sup>11</sup> <https://www.livemint.com/Companies/9tIeuFcZJUAPPfjxcTHpvJ/Indian-companies-struggle-to-place-women-on-boards.html> (accessed on 20.03.2023)

and policies of firms<sup>12</sup>. Sitting on multiple firms of the same group may also hinder a director's ability to monitor accurately. In the past, such connected directors have misused their connections to display unethical behaviour, with practices such as tunnelling and informed trades coming to light<sup>13</sup>.

#### 4. Uncertainty levels in the business environment

An upcoming study (Kalia et al., 2023), which explores the perception of director networks in India also finds that investors do not attach any incremental value to firms with better-connected directors in general. This relationship is moderated by the level of uncertainty in the environment; for example, during the COVID-19 pandemic, information breakdowns were rampant, and information asymmetry escalated. Under such circumstances, investors perceived director networks as an uncertainty mitigation mechanism and investors valued firms with better-connected directors positively. This positive perception is correlated to the level of uncertainty in the business environment. For example, even within the time frame of the pandemic, higher levels of uncertainty were documented during the lockdown as there was ambiguity regarding markets reopening, availability of vaccines, availability of essential products and job opportunities in general. The investor perception of firms with better-connected directors was much stronger and higher during this period.

A more efficient way to overcome the problem of voids includes a better understanding of the country's markets and institutions and focusing on the quality of connection over the mere existence of the connections. The market context should be considered when strategizing ways to overcome these voids.

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# Renewable Energy Financing in India

Samhitha Kasibhatta

## Abstract

India's installed renewable energy capacity, as of 2022, is 111 GW. It aims to achieve a 500 GW installation by 2030, and has even pledged at the COP 26 summit, carbon neutrality by 2070. In this article, we go through a brief overview on renewable energy financing and the scenario in India. We touch up on the advantages and disadvantages of currently available modes of financing in the literature and discuss the way forward.

## Introduction

Transition to renewable energy is one of the primary goals of all the countries in the world to reach the targets pertaining to climate change stipulated in COP 27. Access to clean energy is required not only for environmental purposes but also for sustainable development. Better availability of clean energy gives rise to positive externalities such as job creation, competitiveness in terms of development, etc. It improves sanitation and agricultural productivity as well. In some countries, lack of equitable and affordable access to energy is a barrier which is preventing them from development.

In COP 26 summit, India, the fourth largest country by CO<sub>2</sub> emissions, has pledged to reach carbon neutrality by 2070. China and USA, countries in the first two positions with respect to CO<sub>2</sub> emissions, are attempting to be net zero in terms of emissions by 2060 and 2050 respectively. For this purpose, it has been estimated that India needs climate finance of \$1 trillion.

However, Climate Action Tracker rated the long term strategy for low carbon development which India put forward in COP 27 summit as "poor", for there have not been clear outlines on how it will be financed beyond current schemes and policies. The emissions sectors are not fully covered under the targets, and it excludes both international aviation and shipping. Moreover, there is reliance on international reserves to reach net zero emissions.

In this article, we will review important aspects of renewable energy financing and what contemporary literature and practitioners opine about how to finance the transition<sup>14</sup>.

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<sup>14</sup> Transition involves invention, innovation and diffusion [Polzin and Sanders(2020)]  
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## **Problems in Renewable Energy Financing**

Demand for electricity depends on highly uncertain factors. It is really difficult to forecast power demand in any region ahead of time. The practice has been to bifurcate demand into base load and peak load, while supplying base load with reliable power generation systems like thermal and hydro, and catering to the peak load with the help of renewable energy systems. Another major difficulty arises here, as two primary sources of renewable energy, i.e., solar and wind in turn depend on highly uncertain sources. In case of solar power generation, it is impossible to generate power during night time. Cost efficient storage technology is still under development.

Moreover, as per an Asian Development Bank report on India in 2018, owing to the federal structure of Indian government, it is necessary to coordinate between different players to accumulate financing, which is time and resource intensive. As can be observed, there is an urgent need for research to take place in order to facilitate innovation. However, uncertainty in the end result disincentivizes VC/PE investors from taking up renewable energy investments.

## **Modes of Financing**

Project financing usually involves non-recourse financing of one or more projects. In general corporate finance applications, there is a claim against the assets of the corporation; whereas in project financing, there is no scope to make similar claims, thus rendering it more risky. Other differences between corporate and project finance include the duration - corporate finance is essentially a going concern whereas a project has a particular predetermined duration; there are no reinvestments involved in project finance and it is a relatively complex transaction. Project finance operates through Special Purpose Entities. It even aids in reducing agency issues due to clearer outlining of dividend payouts. It also alleviates the problem of underinvestment by providing a special financing channel for projects for which funds are unavailable. It is worth noting that debt in project financing is usually raised from banks instead of bond issues owing to banks' superior experience. Banks generally have the expertise to lend to projects.

In general, renewable energy projects are characterized by high risk (uncertainty with respect to demand), necessity for long term investments, and can be financed with debt, equity or mezzanine financing. For patient capital, pension funds, private equity and venture capital funds seem to be a good source. Equity would be a good source to finance inventions and innovations while long term debt for financing diffusion.

## Indian Scenario

According to data from Central Electricity Authority website, share of renewable energy installations in Indian power increased from 26% to 29% from the year 2021-22 to 2022-23. As highlighted by Climate Action Tracker, we have to solidify our policies. There are several policy instruments in India to promote Renewable Energy, such as Renewable Purchase Obligation, Feed in Tariff, Renewable Energy Certificates, etc[Chatterjee(2017)].

**Renewable Purchase Obligations (RPO):** This mandates all electricity distribution licensees to purchase or produce a certain amount of their requirements in terms of renewable energy.

**Renewable Energy Certificates (REC):** An incentive to producers of renewable energy where producers who do not enjoy any concessions can register themselves and get an REC for each Mega Watt-hour of power generation.

RECs are tradeable in markets and aid companies in reaching their RPOs. A stream in contemporary literature has focused on how Venture Capital funding has impacted renewable energy project financing. Although on paper, RECs are very convenient to implement and cost of renewable energy generation has come down, they have not been quite the success they are expected to be, owing to distribution companies being locked in thermal power purchase agreements [Sawhney(2022)]. There are incentive schemes in India - accelerated depreciation, generation based incentives and viability gap funding. Accelerated Depreciation is a tax based incentive; Generation Based Incentives an incentive system per kWh of solar and wind generation and Viability Gap Funding is to encourage economically viable projects which fall short of financing. Indian power demand is dominated by residential users. By 2030, India expects renewable energy sources to power 50% of the demand and 500GW of installed capacity. To achieve this and other decarbonization targets set for our country, solar and wind power generation has to be increased. Recently, REC, a state owned infrastructure finance company has expanded its loan book to accommodate a huge chunk of the financing. To improve the collection of dues, it has also implemented a late payment surcharge system.

Coming to the current financing structure in India, non-recourse loans are rare to non-existent. There is at least a limited amount of claim in the loans. Loans, in general, are not long term as well due to asset-liability mismatch problems. In this case, project refinancing is the way out, for which the green bond market is the preferred route. The Framework for Green Bonds in India outlines the principles as (i) Use of proceeds, (ii) Project Evaluation and Selection, (iii) Management of Proceeds, and (iv) Reporting. Projects which encourage reduction in emissions and contribute towards realization of Sustainable Development Goals (SDGs) are classified as green projects. India recently launched its first green bond to raise \$2 billion. The first issue was a hit and was oversubscribed more than four

times and obtained a greenium of about 5-6 basis points, thus reducing the cost of financing. Having issued the bonds in local currency also proves to be advantageous, as the problems of currency exchange and asset liability mismatch can be avoided. Bonds group diverse asset portfolios and hence provide the advantage of tradability, fixed coupon rate and diversification. Equity financing in India is dominated by private equity and pension fund investors.

However, excess interest on de-risked projects leads to less investments in greenfield projects. There is a lot of scope for improvement in this field. Saboo and Srivastava(2022) suggest setting up a dedicated infrastructure bank for this purpose.

Although the tariffs and required rate of return on equity have reduced leading to a boom, the current troubles renewable energy projects face in India are caused by supply chain disruptions brought forth by the pandemic and Ukraine war.

In order to improve the efficiency and returns, Saboo and Srivastava(2022b) suggest hybrid projects of more than one technology, while also using financial engineering innovations for improving returns. This would aid in reaching the sustainability goals set up for India. There has been what van den Heuvel and Popp(2022) call a 'CleanTech bubble'. Gaddy, Sivaram, Jones and Wayman(2017) use publicly available data on cleantech firms and find that cleantech software is an attractive investment while hardware is not. As van den Heuvel and Popp(2022) elaborate on the causes, Venture Capital funds initially invested a huge amount of money in clean energy technologies, but the demand for clean energy was unfortunately not sufficiently high, which led to lot of these companies to perform poorly. The authors highlight the need for a positive demand shock for VC investments in the field to be profitable. Gaddy et al(2017) state the need for public policy intervention, federal policy initiatives to encourage research and innovation. Polzin and Sanders(2020) suggest scaling up of investments based on ESG themes, encouraging investments in terms of human capital, sharing risks with public or semi-public investors, developing innovative financial products by pooling into larger funds to take advantage of economies of scale.

For Venture Capital funds to show more interest in renewable energy investments, the government has to support them by implementing encouraging policies. There must be creation of demand through policies such as carbon pricing. However, in the US setting, it has been shown to be difficult to implement it [van den Heuvel et al(2022)]. The CleanTech boom has also failed because of failure in creation of demand for clean energy. Even from a strategic business perspective, clean energy startups are quite different from Information & Communication Technology startups and do not comprise of the benefits provided by network effects, patents and product differentiation. It is hard to protect incumbents from the threat of competition owing to this, making renewable energy ventures further



more unattractive for private capital. Hence, the onus falls on governments to try and implement demand enhancing policies.

### **Public Policy Initiatives**

As described earlier, renewable energy projects are capital intensive. Arrangements such as offtake arrangements and power purchase agreements fix the price of energy in terms of long term concession agreements. There are tax partners who invest in the project in view of the tax benefits. Apart from this, public policy initiatives are also required in order to incentivize participation of investors in renewable energy projects, especially in developing countries like India.

Rather than renewable energy production being costly, the enticing feature about mainstream energy production is that it is cheaper economically, albeit with externalities like pollution. Hence, one way out can be to tax conventional energy more. Carbon taxes are one such mechanism. However, it is hard to control the amount of emissions with a particular amount of tax, as it is hard to forecast how much amount of tax would restrain how much emissions. According to OECD data, India has a carbon tax base of 34,72,686.80 kilotonnes, compared to a global weighted average of 3,99,54,156 kilotonnes. In India, there is no explicit carbon tax. However, there is a fuel excise tax, covering nearly 55% of the emissions as of 2021. A coal tax has also been introduced which increased the price of coal from INR 50 to 400 per tonne.

A tradable permit system can be used in this context. However, volatility of the prices is a disadvantage. Surat in Gujarat has implemented a cap mechanism on permits. Another point to be noted is that if a particular state or country imposes strict cap on the amount of permits to be used, industries would move to neighbouring countries/states, thus potentially worsening global pollution [Ben-David et al(2018)].

Harstad(2012) suggests a supply side mechanism instead of demand side mechanisms (discussed above). He explains that demand side policies cause countries which do not participate in emission limiting agreements to increase their consumption owing to reduction in demand for and hence the price of the permits. Instead, by purchasing the deposits (of say coal), the countries in the coalition can limit the supply and do not need to fear negative externalities.

Moving to subsidies to renewable energy, production tax credits and investment tax credits are usually implemented for wind and solar energy respectively. In India, although renewable energy investments have increased, the subsidies have dropped considerably from 2017 to 2022, which is a matter of concern, considering its objectives [CEEW, 2022].

Year	Subsidy(in INR Crore)
2017	16312
2018	15111
2019	8352
2020	7550
2021	5774
2022	11529

CEEW suggests introduction of more subsidies for renewable energy along with subsidies on LPG, mandatory diversification of PSUs, increased clean energy lending targets and strategic taxation.

## Conclusions

Renewable energy financing is inherently very complex due to the uncertainties involved. However this does not reduce the necessity of transitioning from conventional energy sources. It is very much necessary to encourage lending as well as equity financing in this sector. Policy initiatives such as tax subsidies, carbon taxes, etc. would also prove beneficial. Government should step in and implement demand enhancing strategies which makes it lucrative for VC funds to pour in private money, which is patient capital and best suitable for renewable energy startups. As highlighted in Climate Action Tracker report, it is important to make the aims of our renewable energy policy less hazy so that it would be easier to understand the capital requirements and take calculated strides to reach the goals. A diversified financial system is the path ahead.

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# An analysis of the volatility of Indian Defence stocks using Bollinger bands

**Sandeep Bhattacharjee**

## **Abstract:**

The existence of a relationship between Stock market fluctuations and the economy of the state, country or region may be interrelated to each other in one way or another. This research paper is an effort to understand the fluctuations or volatility in Indian Defence stocks and how it has propelled the growth of the Indian Defence sector in recent times. Five major companies include Hindustan Aeronautics Limited (HAL), BHARAT ELECTRONICS LTD, Mazagon Dock Shipbuilders Limited, Cochin Shipyard Ltd, Bharat Dynamics Ltd for the period of one year approx. i.e., between 30-12-2021 to 30-01-2023 (272 days of stock trading).

**Keywords:** defence, market, movement, stocks, volatility

## **INTRODUCTION**

A country's growth and development might be related to the volatility of the stocks or group of stocks in its macroeconomy.

First, when a country grows, its production structure shifts from more volatile to less volatile industries. Second, the volatility of country-specific macroeconomic shocks decreases over time. Third, the covariance of sectoral and country-specific shocks does not vary systematically with development level. There is also evidence that the degree of sectoral concentration decreases throughout the early stages of development and rises later on. Many ideas relating to volatility and development, we believe, are inconsistent with these findings, and we propose alternative routes for future theoretical investigation. Another paper (António Afonso, Davide Furceri, 2010) examines the impacts of government revenue and spending on growth in OECD and EU nations in terms of size and volatility. The paper's findings show that both characteristics are harmful to growth. Looking more closely at each component of government revenue and spending, the results show that among indirect taxes (size and volatility) among social contributions (size and volatility);

government consumption (size and volatility); subsidies (size); and government investment (volatility) all have a sizeable, negative, and statistically significant effect on growth.

A new model was developed (Robert F. Engle, Eric Ghysels, Bumjean Sohn, 2019) with a long-term component driven by inflation and industrial output growth that, in terms of pseudo-out-of-sample prediction, are comparable to or exceed more typical time series volatility models over longer time horizons. As a result, including economic fundamentals in volatility models pays dividends in terms of long-term predictions. We also discover that macroeconomic fundamentals have an important effect even over a short period.

When economies are fragile, manufacturers of fighter planes, battleships, and missiles are traditionally one of the finest defensive havens for investors, Geopolitical turmoil and unrest are also crucial components in the attacking arsenal this time around.

When a downturn erodes demand or an external shock rattles the market, the US government budget, particularly military spending, tends to remain constant. When recession worries raise, equities such as Lockheed Martin Corp., Northrop Grumman Corp., and others become more appealing. As the world watches Russia's assault on Ukraine, nations are increasing military spending. Even more concerning is China President Xi Jinping's growing friendship with Russian President Vladimir Putin, which includes Chinese forces participating in joint drills sponsored by Russia. This just adds to concerns over China's recent demonstration of military strength around and above Taiwan during US House Speaker Nancy Pelosi's August visit to the island. That led to an increase in market demand for US war machines which further led to an increase in the market for such defence products.

## **INDIAN INDUSTRY EXISTENCE:**

The Indian defence ministry's budgetary allotment was increased in Budget 2022–23 by 9.8% to \$70.6 billion. There are several factors that led to this surge in defence spending, with geopolitical factors including the standoff with China in Ladakh and the sight of Russian weaponry performing poorly in Ukraine. The latter circumstance taught India three lessons:

1. When it becomes utmost necessary, foreign equipment manufacture and availability may be constrained. Because some of the components for their outdated precision weapons are created in other nations, who are now either unwilling or unable to supply them, the Russians are failing to replace them.
2. The Indian Armed Forces' predominantly Russian-made equipment appears to be ineffective against Western weaponry.

3. Western equipment, while of great quality, is very expensive and difficult to build rapidly in large quantities. As a result, deliveries to Ukraine have been delayed since Western nations are unwilling to provide expensive equipment that is also difficult to replace soon.

It is therefore not surprising that the Indian government has emphasized "Make in India" in the manufacturing of defence. The military ministry just announced the sixth positive indigenization list, which consists of 780 products and would reduce defence imports. To gradually increase their capacity for producing defence goods, Indian businesses (both public and private) are also investing more and more in defence technology (such as drones, armoured vehicles, and rockets).

Top defence stocks that stockholders may be interested in include:

SI No.	Name of the company	Share price change in last 1 year
1	Hindustan Aeronautics Ltd	89.57%
2	Bharat Electronics Ltd	62.17%
3	Bharat Dynamics Ltd	127.92%
4	Mazagon Dock Shipbuilders	156.84%
5	Cochin Shipyard Ltd	65.15%

**Table 1. Top Indian defence stocks**

(Source: <https://www.angelone.in/blog/best-defence-stocks-in-india>)

## **LITERATURE REVIEW:**

The literature review has been divided into two parts to understand some major literature studies for both the stock market Volatility and Defence sector.

### **a. Stock Market Volatility:**

The concept of stock market volatility aids in determining the characteristics of the financial market in current times. Kim HiangLiow (2005) investigated the dynamics of conditional returns, volatility, and systematic risk in 10 emerging and developed real-estate markets, as well as two global market indexes (i.e., world stock and world real estate). He also mentioned how clustering, predictability, strong persistence, and asymmetry in country-specific and global market conditional volatility are important for developing real estate markets, which have higher conditional volatility and persistence than developed markets, and how time-varying real estate betas relative to a world real-estate index over a world stock index may favour time-varying real estate betas. Bo-Young Choi et al. (2017) investigated how exchange rate volatility affects total factor productivity

Indian Institute of Management Calcutta

(TFP) across multiple dimensions. The findings revealed that the negative impacts of volatility on productivity were distributed unevenly among TFP quantiles and formed an inverted W-shape curve. The negative effects were especially obvious for exporting plants with the lowest or highest TFPs. Gabaix Xavier (2005) Excess stock market volatility is a notion in which market swings are caused by trades by very large institutional investors in very illiquid markets. Derivations from such theory reveal these investors' optimal trading behaviour, which provides a cohesive explanation for seemingly disparate empirical regularities in returns, trading volume, and investor size.

Another study by Hashimijoo (2012), looked at the relationship between dividend policy and share price volatility in consumer goods companies listed on the Malaysian stock exchange. The empirical findings of this study revealed a substantial negative association between share price volatility and the two key dividend policy measurements, dividend yield and dividend payout. Furthermore, a significant inverse link between share price volatility and size is discovered. Among predictor variables, dividend yield and size had the greatest impact on share price volatility, according to the findings of this study.

Some segments of stocks may behave similarly as indicated by research by Perlin, and Marcelo (2007), who proposed a multivariate variant of pairs trading in which an artificial pair for a certain stock is created using information from  $m$  assets rather than simply one. The key conclusion of the paper is that for the majority of the parameters, the proposed version outperformed the benchmark returns and random portfolios. Daniel, Kent D. (1997) develop a theory based on investor overconfidence and biased self-attribution to explain many anomalous securities return patterns from the standpoint of efficient markets with rational investors. The first premise says that private information is overreacted to and public information is under-reacted to. This is consistent with (1) stock price 'drift' following business events and earnings announcements, (2) negative long-lag autocorrelations (long-run 'overreaction,' and (3) excess volatility of asset values. When the second assumption is included, there are (4) positive short-lag autocorrelations 'momentum', (5) short-run post-earnings release 'drift,' and a negative correlation between future stock returns and long-term measures of previous accounting performance.

A certain level of difficulties that are raised by high-frequency trading (HFT) was discussed by Charles M Jones (2013), based on an examination of recent theoretical and empirical studies on high-frequency trading (HFT). The researcher also mentioned the regulatory difficulties raised by HFT are the same as those raised by more traditional marketplaces. Now, regulators in the United States are depending on competition to reduce abuses. If there are market failures, additional regulation is required. Consolidated order-level audit trails, for example, are critical to effective enforcement. The need for liberalisation can also be one of the affecting factors that can lead to more investments in the stock market with both pros and cons. Kent Hargis (2000) investigated the effects of various types of foreign investment liberalisation on risk in emerging equities



markets. Some of these liberalisations include the abolition of foreign investment restrictions in the domestic equities market, as well as international cross-listings and closed-end country funds in the United States. Market risk exposure, as assessed by the beta on the global portfolio, rises in Argentina with liberalisation, Chile with an ADR index, and Thailand with increased foreign ownership, diminishing the diversification benefits of these countries.

#### **b. Defence Sector:**

Nicholas W. Barber (2013) conducted research to demonstrate the concerns raised by the separation of powers when the doctrine is powered by a thin political theory, i.e. concepts that are so uncontroversial that almost all political theorists would support them. He discovered several issues, such as weak force, whose significance can be a continuing factor leading to the thicker normative theory being established. Structural difficulties are at the heart of the notion by using thin normative assumptions, even if they are too shallow to allow us to develop a complete model of the division of powers. Robert J. Alexander (1995) investigated the model for which too much has been claimed in some previous work to understand how growth in real non-Defence output is affected rather than growth in real aggregate output (inclusive of military spending) as the dependent variable for a small group of OECD countries. Using only good quality data and non-Defence output as the dependent variable, no evidence in favour of the under-consumption (as opposed to the Defence as a burden) position was identified. SonmezAtesoglu and Michael J. Mueller (1990) established a link between Defence spending and economic growth using an econometric technique based on a two-sector production function model of the economy. The analysis concluded that, except for very substantial sustained cuts, a major reduction in Defence spending should have little impact on US economic development...Sakura Adebola Solarin and Prithish Kumar Sahu (2015) investigated the impact of military spending on stock market development in 36 nations from 1989 to 2010. Overall, the findings indicate that military spending has a negative and considerable impact on stock market performance in the countries studied.

Michael Beenstock (1998) investigated the literature on economic elements of Defence in Israel, which is critically examined by subject measuring the Defence burden, determinants of defence spending, the consequences of Defence spending on the economy, and the military industrial complex.

As derived from the above literature study, we needed to understand how some similar defence stocks in India have behaved in recent times. Further, certain alternate hypotheses were considered:

- a. Stock volatility of major Indian Defence stocks remains less concerning the time factor. ( H1)
- b. Stocks in a similar cluster (Indian Defence cluster) maybe have consistently similar concerning time factor (H2).

## Data collection:

The data needed for comparing and understanding volatility in stocks of five major Indian Defence companies were gathered using Excel functions in Microsoft Excel 365 Enterprise Edition (licensed version).

## Data Analysis:

The data analysis has been conducted on the data fetched using the stock history function in Microsoft Excel 365 enterprise version (licensed version). We have collected data for five significant defence stocks that include Hindustan Aeronautics Limited (HAL), BHARAT ELECTRONICS LTD, Mazagon Dock Shipbuilders Limited, Cochin Shipyard Ltd and Bharat Dynamics Ltd, for the period of one year approx. i.e., between 30-12-2021 to 30-01-2023 (272 days of stock trading). Later, we used the Bollinger band for volatility analysis using the R console version 3.4.0 for all 5 stocks namely HAL, BEL, MAZDOCK, COCHINSHIP and BDL respectively.

The coding of the stocks (as per availability in the stock exchange) were:

COMPANY	STOCK CODE
Hindustan Aeronautics Limited	HAL
BHARAT ELECTRONICS LTD	BEL
Mazagon Dock Shipbuilders Limited	MAZDOCK
Cochin Shipyard Ltd	COCHINSHIP
Bharat Dynamics Ltd	BDL

*Table 2. Five Top Indian Defence Stocks*

(Source: Author analysis)

The formula used for 3 bands in Bollinger band: -

<p><b>Middle Band = 20-day simple moving average (SMA)</b></p> <p><b>Upper Band = 20-day SMA + (20-day standard deviation of price x 2)</b></p> <p><b>Lower Band = 20-day SMA - (20-day standard deviation of price x 2)</b></p>
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*Figure 1. Bollinger bands descriptions*

(Source: Author analysis)

1. Stock volatility and Trade Volume formal

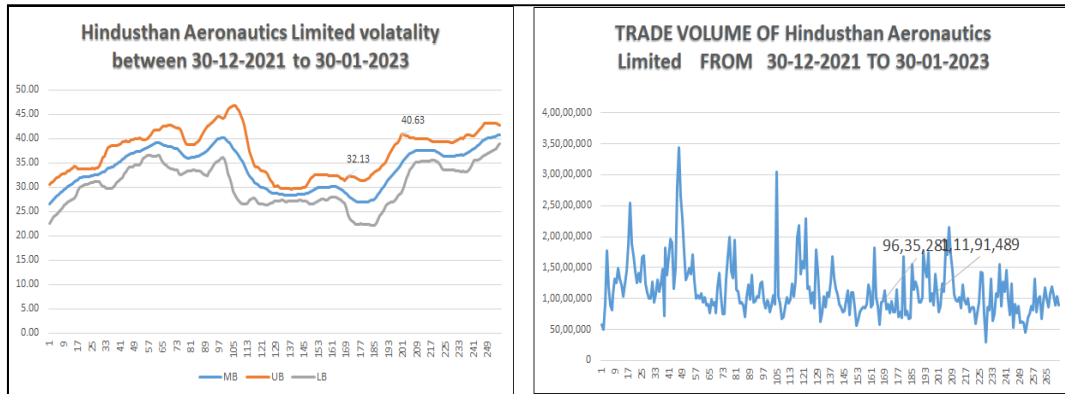


Figure 2. HAL stock volatility using Bollinger Bands and Volume recorded from 30-12-2021 to 30-01-2023

As seen in above figure 2, fluctuations have been seen from the 168th day to the 200th day during which even the stock trading recorded was also very high that fluctuated between 96,35,281 to 1,11,91,489 units.

2. Stock Volatility and Trade Volume for BEL

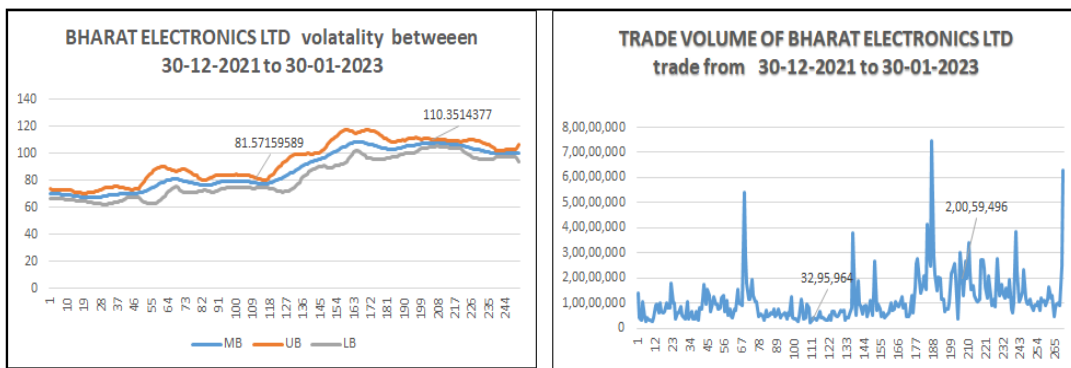
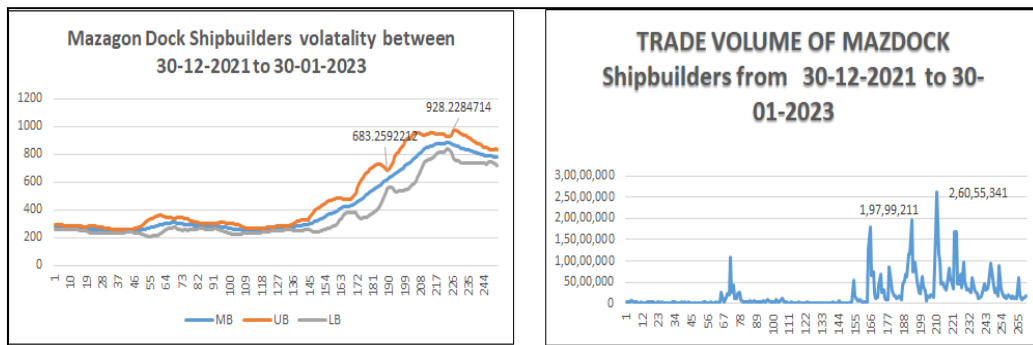


Figure 3. BEL stock volatility using Bollinger Bands and Volume recorded from 30-12-2021 to 30-01-2023

As seen in above figure 3, fluctuations have been seen from the 111th day to the 206th day during which even the stock trading fluctuated between 32,95,964 to 2,00,59,496 units.

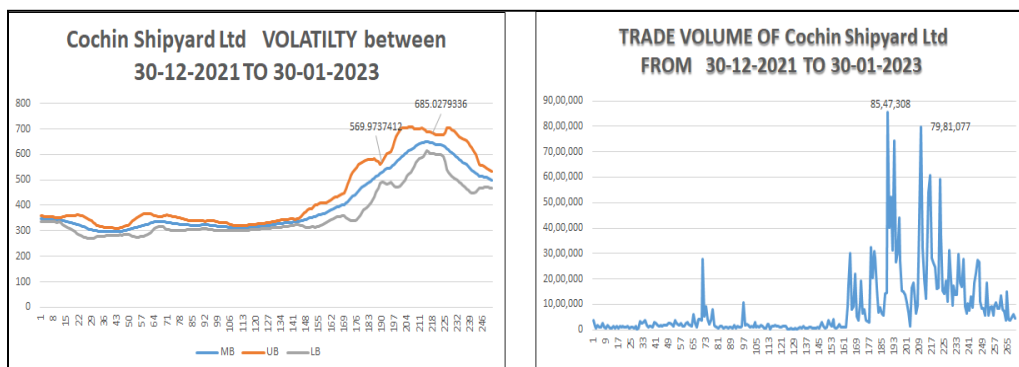
### 3. Stock Volatility and Trade Volume for MAZDOCK



**Figure 4. MAZDOCK stock volatility using Bollinger Bands and Volume recorded from 30-12-2021 to 30-01-2023**

As seen in above figure 4, fluctuations have been seen from the 190th day to the 208th day during which even the stock trading recorded was also very high that fluctuated between 1,97,99,211 to 2,60,55,341 units.

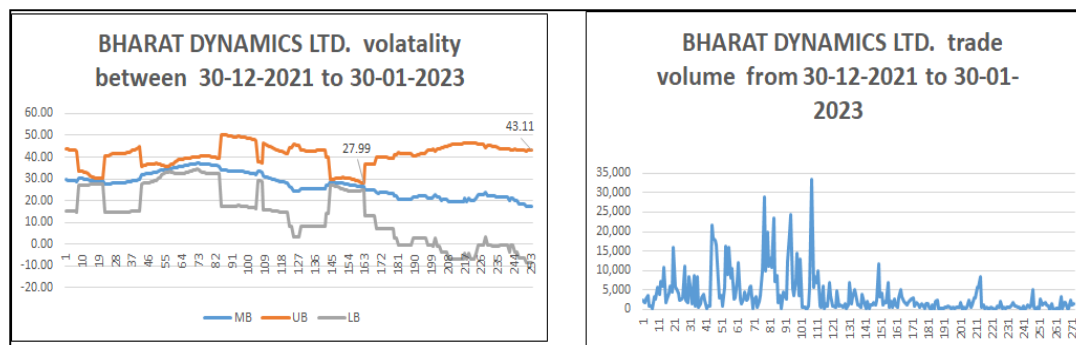
### 4. Stock Volatility and Trade Volume for COCHINSHIP



**Figure 5. COCHINSHIP stock volatility using Bollinger Bands and Volume recorded from 30-12-2021 to 30-01-2023**

As seen in above figure 5, fluctuations have been seen from the 190th day to the 208th day during which even the stock trading recorded was also very high fluctuating at 79,81,077 to 85,47,308 units.

## 5. Stock Volatility and Trade Volume for BDL



**Figure 6. BDL stock volatility using Bollinger Bands and Volume recorded from 30-12-2021 to 30-01-2023**

As seen in above figure 6, fluctuations have been seen from the 160th day to the 253th day during which even the stock trading highly fluctuated between 1203 to 568 units.

### MAJOR FINDINGS:

1. HAL stocks seemed moderately volatile during the period of 30-08-2022 to 14-10-2022 but became consistent later.
2. BEL stocks seemed moderately volatile during the period of 10-06-2022 to 28-10-2022 but became consistent later.
3. MAZDOCK stocks seemed moderately volatile during the period of 04-10-2022 to 01-11-2022 but became consistent later.
4. **COCHINSHIP** stocks seemed moderately volatile during the period of 04-10-2022 to 01-11-2022 but became consistent later.
5. BDL stocks seemed moderately volatile during the period of 18-08-2022 to 19-10-2022 but became consistent later.

Technically, prices are relatively high when above the upper band and relatively low when below the lower band. However, “relatively high” should not be regarded as bearish or as a sell signal. Likewise, “relatively low” should not be considered bullish or as a buy signal. Prices may be high or low for other economic reasons. We can further interpret that the Stock volatility of major Indian defence stocks remains less concerning the time factor. **(H1)**. Also, Stocks in a similar cluster (defence cluster) may behave consistently similarly concerning time factor **(H2)**.

Therefore, both of our hypothesis i.e. **H1, and H2** stands as true and can be considered as a more common phenomenon in the present and future times.

Our research was limited to a given period and based on data collected for 272 days of the above-discussed stock prices. The results might vary if the more or lesser period is considered which another constraint of this research remains. The paper can be used by academicians and policymakers to determine how policies may be restructured or adjusted as per prevailing future expectations of the growth of different economies.

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# Dominance of Automation in Financial Services Industry

Sameer Roy

**Introduction:** - The digital revolution and proliferation of latest technologies have taken the world by storm. The rapid adoption of these emerging technologies confirms that the age of automation is upon us. The financial service sector, typically perceived as a conservative industry, has undergone tremendous evolution over the last few years. Being the kind of industry, which is dominated by labour intensive processes, the banking industry had to lead in welcoming automation solutions.

The financial services industry is undergoing a significant transformation driven by the dominance of automation. Automation, powered by advanced technologies such as artificial intelligence (AI), machine learning (ML), and robotic process automation (RPA), has revolutionized various aspects of the industry, leading to increased efficiency, improved compliance, and enhanced customer experiences.

Automation has become a critical component of the financial services sector, enabling organizations to streamline processes, reduce manual intervention, and optimize operations. Tasks that were once time-consuming and prone to human error can now be automated, allowing financial institutions to allocate resources more strategically and focus on higher-value activities.

**How does automation deliver operation efficiency, regulatory compliance and better customer experiences?**

- a) **Efficiency** - Automation has streamlined numerous financial processes, such as account opening, transaction processing, and report generation. Tasks that were once manual and time-consuming can now be automated, reducing human error and speeding up operations. For example, automated transaction reconciliations and settlements enable faster and more accurate processing, leading to increased operational efficiency.
- b) **Compliance** - The financial industry is heavily regulated, and automation has greatly aided compliance efforts. Automated systems can track and monitor transactions, flag suspicious activities, and generate reports required by regulatory bodies. This ensures adherence to regulations such as anti-money

laundering (AML) and Know Your Customer (KYC) requirements. Automation also helps in updating systems to reflect changing regulations promptly, reducing compliance-related risks

- c) **Customer experiences** - Automation has transformed customer experiences in the financial industry. Chatbots and virtual assistants provide instant support, answering frequently asked questions and guiding customers through various processes. Automated account management systems allow customers to access their accounts, make transactions, and view statements at their convenience. This self-service capability enhances convenience and improves customer satisfaction.
- d) **Risk management** - Automation plays a crucial role in risk management by continuously monitoring and analyzing financial data. Automated risk assessment tools can detect anomalies, identify potential fraud or security breaches, and alert relevant stakeholders. This proactive risk management approach minimizes financial losses and protects both institutions and customers.
- e) **Data analysis and insights**: Automation tools can analyze vast amounts of financial data quickly, providing valuable insights for decision-making. This enables financial institutions to identify patterns, trends, and customer preferences, leading to more targeted marketing strategies and personalized offerings. Automated data analysis also aids in fraud detection, credit scoring, and investment decision-making.

### **Real Use Cases: Illustrating the Power of Automation**

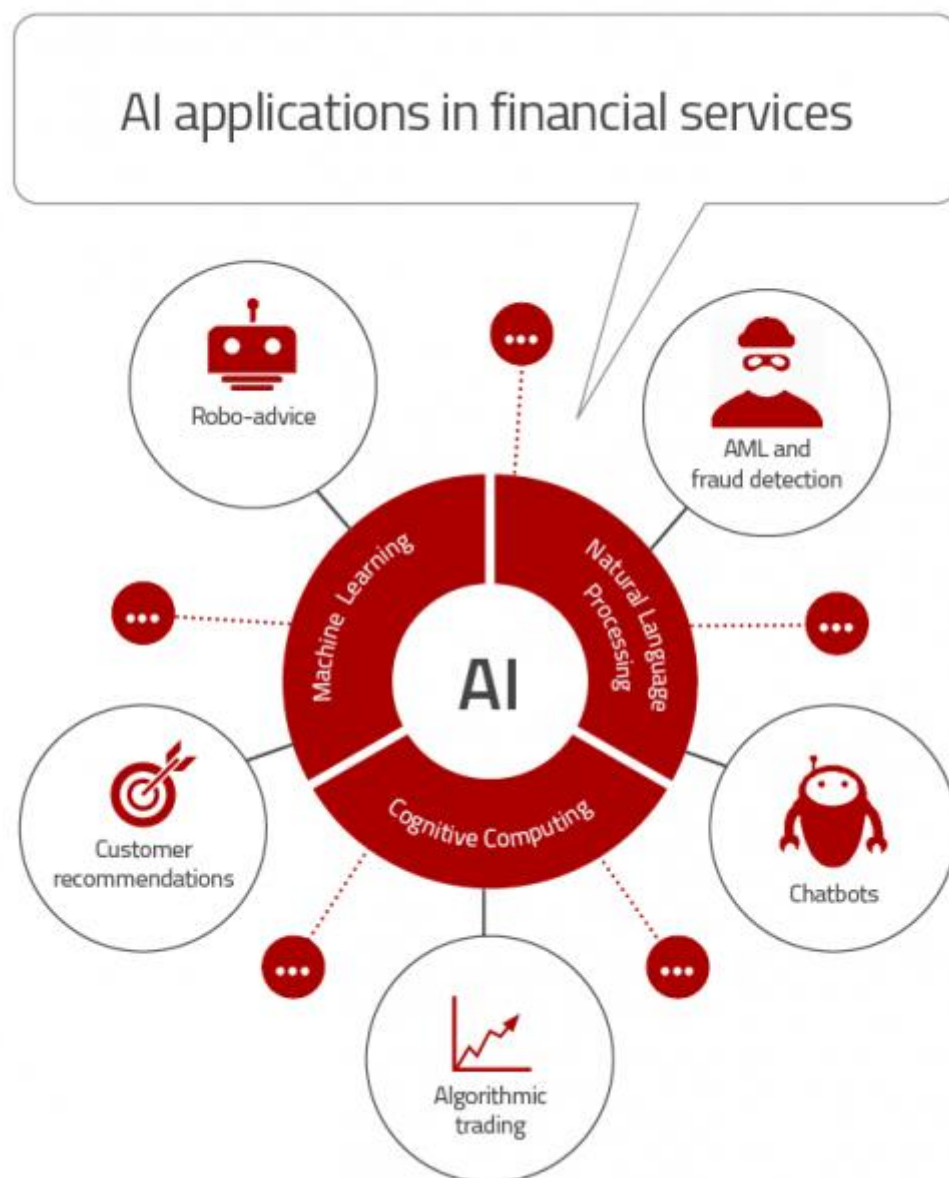
One real use case that demonstrates how automation has transformed various aspects of the financial services industry is in the area of customer service and support. Many financial institutions have implemented chatbot technology to automate and enhance their customer service processes.

Traditionally, customer service in the financial industry involved phone calls or in-person visits, which could result in long wait times and limited availability. With the introduction of chatbots, customers now have 24/7 access to support and can receive immediate responses to their queries.

Chatbots use natural language processing and artificial intelligence algorithms to understand customer inquiries and provide relevant information or assistance. They can handle a wide range of customer interactions, including answering frequently asked questions, providing account balance information, guiding users through the application process, and even offering basic financial advice.

Additionally, automation has played a transformative role in fraud detection and prevention. Machine learning algorithms can analyze large volumes of financial data, identify patterns, and flag potentially fraudulent activities. This enables financial institutions to detect and respond to fraud more quickly and accurately, minimizing financial losses and protecting customers.

In investment advisory, automation has revolutionized the industry through robo-advisors. These digital platforms leverage algorithms and data analysis to provide personalized investment advice and portfolio management. Robo-advisors can assess a client's risk profile, investment goals, and market conditions to offer tailored investment recommendations at a lower cost compared to traditional human advisors.



Overall, automation in customer service, fraud detection, and investment advisory has transformed the financial services industry by improving accessibility, efficiency, personalization, and cost-effectiveness.

### **Statistics on how AI will impact the financial industry**

As per latest report AI is expected to impact the financial industry.

**Cost savings:** According to a report by Autonomous, AI technology has the potential to generate cost savings of up to \$1 trillion for the financial industry by 2030. Automation of manual processes and increased operational efficiency are expected to contribute to these savings.

**Enhanced customer experiences:** Research by Capgemini suggests that 80% of financial institutions believe AI will revolutionize the way they interact with customers. AI-powered chatbots, personalized recommendations, and virtual assistants can provide faster, more accurate, and tailored customer experiences.

**Fraud detection and prevention:** AI is playing a significant role in fraud detection and prevention in the financial sector. According to a study by Juniper Research, AI-powered systems are expected to save the banking industry \$22 billion by 2023 by reducing fraudulent activities.

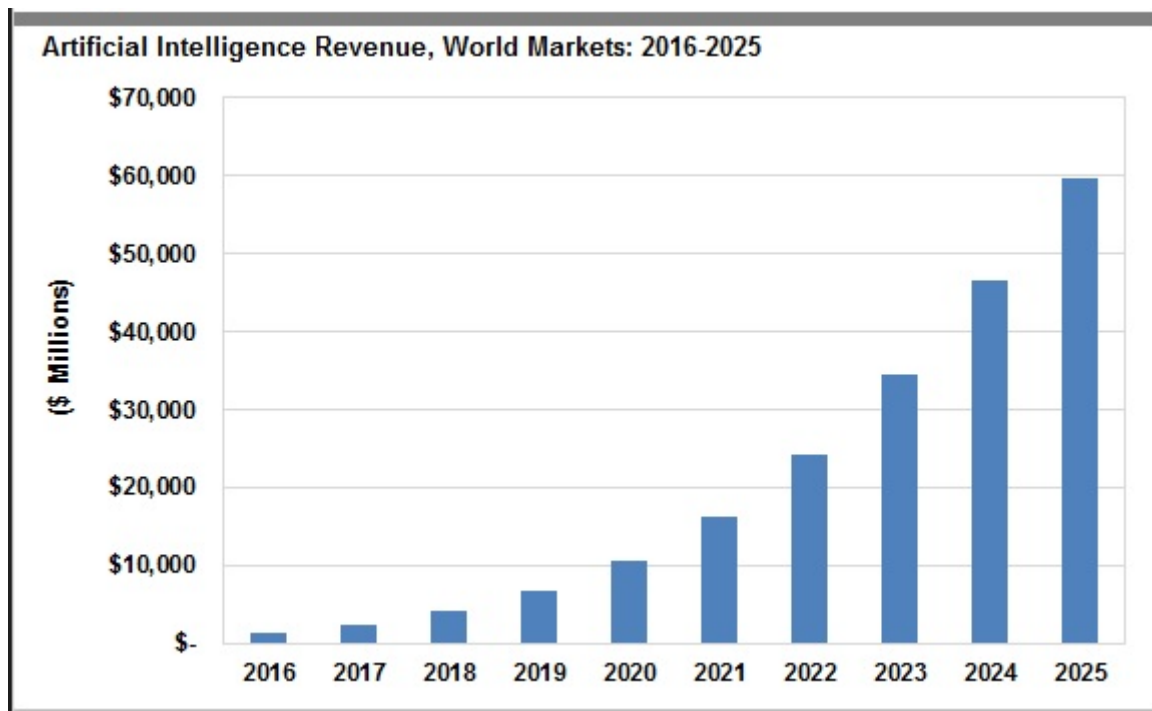
**Improved risk management:** AI algorithms can analyze vast amounts of data to identify patterns and anomalies, enhancing risk management practices. By automating risk assessment processes, financial institutions can make more informed decisions and mitigate potential risks.

**Investment advisory and wealth management:** The use of AI in investment advisory and wealth management is growing. A PwC report predicts that AI-driven robo-advisory platforms will manage around \$16 trillion in assets by 2025, highlighting the increasing adoption of AI in investment decision-making.

**Automation of back-office processes:** AI technologies like robotic process automation (RPA) can automate repetitive and time-consuming back-office tasks such as data entry, document processing, and compliance checks. This can lead to significant time and cost savings for financial institutions.

**Fintech Market:** The global AI fintech market is predicted to reach \$22.6B in 2025, achieving a Compound Annual Growth Rate (CAGR) of 23.37% between 2020 and 2025 according to Mordor Intelligence.

With the availability of technologies such as AI, data has become the most valuable asset in a financial services organization. Now more than ever, banks are aware of the innovative and cost-efficient solutions AI provides, and understand that asset size, although important, will no longer be sufficient on its own to build a successful business.



Estimate revenue projections for the financial industry by 2025

**Some common challenges on adoption of AI in the financial industry and potential mitigation strategies:**

- 1) **Data quality and bias:** AI algorithms heavily rely on data, and if the data used to train these algorithms is of poor quality or biased, it can lead to inaccurate results and unfair outcomes. Mitigation strategies include ensuring high-quality and diverse training data, implementing data validation processes, and conducting regular audits to identify and mitigate bias.
- 2) **Security and privacy:** AI systems in the financial industry deal with sensitive customer data, making security and privacy crucial concerns. Mitigation measures involve implementing robust security protocols, encrypting data, restricting access to authorized personnel, and complying with relevant data protection regulations such as GDPR.
- 3) **Regulatory compliance:** The financial industry is subject to various regulations and compliance requirements. Implementing AI systems that adhere to these regulations can be challenging. Organizations should work closely with legal and compliance teams to ensure AI models comply with relevant laws, establish transparency and explain ability, and conduct regular audits to verify compliance.
- 4) **Explain ability and transparency:** Many AI models, such as deep learning algorithms, are considered black boxes, making it difficult to explain the reasoning behind their decisions. Addressing this challenge involves using interpretable AI models, developing explain ability techniques, and ensuring transparency in decision-making processes to gain the trust of customers, regulators, and stakeholders.

- 5) Ethical considerations: AI systems can inadvertently perpetuate existing biases, discriminate against certain groups, or infringe on ethical principles. Organizations should establish clear ethical guidelines and conduct regular ethical reviews of their AI systems. Fairness assessments, bias monitoring, and ethical training of AI developers and users are crucial mitigation strategies.
- 6) Human-AI collaboration: Integrating AI into existing workflows and ensuring effective collaboration between AI systems and human employees is essential. Organizations should focus on providing training to employees to understand AI technologies, promoting a culture of AI acceptance, and creating mechanisms for human oversight of AI decisions.
- 7) Operational risks: AI systems can introduce new operational risks, including system failures, incorrect predictions, or malicious attacks. Robust risk management strategies should be implemented, including continuous monitoring, regular testing, backup systems, and disaster recovery plans to mitigate these risks.

Addressing these challenges requires a comprehensive and holistic approach, involving collaboration between technology experts, legal and compliance teams, and business stakeholders. Regular monitoring, auditing, and adapting to evolving risks and regulatory changes are essential to ensure the responsible and effective deployment of AI in the financial industry.

### **Conclusion: -**

In conclusion, the automation of the financial industry has brought significant advancements and benefits. Automation has improved efficiency by streamlining processes, reducing manual errors, and accelerating operations. It has also enhanced compliance efforts through automated monitoring, reporting, and adherence to regulatory requirements.

Moreover, automation has transformed customer experiences by providing personalized and seamless interactions, enabling self-service capabilities, and delivering faster and more accurate support. Automation has also improved risk management practices by leveraging data analysis and AI algorithms to detect anomalies, identify potential fraud, and enhance decision-making.

While there are challenges and risks associated with automation, such as data quality, security, and ethical considerations, organizations are actively working on mitigating these risks through robust strategies, transparency, and responsible implementation.



Looking ahead, the financial industry is expected to witness further transformation driven by ongoing digitalization, open banking initiatives, fintech innovation, and increased emphasis on personalization and sustainability. The integration of AI and automation will continue to play a vital role in shaping the future of the financial industry, enabling organizations to adapt to changing customer expectations, regulatory landscapes, and market dynamics.

Ultimately, the automation of the financial industry offers opportunities for improved operational efficiency, enhanced customer experiences, and more effective risk management, paving the way for a more digitized, inclusive, and technologically advanced financial ecosystem.

The dominance of automation in the financial services industry is reshaping business models and creating new opportunities. It enables financial institutions to adapt to evolving customer expectations, regulatory landscapes, and market dynamics. However, as with any technological advancement, challenges such as data privacy, ethical considerations, and human-AI collaboration must be carefully addressed to ensure responsible and effective implementation.

Overall, the dominance of automation in the financial services industry is driving efficiency gains, improving compliance efforts, and enhancing customer experiences. Financial institutions that embrace automation and leverage its power are well-positioned to thrive in the increasingly digital and competitive landscape of the financial services industry.

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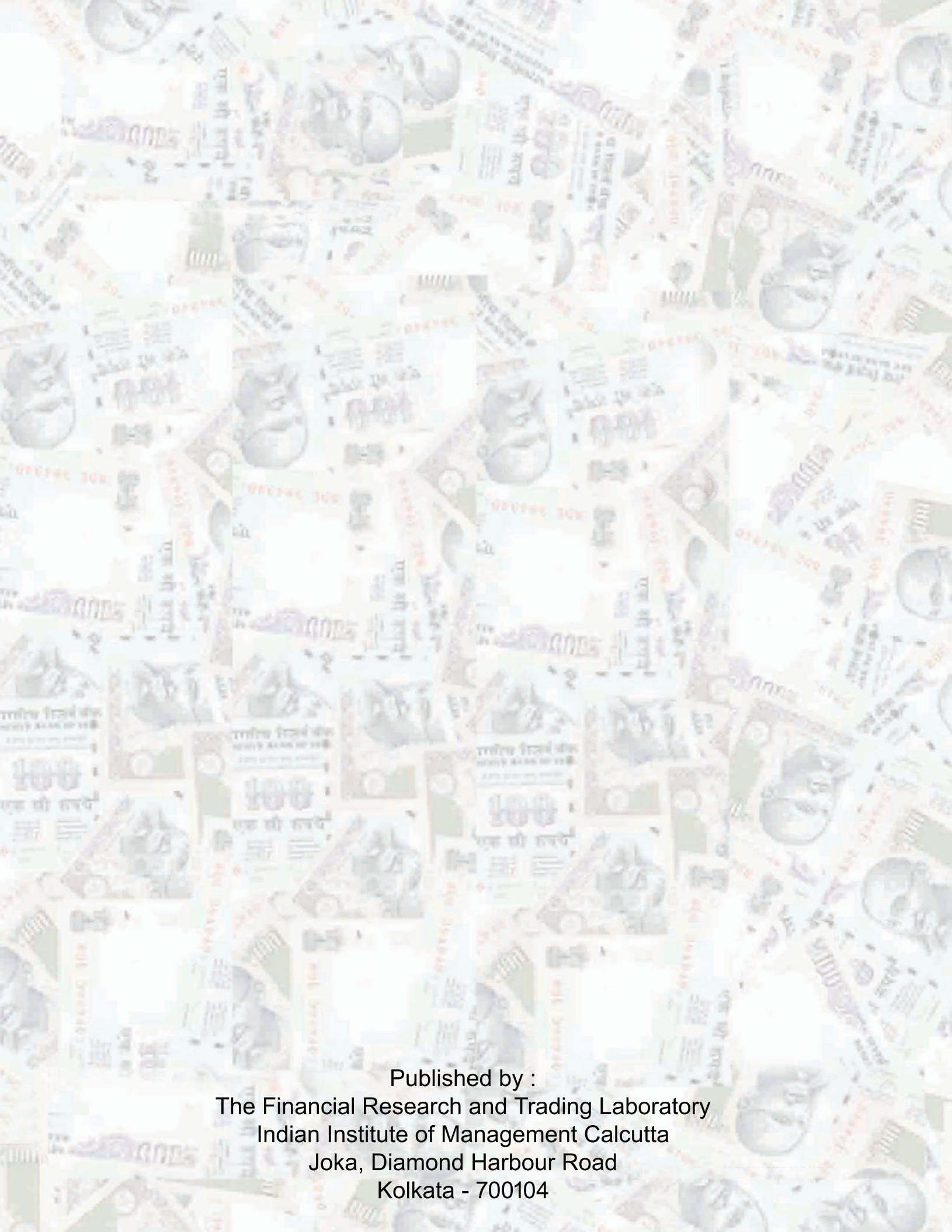
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